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Volume VIII, Number 1, Issue 29

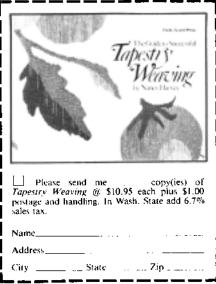
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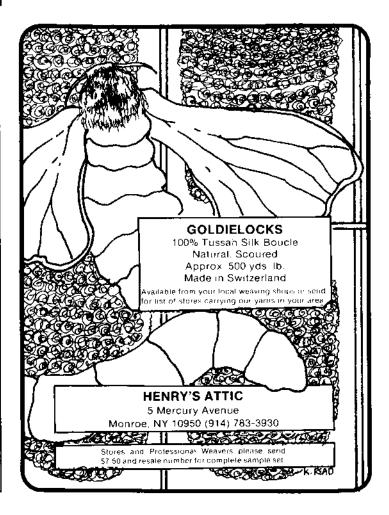
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Summer 1983

Volume VIII, Number 1, Issue 29

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Cover photo: Ethnic and historical textiles are a source of inspiration for contemporary textile artists. Pictured is a Norwegian Aklae: photo courtesy of Vesterheim Norwegian-American Museum, Decorah, Iowa, (See more aklae, p. 27.)

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LETTER FROM THE EDITOR

We have devoted quite a few issues of *The Weaver's Journal* to "how projects are woven". This issue, on the importance of historical and ethnic textiles, puts more emphasis on "why are people weaving?" One wonders what inspires and motivates human beings to spend hours at their looms, interlacing fibers to create textiles. Yet, this process has been going on for thousands of years and will be a characteristic of mankind for years to come.

Surely, our ancestors needed to produce cloth in order to protect themselves against weather, but this is not enough to explain all the beauty and the tremendous amount of technical skill that we admire so much in ancient textiles.

What motivates many weavers today is their cultural heritage. Traditions are handed down; techniques and patterns play such intrinsic roles in certain cultures that craftspeople have acquired an inner drive to continue doing what their ancestors did. For them, it is a way of life and way of sustaining livelihood.

However, for most of us, especially Westerners, our cultural traditions have been obliterated many years ago. Migrations of people, wars, trade routes, the advent of the industrial revolution, have left us with very little cultural tradition but, instead, have made us into strong individuals who are forever searching in the past and learning about the traditions of others. Gradually we acquire a deep sensitivity toward the textiles that we admire, and we reinterpret these feelings into statements which are the textile forms of today.

The contributors to this issue write about their personal quests for their reason for their involvement with textiles. Shereen LaPlantz makes baskets and is aware of her inspiration on the conscious and unconscious level, yet her work has a strong individuality of its own. Farrell Hannon has studied Indonesian ikats and in this issue she writes about the warp ikats from Sumba. However, she also describes the technical problems (and solutions) of weaving curtains which she designed after assimilating a vast knowledge of ikat techniques but yet can be woven on a regular floor loom. Nancy Hillenburg and Mary Elva Erf have researched the textiles produced by the Shakers from the time they settled in the United States. This search into the past and into tradition has been very important to the cloth that rolls off their own looms today. Ulla Nass has found inspiration in the techniques practiced in ancient Peru as well as in their unique pattern systems in which design elements play the dual role of pattern and background. Betty Atwood has recognized the great importance of archaeological digs in the Southwest United States which show that the Anasazi had the knowledge to create intricate twill patterning. Philis Alvic reflects on the pattern weaving of the past, including Colonial coverlets. These patterns are a constant inspiration for her colorful wallhangings which she weaves in Summer and Winter, an ancient weave that is given a very contemporary interpretation.

Cheryl Samuel and Noël Bennett have had to do a great deal of soul searching and make very personal decisions because they are so closely involved with the techniques and the aesthetic statements of North American Indian tribes from which they have no parentage. Both have great respect for ethnic traditions.

As weavers search for beauty in the textiles of the past some patterning, some techniques, will speak to them louder than others. They learn to listen, to uncover special secrets, to absorb the subtleness of

weaves. Finally they are able to use weave structures of old and historic textiles and adapt them to the equipment and working conditions available to us today.

Connie LaLena has found in the age-old damask technique a way to express her visions about Western landscapes.

Margot Schevill writes about her dual exposure to the learning process of becoming a weaver: one in Guatemala, the other at the Saunderstown Textile School in Rhode Island.

The inspiration for a particular woven piece may often be found in a ritual or a myth. In either case, symbolism becomes an important element to convey the message which the woven cloth holds within itself. Nancy Harvey writes about a special project in which the ecclesiastical function of the piece had a great impact upon the design.

Finally, Beverly Gordon helps all of us to find in museums what we are looking for. Repeated trips to museums and quests into the history of textiles and into the cultural traditions of other weavers are most likely to reveal to us the answer to the question "why are we weaving?".

Another way to discover the true meaning of a cultural heritage is to study abroad. For those who choose Japan, LaVonne Schrieber has contributed a very comprehensive article about learning Japanese traditional weaving.

Some of the authors mentioned above give technical data about the weaving they have researched and about their own work which resulted from the study. Sonja Irlbeck's article is mostly technical and describes the processes involved in reproducing very traditional Nordic tapestries called AKLAE. The reader is encouraged to weave a sampler as an introduc-



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tion to the mastery of this tapestry technique which is done on a floor

Linda Knutson has contributed to this issue by writing a technical article on dyeing. She uses fiberreactive dyes to produce yarns and cloth with the now popular space dyed patterns.

This issue of The Weaver's Journal also contains two articles aimed at improving the technical skills of fabric designers. The pattern elements are taken from traditional overshot weaves. The weave structures, however, are double weave and complementary weft plain weave. The articles show how one weave structure can be derived from another. This process leads into the discovery that one can weave certain 4-block patterns in a 4-shaft double weave weave struc-

Part II of our initiation of weavers into computers may sound a little bit too technical for some. However, it is an important concept and worth a little extra effort if one hopes to be able to adapt weaving programs to the particular system that one has purchased.

Finally, we are continuing our efforts to establish a vocabulary and draft system that is acceptable to all handweavers. The response to the question "shall we adopt the word harness or shaft?" had some surprises. We honestly thought that we would get more letters in favor of "harness," yet the word "shaft" won out by a narrow margin. We did appreciate all the letters and comments and are publishing most of them in "Mailbag". Please come through again: this time read the article "Let's Pull Together" and let us hear from you how you feel about it.

One last request. I am currently very interested in velvets: those that can be woven on a handloom. If anyone shares the fascination

for this weave structure with me. please let me know. It may very well lead to an issue of The Weaver's Journal in which velvets become the main feature.

Cotilde_

P.S. An address that might be important to those who are very interested in ancient textiles and might want to join CIETA (Centre Internationale des Etudes des Textiles Anciens), 34 rue de la Charité, 69002 Lyons, FRANCE. Their next general assembly is Monday, Sept. 19, 1983. The proceedings of this meeting, mostly in English, are sent to their members and contain papers that are of special interest to those interested in old textiles or unusual ethnic techniques.

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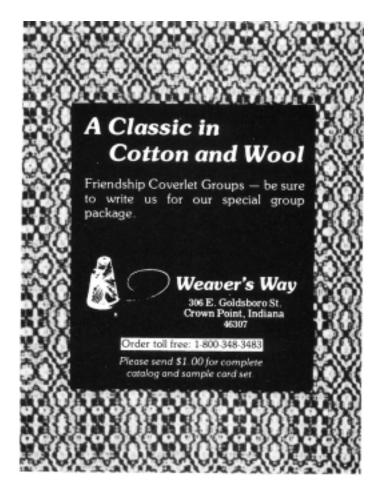
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SIZE, [warp]... VIEW LEVEL 2



and SPACING [weft] VIEW LEVEL 3



threads. Insert warp or weft



threads. Fill in warp or well



threads. Erase warp or weft







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MAIL BAG

When looking at handwoven garments. I have often thought to myself, "It's too bad more weavers aren't better sewers." I'm referring to the picture of the garment on page 32 of the Winter issue. Proper finishing of this garment requires a snap or hook and eye at the neckline of the underpanel so that it is held up where it belongs and doesn't drag down the collar. It is a beautiful garment and it is a shame that this finishing detail was omitted because it causes the top to hang poorly and so offends the eye.

Perhaps you could do an article on tailoring techniques for hand-weavers.

Paula T. Ferraner Clark, N.Y.

Ed: We hope to have such an article soon.

On behalf of the ladies of Daugavas Vanadzes. I would like to thank you for the surprise and thrill it gave us, upon receiving The Weaver's Journal. Volume VII, Number 3, Issue 27, to find in the Book Review section a marvelous write-up of our book "Latvian Sashes. Belts and Bands." It was months and months of hard work. Especially for Mrs. L. Treimanis, who did all the drawings and weaving samples. Also Mrs. A. Dzervitis who donated her material, advice and time (her age late 80s)

Mrs. A. Jakobson Toronto, Canada

When I am threading an intricate pattern, I mark each pattern with a safety pin clipped on the harness. This is helpful when searching for a possible threading error

Sally Bastedo Kitchner, Ont., Canada Many thanks for the computer articles you are printing. Special thanks to you and Sally Swantz for her Weavcat I on the Apple (TWJ, Fall 1982, p.68)

Being a new owner of an Apple II, but abysmally ignorant concerning computer language and programming, I really appreciated being able to key in her index program. And wonder of wonders-it works. For several years I have indexed the magazines on cards, as the printed indexes seem inadequate (I am a retired librarian, as you might have guessed). I am now in the process of transferring these indexes to the computer. Especially appreciated is the ability to add, after the reference, additional subjects, making the references much more useful.

I wonder if any of your readers has a good material inventory program (for the Apple) they would be willing to share with those of us who are struggling to learn programming.

I will look forward to more complete programs in the future, and hope someday to be able to share one of my own with your readers.

Aris Piper Forest Grove, OR

I am a new subscriber to your magazine, and I think that it is very professional. It has so much to offer AND INSPIRE! I am Europeanborn and I like clarity and precision!

Ruth M. Renzema Albany, N.Y.

I do enjoy my Weaver's Journal and I write the same as I did after the first issue. Keep up the scholarly approach. I love it.

> Mary Black El Granada, CA

In future issues I would like to see garment problem sloving for the 'mature' figure. Also home ideas for wool storage, yarn keeping, inventories? Could even include the multitude of accessories a weaver accumulates.

My husband and I have moved to a condominium and the second bedroom, including sleep sofa, is my 'studio.' It is easy to store away items not needed at the moment, but would rather not. Any suggestions?"

Barbara Roberts Olympia, WA

ED: These are good suggestions for articles and we will certainly keep them in mind. Do any of you readers have suggestions for solving the storage problems most weavers seem to have?

I have just recently started reading your magazine after stopping subscriptions to several other weaving publications and have decided that yours is the one I want to continue. Thanks for a wonderful reading experience.

Judy Williams Largo, FL

My thoughts on handweaving? I belong to the old school and believe that the old definition of a woven fabric is still valid-with certain exceptions I mean the definition: "A woven fabric consists of two systems of parallel threads, crossing at right angles and interlinked according to fixed rules called weaves." Today one exception is triaxial weaving where 3 systems of parallel threads interlink at 120 degree angles and another exception is the casement cloth that is handwoven with a reed not set in the beater but loose, where fillingbands stand at odd angles against the warp.

Walter Hausner Hackensack, NJ

Two issues ago you promised more coverage for Beginning Weavers. What happened?

E. S. Oppenheim Sulphur Springs, TX

Ed: For a time, we considered a "For Beginners" column in The Weaver's Journal. However, we abandoned the idea because we found we could not put articles into the slots of being for beginner, medium or advanced weavers. What is a beginner, anyway? The term is a very relative one, since we each come to weaving with different backgrounds and skills.

This does not mean we have forgotten beginners. We still keep the beginner in mind with articles like 'How to Thread a Loom' (TWJ, April 1983) and with our insistence that all weaving instructions be clear and concise.

I am curious about a device described in an article on pg. 45 of the Winter issue of The Weaver's Journal, the Glimakra long-eyed heddle accessory. Since I am very new at this weaving business and have a lot to learn, is this something that could be used for "shaft switching" as used by Peter Collingwood? Or perhaps these are two entirely different things.

Wawanna Petkelis Laguna Miguel, CA

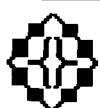
Ed: Many articles on shaft-switching have been published in The Weaver's Journal. The function of shaft-switching is to change the threading while the warp is on the loom. Long-eyed heddles do not perform that function and there is no relation between shaft-switching and long-eyed heddles.



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THE HARNESS RACE

Ed: In the Winter 1982-83 issue of The Weaver's Journal, we made an appeal to our readers for an opinion as to whether we should use the word harness or shaft when we refer to a heddle frame. The problem has obviously been nagging many weavers, teachers and writers, because the response from our readers came in "en force," and we were delighted with their involvement. The responses were so interesting that we decided to print most of them. We hope there will be more letters on the subject in our next issue, too. The race is close, but, as we go to press, shaft is in the lead.

I use the word "shaft," If you use "harness" to refer to a "shaft," then you cannot speak coherently about draw loom weaving, as you Ed Oppenheimer know. Santa Fe, N.M.

In the U.S. and Canada, the term "harness" is used, erroneously, to denote the heddle-carrying device on a loom. Everywhere else in the world and in every other language the correct term "shaft" is used. I would like to see a return to the correct and more universal term. Personally, I hadn't been weaving very long before I realized that "shaft" made more sense and changed my vocabulary. Frequently one sees magazine articles where harness is used for shaft as well as for harness, as when discussing Collingwood's shaft-switching technique or twoharness techniques. Many of these articles are virtually incomprehensible as a result. With the increasing popularity of these techniques as well as increasing use of Scandinavian looms and techniques, this confusion in terminology will become more obvious and irritating. Someone has to attempt to clarify the language.

Jo Swallow Vancouver, Canada

Harness is the word we prefer here at Spin 'n Weave. Joan Ruane Tucson, AZ

I prefer to use the word harness instead of shaft. Marilyn Kegg Huber Hts., OH

I vote for Harness. Rippelton Chapel Hill, N.C.

I prefer shaft. Susan Gustafson Poplar, WI

I prefer the use of the word harness. Probably because I first learned that word and later realized that shaft was the appropriate word also. I have only been spinning and weaving since 6/81 so ! am still confused sometimes by the largon.

Nancy Martin Big Spring, TX I feel strongly about the use of "harness" and "shaft." I think we in the United States should start using the proper terminology. So, I hope your readers will convince you that we should change our usage of the word "harness" to shaft where it is applicable. In the more complex weaves this should be a necessity. If you make this change in The Weaver's Journal, perhaps I can persuade HGA to go along with it-which I have been trying to do.

Marian Hoskinson President, Handweavers Guild of America

Please, shaft is an honest word in the weavers language. It is important that weavers have an accurate way to communicate with each other. I thought you were brave to attempt to get this usage correct and I tried to make use of it too. Now, after a year (?), shaft brings a clear image to my mind.

> Claudie Anderson E. Helena, MT

I'd like to voice my choice. I favor harness and I thank you for the opportunity to express my opin-

> **Harriet Johnson** Bemis Point, N.Y.

Please enter my vote for shaft, even though it has slang connotations, it is the better word.

William Koepp Bakersfield, CA

I favor the word harness.

Sally Bastedo Kitchener, Ont., Canada

In regards to your survey as to which term-shaft or harnessshould be used, I would like to vote for harness. It seems to be used most frequently in other publications, and I feel that standardization of terms makes it easier for weavers to use the various publications in our field. That is just another

> Sue Black Bridgton, ME

I'm writing to you to say that I prefer the word SHAFT

Mary Williams Mt. Nelson, Tasmania

I favor the word harness.

Margaret Looney Cambria, CA

Unless all North American weaving publications changed to "shaft". I think The Weaver's Journal should stick to harness. When I read a European book II expect to come across different terms. Wouldn't it be nice if weaving terms could be standardized world wide! (Like metric)

Ruth Jarvis

Deep River, Ont., Canada

WHAT'S IN A NAME? This is in reply to your request to decide whether to use the term "harness" or "shaft." Only the "Weaver's Journal" which tries to be as correct as possible would even raise the question. Let us first consider the entire confusing problem and try to establish a basis for the use of terms. So-What's in a name?

Well maybe a name is the wrong word. We really want to use a word or phrase to identify a thing, system, action, etc. to other people so that we do not have to give a lengthy and detailed description.

We should use the terms in common use in the USA and that are in the basic American books that have been accepted over the years even if it takes a few more words We should not try to force strange terminology, foreign words or invent names. Since some good books (mostly British) are available that use different terms, we can keep readers informed of the differences. This would expand their understanding and enable them to advance more rapidly if they care to do so. Let us try an example.

An article was published giving a twill design based on a mathematical formula and using a new name for this type of design. Since this twill could have also been developed in a customary manner and did not really give a new effect, there was no need for a new name.

Foreign terms are frequently mentioned without giving details. Opphamta is an example. Just try to find out what it is. Cyrus is the only book in English that I know to go to and it is not there. Cyrus does show "Upphamta." How do I know if it is the same? No foreign term should be mentioned without either complete details or reference to a readily available book or monograph in English. If there is an equivalent American term it should also be referenced.

Some terms need to have more exposure. Couper is one of these. This word has been used in the British area from Murphy (1827) to Tovey (1975). This is what we may call the top levers on a counter march loom. We could refer to them thus: top levers (coupers).

If you are in at least general agreement with my previous statements, the answer to your question is to use "harness." This term is probably familiar to all of your readers and has been accepted in America in both popular and commercial books for many years. You could occasionally write "harness (shaft)" for the education of your readers in USA and for clarification to your foreign subscribers. The exception would be if you had an article on the draw foom or similar type of complex foom where the term "harness" has a different meaning. You should use "shaft" if you are addressing a group of advanced complex weavers.

It would take a complete article to cover the history of the terms used for the devices to raise and/or lower the warp threads. It is interesting to note that I made a check on the books that I have and found that the British did not seem to use the term "shaft" alone without other words such as "heald shaft" until the 1900's. In the USA the term "harness" for the same thing was in common use at least as early as 1880.

So-"What's in a name"? Simply, it must be understood by almost all the persons you are addressing.

Jim Poulton Columbus, IN 47201

I am one of the strongest supporters of the correct work "shaft." After coming to this country, I nicely got used to using "harness." Writing the Augstadt book with Ruth Holroyd and in it using the word "shaft" consistently did not change my habit regarding harness at all. But when you declared in The Weaver's Journal: from now on it's only "shaft," I forced myself to getting used to the word "shaft." I believe all of our guild members are used to learning and reading "shaft," for our newsletter editor also uses only "shaft." I figure in a few years they all will be using it just as easily as I do. It definitely is the correct word, therefore you should not go back to "harness." question should be: how do we get all other fiber magazines to use the correct word at all times? It does bother me reading "harness" where it should be "shaft." All weavers should learn the correct meaning of "harness." as you pointed out in your editorial lett.

Here is my strongest vote possible for SHAFT.

> Ulrike L. Beck Grand Island, NY

Finally, I favor the word harness. Jane Merryman Petaluma, CA

Responding to your editorial letter in the Winter 1982/83 issue of The Weaver's Journal we members and friends of the Weavers' Guild of Buffalo favor the word SHAFT.

> Irene Cuthbert Alice Bunnell **Elizabeth Prost Evelyn Pirson** (and 22 other members)

10

I truly, down deep, prefer "harness," probably because I grew up with the term. It could be rationalized by that old dictionary maxim: Usage makes it so! Susan Hick Englewood, CO

Yes, I'd like to vote on the issue of harness/shaft. I thought it might be interesting to research the development of the use of the two terms in literature . . . lam enclosing the references I found.

Apparently, as far back as the late 19th century, harness became the accepted term used in commercial weaving texts in the United States (Posselt), However, if you go back far enough "leaf" seems to be the term used in Britain before the development of the Jacquard looms confused the issue and introduced the terms "harness" and "shaft" in an entirely different context. As with most of our language, use eventually prevails and now I don't think "shaft" is the correct word in the United States and certainly is not the preferred term in the U.S. Textile Dictionaries or by the manufacturers of looms. (Frost just got a letter from Robert Leclerc, the largest loom manufacturer in the world, and he was discussing some special looms he was buil-

ding ... a draw-loom, a "12 foot 12-harness loom" and a "dobby foom on a counter-shed or counter-balanced weave for 12 harnesses.")

Obviously, I feel strongly that handweavers in the United States should continue using terminology with which they are familiar and for which there is a preference shown, namely, "harness." would not think of expecting the British to change their practice of using "shaft." This is one of the exciting things about language .-

who knows in the year 2000 we may have a new term if there is an advance in the development of the instrument we now call a loom.

Mary Elizabeth Laughlin Newcastle, CA

In response to your editorial in the Winter 1982-83 issue of The Weaver's Journal, I would like to register my support for the use of the term "shaft." It seems to be increasingly accepted among handweavers for all the reasons you cited. Wouldn't it be a step backward to revert to a less precise word when already aware of and using appropriate terminol-

It is interesting to note that Harriet Tidball in 1961 urged the adoption

of "the universally used word 'shaft'" when she realized that it had the backing of the U.S. membership of CIETA (Centre Internationale d'Etude des Textiles Anciens). However, although her respected writing continues to be a major influence on weavers, I suspect that her recommendations on terminology (hidden in the Author's Note of The Weaver's Book and in the Addenda of Surface Interest) were too obscure to be heeded by more than a few careful readers.

Comfort with language comes through using it, and The Weaver's Journal, in its role of educator and communicator with weavers. not only reflects usage but can lead-correctly, I hope!

Doramay Keasbey Bethesda, MD

I find it difficult to say "shaft" instead of "harness" when talking about a single frame. I also hate to read "shaft" because in my mind, I am taking time to substitute "harness."

In my music field, we have many terms which are perhaps the more correct; but to a musician—we use those popularly accepted in this country and get along fine. I wish weavers would do the same about

several weaving terms. And I wish they'd be more consistent about other weaving chores and theory rules

But I know it can't and won't come about, But, Mrs. Barrett, please do decide in favor of "harness" and take a step in the right direction.

Adele Scott Sullivan, D. Mus. Morlon Grove, IL

Incidentally, in the harness/shaft matter-I think I'd cast my vote for "shaft" but at first when you discussed it, I rebelled against anything but "harness" as I was more familiar with that; however, I think "shaft" is probably more accurate, and could avoid confusion. I note that Edward F. Worst in his classic book sometimes uses "heddles" and "harnesses" interchangeably!! **Betty Entner**

Santa Maria, CA

My vote is for "harness" rather than "shaft." Present day usage probably influences the feeling.

I favor the Harness since that is the word I learned to use in my textile classes in college. Perhaps it could be printed: Harness (shaft), in future issues in order to make all "winners" in the debate.

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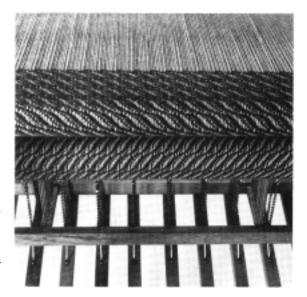
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MUSEUM TEXTILES: HOW TO GET AT THEM AND USE THEM

by Beverly Gordon

In recent years we have seen exciting upsurge in textile exhibits in museums and historical societies, on every level from local quilt shows to major national or even international shows of such objects as lace, rugs, coverlets and embroidery. It is by now reasonable to assume that weavers have some idea about the textile resources out there in the big cities and even in their smaller communities. The extent of these resources and the wealth of information they hold, however, is rarely appreciated. On the average less than five percent of museum collections are on view, and textiles on view are usually a small fraction of that. (Textiles are particularly vulnerable to the ravaging effects of light, dust, and acidic conditions in the environment, and any museum that keeps a large number out on long-term display is actually contributing to their destruction.)

Even when people have some idea of what might be in a museum, they usually don't know if there is any way they can see or make use of it; the "staff only" areas are often intimidating unknowns. This is particularly true in larger museums, where the larger and more valuable textile collections often are. The intimidation is understandable, and is by no means limited to "amateurs." A woman on the Extension staff of a major university spoke to me recently, telling me she had had an idea for years that textiles she was interested in were represented in a large museum collection, but because she didn't know how to go about it, she had never followed up on them.

In actual fact most museums do see

public education as part of their function, and access to behind-thescenes resources is not all that difficult. An understanding of the proper way to approach the people, institutions and objects involved is what is necessary.

There are a number of directories available which can help you find out what museum collections do exist. You will learn of the major holdings of important museums, and smaller, less overwhelming collections. A look through these directories will also provide some surprises, and you may find yourself motivated to visit a museum you might have otherwise bypassed. The Buffalo Bill Historical Center in Cody, Wyoming, for example, has an excellent collection of Indian artifacts, including 19th century Navajo blankets. The Mark Twain Memorial in Hartford, Connecticut houses the Candace Wheeler collection of fabrics. The Museum of the American China Trade in Milton, Massachusetts has an extensive collection of Chinese textiles.

Furthermore, when you are considering places to find textiles, do not stop at the obvious. Sometimes there are indeed textile divisions in museums, but these are relatively rare; the textiles are most often housed elsewhere—in Decorative Arts, Anthropology, History, Ethnology, or Costume, for example. Sometimes the same sort of object will be found in all these places! Remember too that while the large collections may have more objects, the small collections may have just the one thing you most want to see. As a general rule of thumb, small collections may prove easier to get into and more amenable to casual exploration.

When you are ready to visit a particular collection, try to get the name of a specific person to contact. If you can find a current edition of the Official Museum Directory or the Directory of Historical Societies, it will list curators and other personnel in various departments. If the institution is local, call the main information number and ask the name of the person in charge of your specific interest. Future calls or correspondence addressed to the appropriate person will mean faster, more personal and more satisfying service to you. A letter addressed to "Textile Curator" or "Curator of Decorative Arts" will probably get to the right person if you are unable to find names.

Call or write this individual to set up an appointment, and try to allow two weeks notice if at all possible. While is may sometimes be possible to get a last-minute appointment (and it can be worth trying if you are unexpectedly in town), it is an imposition on staff time and not to be counted on.

Probably the most important thing to keep in mind is to write or call with a specific question or idea of what you want to see. Never call a curator or staff member and say, "I want to see your collection;" nothing will prove more alienating. Museum personnel are usually sorely overworked and underpaid, and will feel exasperated at best with such a request. Not only is it impossible from their point of view, but without a particular focus you, as a visitor, will not benefit much



Overshot coverlet; courtesy of the Memphis Pink Palace Museum, Memphis, Tennessee,

from what you see. If you really just want a general idea of what is in the collection, explain your general interest and ask to see catalogue information. This will not require the same kind of staff time and will not involve the actual textiles at all.

The kinds of questions you might go in with and the things you might want to see can vary widely. If you are learning how to use a backstrap loom, for example, you might ask to see examples of backstrap pieces from such diverse places as Gua-

temala and the Philippines. In looking at them, you could study how selvedges and heddle-area weaving are handled, what kind of finishing treatments are added, and what kinds of unique operations the loom might help you do. If you are studying doubleweave you might ask to see Huichol Indian bags instead of the obvious coverlets. You might ask to see six different handwoven blankets and compare something as simple as thread count and spacing, noting to yourself what works successfully and what doesn't, and why and

how. You might choose to study color relationships in a certain weave structure, or the use of patterns in pickup weaves. As already implied, when you look at textiles or other objects with specific questions in mind, you will see them in a different way—you will look at them more carefully and closely, and will remember them better.

If you are actually studying a series of similar textiles—a number of Hopi wedding sashes, Beiderwand coverlets, Rya rugs—work with a standard form. This sounds dry

and formal, even tedious, but it is truly a time saver and an efficient way to work. If you make up a form that lists characteristics you are looking for, whether measurements, ends per inch, yarn characteristics, color, or whatever, you can come prepared with several photocopies and simply make check marks or fill in the blanks when you look at the actual textiles. Later, you will have consistent and complete information on the examined objects, something that is surprisingly hard to do without such a standardized sheet. If you leave room for sketches and comments, you will have everything well organized and in one place.

You should also come prepared with other equipment. Bring several pencils (ink pens can harm textiles) and paper (graph paper if you are interested in charted designs or patterns), a tape measure, a small magnifying glass, and possibly photographic equipment. You will have to check out the museum policy on the latter, but if you do plan to take pictures, have everything you need with you: camera and film, lenses, flash attachments, a tripod, background cloths, and possibly your own lights. It's a good idea to take photographs with a ruler in the picture too, so that dimensions are immediately ap-

Wash your hands before you actually touch the textiles. You may be asked to do this by museum staff, and don't be embarassed if you are, for it is a precautionary measure and does not reflect on your personal standard of cleanliness. Handle the textiles as little as possible, and never lean on them, put books on them, or put them under any pressure. Treat them as the fragile resources they are.

Museum records may be available for the items you look at, and may sometimes provide good information for you. As a general rule of thumb, the more recent the documentation, the better you can trust it. The museum field is only now

becoming highly professionalized, and complete and accurate information was not always demanded in many places in the past. This was not intentional—unknowingly, people donate objects to museums with misinformation (attributing something to a great-grandmother instead of a grandmother, for example), and it takes a good deal of training and experience to both spot this kind of errors and ask the right questions about an object. Generally, the staff will tell you if they think the written information is dependable. A more common problem, unfortunately, is that there is hardly any information at all about specific objects.

The more you know about the kind of textiles you are looking at, the better you will be able to evaluate museum documentation, and the better you will be able to evaluate the pieces themselves. It may seem like a paradox to suggest you learn as much as you can first through reading and looking at pictures, and also to state that nothing will teach you as much as the textiles themselves, but it is true. Ironically, the more you know, the more you learn.

If you really have no interest in specific questions and want to get a general feeling about textiles, you might consider offering your services as a volunteer. Contact the same curator or staff member that would handle the textiles for specific research, and set up some sort of regular schedule. Be prepared to do anything from sewing on labels or hanging sleeves to doing historic research. Volunteering may be a luxury to people with full-time work schedules (museum offices, unlike exhibit areas, are generally closed on weekends), but it might be possible to spare two mornings a month. This kind of general exposure often leads to more specific interests and questions, and many knowledgeable museum workers started as volunteers.

Once you have gone behind the scenes in a museum setting, even on a single visit, you will have increased confidence about being able to do it again, and will be able to approach even the most formidable institution. If for some reason your request is turned down, do not take it personally, but think about ways of reformulating it or taking it elsewhere. Ask questions and seek answers, for there is an enormous amount to find out, and many ways of finding it.

Helpful Directories

A Directory of Where to Find Embroidery and Other Textile Treasures in the U.S.A. National Standards Council of American Embroiderers, Museum Information Service Committee, 1977. (\$3.00)

Official Museum Directory. Annually published by American Association of Museums. (Available in public library reference collections.) Includes categories of museums, such as "arts and crafts." "decorative arts.", etc. Also includes appropriate people to talk to.

Directory of Historical Societies and Agencies in the U.S.A. and Canada. Published periodically by the American Association of State and Local History. Has very thorough listing of even small agencies. (Also available in public library reference collections.)

Lubell, Cecil, ed. Textile Collections of the World. New York: Van Nostrand Reinhold, 1976. Volume 1: United States and Canada, Volume 2: United Kingdom and Ireland, Volume 3: France. In the U.S. volume, about 60 collections are listed. Descriptions of such things as specific collection names, special libraries, publications, and who to write to are included.

Bach, Pieter, ed. Textile, Costume and Doll Collections: in the United States and Canada. Available from R. Shep, Publisher, Box C-20, Lopez Island, Washington 98261 Lists addresses, types collections, 1,500 museums and collections included. (\$4,95)

ABOUT THE AUTHOR: Beverly Gordon is completing a doctoral degree in Environment, Textiles and Design at the University of Wisconsin, where she teaches design and textile history. She is also a researcher at the Helen Allen Textile Collection there. She has worked in a number of museum settings, including Hancock Shaker Village and Historic Deerfield. She is an experienced lecturer and workshop leader, and a nationally acclaimed writer. Her books include Domestic American Textiles: A Bibliographic Sourcebook (1978). Shaker Textile Arts (1980), Feltmaking: Traditions and Contemporary Explorations (1980), and The Final Steps (about cloth finishing) (1982).

Beverly is concerned with integration of technical expertise and historical and cross-cultural understanding. She gives work-shops and lectures on textiles, including feltmaking, dyeing, design, and cloth finishing. She also lectures on historic American Textiles and gives seminars on Women and Their Environment.



1. Chilkat Dancing Blanket, "The Nesbitt Blanket"; from private collection.

THE BREATH OF OUR GRANDMOTHERS by Cheryl Samuel

In the time before time, there came a need to build a nest, to gather a harvest, to blanket a body. Fibers, gathered from the plants and the animals, were twisted together and then drawn through each other; Weaving began.

As time grew into history, the uses of threads multiplied. Blankets became gowns, walls were warmed with tapestries, cloths covered the dead. In societies all over our earth, the human need to decorate, that need which transcends utility, found glory in threads. Function was swathed in beauty. The technical traditions which accompany

these cloths tell a tale of human generations, of knowledge passed from parent to child to grandchild. This knowledge cradled more than practical technique; it contained all the giving and sharing, all the teaching and learning of human kind.

Thirteen years ago I fell under the spell of the Chilkat Dancing Blankets (Photo 1). I was new to weaving, in a time when the force of "freedom" prevailed upon art, and technique was frowned upon. Traditional methods were being defied, traditional materials denounced. Anything was possible, everything

was tried. Grandmothers were forgotten. Modern intelligence and a stated desire to "express oneself" was all that was needed, it was felt, to produce magnificence. The results, while imaginative, lacked the vital elements of discipline and function which had produced great art for generations.

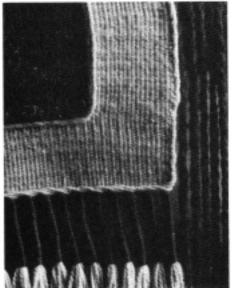
New to weaving in this "free" era, I too fell victim to its pulses. I wanted to know how Chilkat weaving was

Cheryl Samuel is the author of The Chilkat Dancing Blanket 1982 Published by Pacific Search Press, 222 Dexter Ave North, Seattle, WA 98109.

Drawings by Sara Porter

done because I saw a use for it in contemporary design. Fortunately, the mysteries of this incredible art form were not easily unwoven. First, there was no one to teach me; the weavings themselves became my grandmothers. Patience, that virtue of all weavers, became my Master, I could not unravel a Dancing Blanket, they were too valuable for such Penelopes. Technical curiosity and a love of perfect circles kept my initial interest kindled, and I found that the more I learned. the more I needed to learn. If I could not unravel a weaving, I could build one. Bill Holm taught me that to understand a technique I had to be able to duplicate it. Feeling the impetus of the times, I found that although the intellectual challenge was great, the creative challenge was insufficient. I still had a desire to explode the traditional techniques into the modern world; I wanted, even, to better those techniques. Fortunately, the native weavers saved me from gross arrogance. Whenever I thought I knew more, or best, and attempted to improve on a technique, I was humbled. Again and again, the traditional perfection of rhythms, passed on from generation to generation, proved more efficient, more beautiful, more enduring than anything I could "invent." My respect for traditional knowledge became immense. And yet always in those days, I claimed I would never DO Chilkat weaving. I still wanted to learn the techniques, to satisfy my curiosity and transfer some of the knowledge to "contemporary" art. I made tiny inroads towards this end, weaving in 1974 Starfish (Photo 2), in which I joined a combination of rya and tapestry techniques with the marvelous three-strand twining of Chilkat weaving. Warp-wrapping, too, employed to decorate the warp fringes on Chilkat tunics, found its way into Starfish (Photo 3).

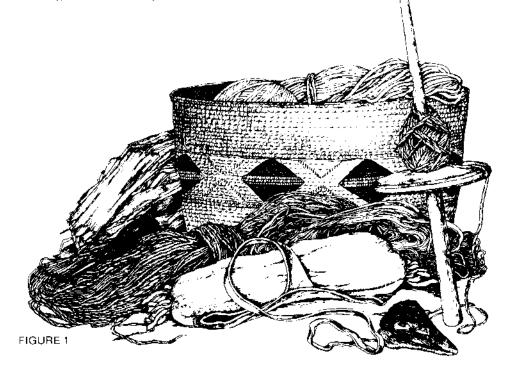
That was nine years ago. Gradually, and for a few years, the intellectual challenge became sufficient unto itself. The more involved I became in Chilkat weaving, the



3. Starfish border detail; 3-strand twining and warp wrapping

more it consumed me. Eventually, having finished a master's degree in Fine Arts, having produced "modern" weavings, having become Director of Fine Arts at Lester B. Pearson College, my dear friend Ann Meerkerk said to me, "Cheryl, when are you going to stop dabbling in Chilkat weaving? When are you going to write it down?" The enormity of the suggestion was immediately apparent; give up my full time job, do freelance research, write. I hesitated through respect for native traditions. Chilkat weaving is an inherited right, passed on from generation to generation in the traditional culture. I do not belong to the culture; I have no traditional right to weave. I was eventually persuaded to write what I knew through the fact that it was such a waste not to share it. With years of learning behind me, it seemed that no one should have to start once again at the beginning. Many people have asked if I learned from native women. At the time that I was beginning, only one traditional weaver was still working. Her name is Jenny Thlunaut and she is now in her nineties. One does not go to such a woman and ask that she share all she knows; one must be invited. It is only now. after gaining the knowledge that I have through years of work, that I have been invited.

Perhaps it was brave, certainly it was altruistic; I did resign my job and devoted my time to writing. Time, energy—all was dedicated to "The Book." Fanaticism took over; it almost had to. In order to share my ever growing admiration for the beautiful weavings I had the privilege of working with, I wanted to write a book that was as beautiful as I could possibly make it. I wanted to glorify the weavers, to honor the society, to pay my deepest respect to the culture which produced this magnificent art form. I knew that the book had to be human, that it had to touch souls as





4. Two-strand twining done with S twist yarns

well as intellect. At the same time it had to work for weavers; the technical chapters had to be clear, precise AND beautiful. My illustrator, Sara Porter, lived with us for nine months; she suffered my perfectionism with an even temper and, infected by the vision, captured that spirit of beauty in her drawings (Fig. 1).

The book has now started a life of its own. I find myself feeling a new beginning, stirred by a growing excitement of what is to come. Perhaps my apprenticeship is now over; certainly I long to Weave. The weavings that I feel inside me are no longer "modern" in the sense of emanating solely from a desire for self-expression. Instead, they stem from tradition, from the breath of those grandmothers. I have a technique which can now be honed, and I have the shape of a tradition to build upon. I am honored with commissions from native people who wish to dance in these beautiful garments.

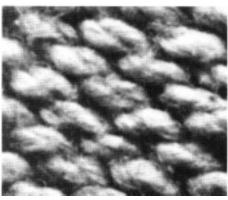
The Chilkat Dancing Blanket represents a tradition as it existed at its highest form of perfection. It tells the best of what WAS. Today, new weavers are faced with new challenges. A romantic notion has grown up in the lay world that weaving, especially ethnic weaving, to be good must be done with handspun threads colored with natural dyes. Ironically, in Northwest Coast art, contemporary carvers are never expected to use stone knives and painters would be wondered at if they chewed fish eggs to produce a binder for paint. Chain saws and acrylics are per-



FIGURE 2. S twist and Z twist

fectly acceptable, yet the public always asks if, as weavers, we dve our own wool "the native way." I ask, is it necessary for anyone to stand over pots of old urine boiling for days on end, to produce dyes which, with contemporary usage, will fade to white in ten years? Can we not spend an equivalent amount of time utilizing contemporary materials to their best advantage? In the old days, native weavers were quick to experiment with new materials when they became available. They adopted some and discarded some, depending on the aesthetic result. Haida artist Bill Reid says that "all art must be a living thing or it is not art at all." Living things are not static.

The question of materials is an important one. Should techniques bend to accommodate new materials? Chilkat weaving was originally developed in conjunction with 2 ply Z twist yarns. The basic twining process is two-strand twining with a Zangle. If this twining is done with an S twist yarn, the wefts unspin while they are being twined, producing a different visual texture (Figs. 2 and Photos 4 & 5). There are very few appropriate 2 ply Z twist yarns on the market today, but there are quite a number of 2 ply S twist yarns, commercially dved in the most perfect of Chilkat colors. The obvious answer is to reverse the twining process, adapting it to modern yarns. The integrity of the weaving technique remains intact while taking advantage of the saving in time provided by the commercial yarns. A Dancing Apron takes three months to



5. Two-strand twining done with Z twist varns

weave; to spin and dye all the yarns for an apron takes another three months. The question arisesshould we adapt the technique or should it remain traditional? I must admit to being partially responsible for this dilemma. In my enthusiasm to record and perpetuate the best of the old Chilkat weaving tradition, I emphasize the importance of the twist of the yarns and their relationship to the twining techniques. The native weavers, when presented with S twist yarns in the latter half of the nineteenth century, appear to have been unconcerned about twists of yarns and angles of twining; they carried on with the established technique regardless of the yarn being used. The whole question may be a bagatelle. I, however, shall pursue the adaptation of technique to the yarns being used due to my tremendous respect for the success of some of the oldest and finest weavings. If the weaving is done perfectly, it would be very difficult for all but the most knowledgeable to even see the difference between weavings done the "new" or the "old" way. And the difference does not matter, for it is the end result that is important. The challenge of new materials is a challenge of integrity; they should be used because they are the perfect answer for a specific need. Good techniques, good materials, good design; these, married to a dedication to perfection, give birth to masterpieces.

Time and again I go back to the work of the weavers, back to the inspirations which moved them

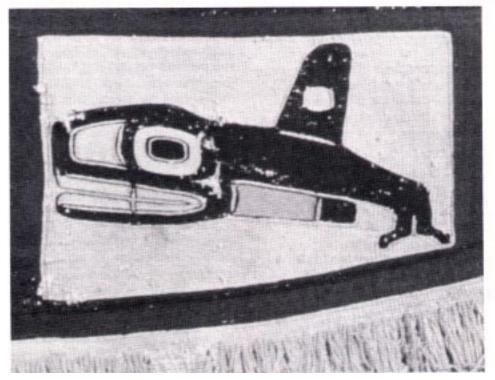


7. Detail of Killerwhale Apron showing geometric techniques

then and speak to us now. New weavings rise out of old traditions; the Killerwhale Apron (Photo 6) is an amalgamation of an old whale design (Photo 8) and an even older tradition of geometric weaving (Photo 7).



2. Starfish, 1974, by Cheryl Samuel



8. Detail of an old whale design; courtesy of the Field Museum, Chicago.

WJ

Recently I collaborated with Duane Pasco, one of the finest carvers on the coast, to produce the Sea Eagle Mask (Photo 9). Duane carved the mask which is inlaid with abalone eyes and copper nostrils, and designed a Chilkat trailer and wings which I wove (Photo 10). The piece is a natural outgrowth of the work that Duane and I have been doing together on design; the excitement and honor of combining skills and inspiration with another artist is immense. We are learning about design for weaving: which traditional painted forms are easily woven and which ones need to be adapted to the ways of wool. Our knowledge grows as we work together; perhaps we are repeating a rhythm of the past, of the days when designers and weavers worked together to produce the finest of the Chilkat Dancing Blankets.



6. Killerwhale Apron



9. Sea Eagle Mask, 1982, by Duane Pasco and Cheryl Samuel; from the collection of Lawrence Korwin.



10. Sea Eagle weaving, 1982, by Cheryl Samuel; before mask attachment.

SHAKER TEXTILES

by Nancy Hillenburg

After visiting the Shaker village of Sabbathday Lake, Maine, eight years ago, I began a quest for knowledge of how they wove the exquisite textiles displayed in their museum. In their search for God's Kingdom on earth, the Shakers or the United Society of Believers in Christ's Second Appearing conceived simple designs for functional products. This utilitarian approach resulted in textiles, furniture, architecture, utensils, and agricultural products that are admired for their usefulness, perfection of design and high quality of construction.

As a California-based weaver and historian, I launched this quest by reading about the Shakers, searching for drafts and weavers' manuals, visiting the existing Shaker Villages for a closer examination of their textiles, and asking the remaining Shaker weavers many questions. But ultimately I was forced to return to California libraries to read microfilmed diaries and journals of Shakers from the nineteen original Shaker communities from Maine to Kentucky.

The Shakers originated in the area of Manchester, England, in the early seventeen hundreds as the "Shaking Quakers" under the leadership of Jane and James Wardley. Ann Lee, a textile factory worker, became the spiritual inspiration for the group about 1758 and led a small group to America in 1774 to avoid persecution. They settled at Niskeyuna, New York, near Albany. From there they founded communities in Western New York State and New England. Shakerism was founded on the beliefs of revelation, spiritualism,

celibacy, oral confession, community of property, non-resistance, peace, healing, miracles, and separation from the world. The motto, "Hands to work, hearts to God," given to them by Mother Ann Lee. expressed their approach to life. In the early eighteen hundreds following the Kentucky Revival, they expanded to open communities in Ohio, Kentucky, and Indiana, Their membership peaked in the mid-eighteen hundreds when it rose above six thousand. Following the Civil War, the industrial revolution in the U.S., and the westward movement, Shaker enrollment declined. Eventually in the early twentieth century, communities were forced to close their doors and move in with other Shaker communities. Today, two Shaker communities remain: one at Sabbathday Lake, Maine, and one at Canterbury, New Hampshire. Others have closed or been restored as historical sites.

It is still possible to visit several of these communities, and to learn about their religion, their way of life, and specifically about their unique textiles. Because the Shaker communities were based on an agrarian economy, they wove cloth to meet all of their textile needs as early as 1780, much the same as any rural colonial household. Because of their communal style of living, they wove in great quantities. Eventually, they sold some of their textiles to those outside their communities, referred to as the "world's" people. When it became economical or practical to buy cloth to meet any particular need, they stopped weaving it themselves. However, they wove rugs, mats,

palm or straw bonnets, and boxes of poplar wood until after the midtwentieth century.

The majority of Shaker weaving was plain weave that appeared distinctive because of the subtle use of color combinations, the plying of weft threads in various colors in "S" and "Z" twists, and the balance, order, and symmetry in the over-all design. However, they also wove twills, twill variations, and small pattern weaves in huck, diaper, and "M's and O's". I have located drafts for these on four shafts, and also several six-shaft drafts for "sattin," "Lasting," and "striped Dimity."

In order to get a feel for Shaker weaving, I began by weaving neck scarves from 3-ply wool purchased from the Sabbathday Lake Shakers. They still raise sheep and sell worsted in several colors. The wool is spun and dyed by a local mill. (See Photo 1).

Sett: 10 epi (40/10 cm) Weft: 3 ply Shaker wool Color sequence of the weft:

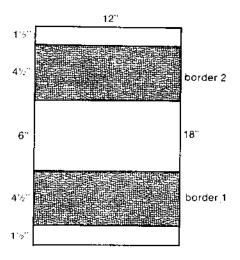
lt. brown	2		2			
lt. green		2				
*				3		
pink					1	
**			Γ		Г	3

*Med. blue, heather brown, and white softly plied in an "S" twist **Same yarn plied in a "Z" twist Finished size: 9½ x 36" (24 x 91 cm) plus ½" fringe

One Shaker draft suggests to ply by twisting "together spinning way not twisted hard," for "S" twist, and then twisting "twisting way" for "Z". The soft twists give the feeling of movement in the weave, whereas a hard twist gives a speckled appearance and the movement is lost.

After seeing a marvelous rug at an Elmira College Shaker Seminar in Enfield, New Hampshire, once the site of a large Shaker community, I was inspired to try this "twisting weft" process in a rug (Photo 2). The process is described by Peter Collingwood in *The Techniques of* Rug Weaving. I had several excellent slides of the rug and had completed a rather hurried analysis of the rug itself, but my weaving attempt was a failure. I used "Nehalem" for weft in six colors: green, red, blue, gold, and natural. This thread seemed about the same size, texture and color as the old Shaker yarn. The original rug was woven at Canterbury, New Hampshire and traded to the Kentucky Shakers for their hand woven silk. The rug was a long runner three feet wide and fourteen feet long. The weft sequence was: 4 shots of natural, green, and red thread plied in an "S" twist; 1 of a blue wool rag: 4 of natural, blue, gold, and red thread plied in a "Z" twist; 1 of green wool rag; and repeated. What I missed in my quick analysis and could not see on the slide, was that the plied threads were of slightly varying weights and ply themselves, and the natural thread was cotton. In the original rug, the blue thread was thinner to compensate for one more color in that "Z" sequence. Later I acquired a section of a matching rug. I then discovered on close examination that the warp was blue cotton faded to white, set 12 e.p.i. (50/10 cm). The cotton in the warp and weft gave it the stability that my wool version lacked. It was a year between my weaving and my discovery of the solution to the problem. However, in the meantime I discussed it with Sister Elsie McCool, a Shaker weaver at Sabbathday Lake, Maine. She told me she wove on a linen warp set 12 e.p.i. (50/10 cm), and eighteen inches (46 cm) wide. on a 2-shaft loom. She sometimes used the cotton warp thread plied with wool for stability in the weft. She also warned about over-twisting the weft.

Recently, I have applied the technique of controlled twisted weft to add color and movement in linen and wool place mats. They were very successful. They were colorful and of a nice weight. Because they were my own inspiration and also have a "Shaker" look to me, they were much more satisfying to weave than the rug. Of course, I learned from my mistakes.



Warp: 10/2 linen, royal blue Sett: 8 epi (30/10 cm) Width in the reed: 13" (32 cm) Weft

10/3 linen, royal blue plyed wool: *dk brown, pink, blue Shaker worsted in "S" twist, ** dk brown, pink, blue Shaker worsted in "Z" twist

Weave structure: plain weave Border 1: 3 picks linen, 3 picks * yarn; repeat 6 times Border 2: 3 picks linen, 3 picks ** yarn; repeat 6 times

Finished size: 12" x 18" (30 X 45 cm) with 1" (25 mm) fringe

To me the finest examples of Shaker weaving are silks: these inspired me to weave an iridescent silk scarf in plain weave with tram silk of royal blue, dark blue or pink weft on a cherry red tram silk warp set 80 e.p.i. (320/10 cm) (Photo 3). I wove borders by doubling threads in a shot. When I finally used twelve threads together, my border was visible. The silk was the most exciting and at the same time the

most tedious weaving I ever attempted, but I gained a great respect for the beautiful Shaker handwoven iridescent silk scarves set at 125 e.p.i. (490/10 cm)!

Shaker art in the form of spirit drawings done in the early 1800's inspired me to weave a wall hanging of the Shaker Tree of Life (Photo 4). For this, I used an overshot pattern for background on an oatmeal-colored synthetic warp. I wove the background with the same thread and laid in the tree design of red and green wool that I spun and dyed with natural dyes. The technique is explained in Else Regensteiner's Weavers' Study Course, p. 125. I used the "blue clover" overshot pattern, but shaped the tree to be similar to the Shaker spirit drawing by Hannah Cahoon of Hancock, Massachusetts in 1834.

At the beginning of this quest I was disappointed that I was unable to locate many specific instructions and drafts for Shaker weaving. However, I have learned to study the existing textiles very carefully and to experiment on my own with inspiration I have gained from my friendship with the Shakers and my continuing understanding and respect for their unique contributions to our society.

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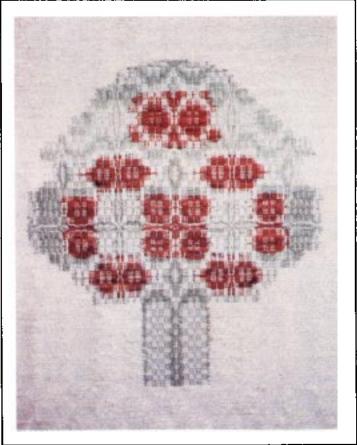
1. Wool Scarf



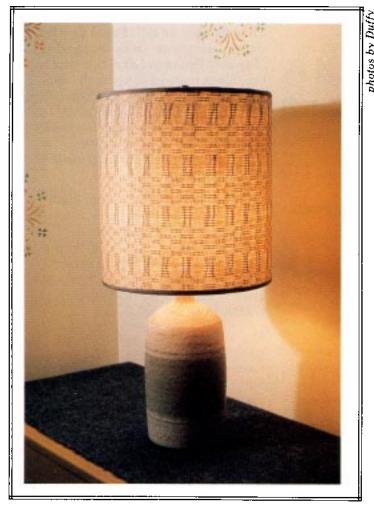
3. Silk scarf

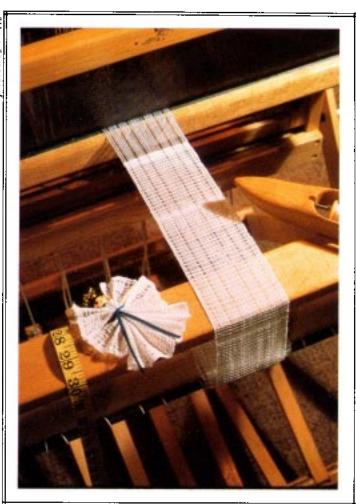


2. Detail of old Canterbury Shaker rug.



4. Shaker Tree of Life hanging, inlaid on overshot, by Nancy Hillenburg.





1. Lampshade

2. Shaker angel

HANDS TO WORK AND HEARTS TO GOD

by Mary Elva Erf

Throughout history, linen has played an important role in the cycle of life. This was particularly true in the Shaker communities. This religious group, officially known as "The Society of Believers in Christ's Second Appearance", was founded in 1784 by Mother Ann Lee and her eight followers. They believed in communal property, celibacy, and simplicity. During the 19th century, the Shakers founded 18 communities in the eastern United States with over 6000 members, and they devoted themselves to a life of "Hands to Work and Hearts to God". Their diligent craftsmanship was a means to express their heaven on earth. Most of us are aware of their fine crafted furniture and heautiful architecture. Their textiles also display a sense of good design and elegant proportion.

It is recorded in Hannah Treadway's Shaker "Journal of Domestic Events 1843-1864" that the preparation of flax followed a definite pattern. The seed was usually planted mid to late April and harvested late July to early August. The plant was then retted and the sisters would finish breaking and

hackling the fiber, finally spinning it into the finest of linen. This thread was used to weave material for clothing such as frocks, aprons, handkerchiefs, caps, and for household items such as towels, cheese strainers, and ironing cloths. The tow flax, a shorter fiber, was spun and woven into coarse barn frocks, seed sacks, carpet warp, and trousers. The processing and weaving of linen continued in some communities as late as 1854 when it was gradually replaced by cotton.

Many of the old linen patterns were

used by the Shaker weavers, and they developed a good eye for proportion and design. A plain weave towel might have a simple stripe worked out by grouping several threads in one dent, sleying one in a dent for an inch or so, and then grouping several more threads in one dent. This would create a very subtle design. Among the linen weave structures they used were the following: M's and O's, Huck, Bronson, Goose Eye, Fine Dimity. and other variations of twill.

In 1981 I was asked by the Metropolitan Museum of Art in New York City to reproduce four textiles for a permanent exhibit of a Shaker retiring room. These pieces included a blue woolen blanket, a bleached linen pillow cover, a bleached linen M's and O's towel. and a blue and white checked linen towel. Before weaving these fabrics, I had to research and document their weaving structure.

Among the linens that I examined at Hancock Shaker Village was a lovely handspun linen towel with an M's and O's design. The warp is approximately 48/2 bleached linen sett at 40 epi (160/10 cm) and the weft 30/1 bleached linen. It was 16 inches (41 cm) long and 35½ inches (90 cm) wide with $\frac{1}{4}$ inch (6.4 mm)hems. Another M's and O's design towel was located at the Canterbury New Hampshire Shaker Community. As a result, I reproduced a linen towel in this weave structure for the New York Metropolitan Museum of Art.

LINEN M's and O's TOWEL. See Fig. 1.

Warp: 40/2 bleached linen.

Weft: 20/1 bleached linen.

Sett: 40 epi; 36 ppi. (160/10 cm;

144/10 cm

Width in the reed: 18" (45 cm)

Pattern: See Fig. 1

1. threading units for block A and block B

- 2. profile draft
- 3. treadling for pattern in block A. pattern in block B and for the 4"

Measurements after washings: 16" X 35½" (40.6 X 90.2 cm)

Source: Hancock Shaker Village

This M's and O's pattern was then adapted to a more contemporary purpose, that of a lampshade. Here I worked with 20/2 natural linen warp and 16/1 grey linen weft which produced a color and design effect that complemented a pottery base. The profile draft shows the A and B blocks alternating and then the B block repeating four times. This is very similar to the original Shaker piece, but the 'beat' of this lampshade material was gentle to achieve a more open look (Fig. 2) and Photo 1).

FABRIC FOR LAMPSHADE. See Fig. 2.

Warp: 20/2 natural linen Weft: 16/1 grey linen

Sett: 24 epi, 16 ppi. (100/10 cm,

65/10 cm

Width in the reed: 14" (33/6 cm) Pattern: see Fig. 2.

- 1. threading units for block A, block B and for the selvedge.
- 2. profile draft
- 3. treadling

Another linen weave structure used by the Shakers was spot Bronson. Here I adapted a design to make a little 'Shaker angel' (Photo 2). The weave structure was expanded (Atwater Bronson Lace) to create a lace block instead of using the spot weave (Fig. 3). Then the threads were sleyed with 'skipped dents' to further emphasize the laciness. The finished material was not washed as I wished to maintain the sizing for a more crisp look.

FABRIC FOR ANGEL. See Fig. 3. Warp: 70/2 bleached linen Weft: 35/1 bleached linen Sett: 45 epi in a 15 dent reed. Skip a dent after 2 repeats, after 5 repeats, after 8 repeats, after 13 repeats, after 16 repeats, after 18 repeats Width in the reed: 3"

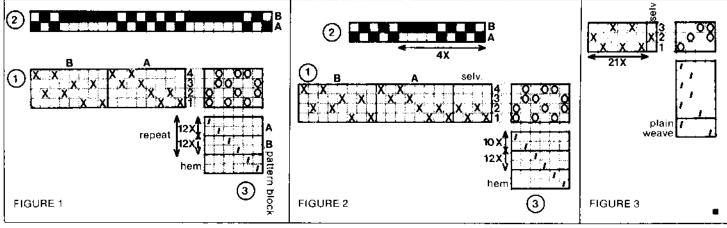
My research in analyzing and recording the Shaker weaves continues at the various Shaker museums. If anyone has knowledge of documented Shaker textiles, I would be very interested in hearing about them.

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ABOUT THE AUTHOR: Mary Elva Erf. though the mother of four children, has found time for a career as a weaver and a teacher. Shaker weaving is on of her special interests. She is a graduate of Michigan State University and has taught crewel and canvas embroidery, miniature textiles for dollhouses, and classes in spinning, dyeing and weaving. She has presented lectures and exhibits for Connecticut Historical Societies, Handweavers Guild of Connecticut, New England Weaver's Seminar, Glastonbury Art Show, and the Connecticut College in New London



AKLAE: NORWEGIAN TAPESTRY

by Sonja Irlbeck

INTRODUCTION

Aklae is a broad term which describes a Scandinavian coverlet or decorative hanging which originated in Norway. The pieces added vibrant color to home decor. During special occasions, they were placed on the walls for decoration, and then stored or sometimes used for bed coverings. The Norwegian tradition of oral teaching is the way the Aklae techniques were passed down through the generations. It is a special tapestry weave using a single interlock technique. The plural form of aklae is "aklaer".

The most original contribution of aklae to the arts is the strong coloristic variations of geometric designs.

More specifically, aklaevey (aklae weave) is a coverlet with a border at top and bottom of the woven piece and a motif in the center. The eight pointed star is a typical Norwegian motif. The borders are usually different at the top and bottom. There usually is no side border. The warp doesn't show; it's covered by the weft yarns and turned under at the ends. Original warps were linen, but today's cotton is long lasting. Weft varns are two-ply wool that have a tight twist, and are scratchy. A minimum of three colors is used; that is, three basic colors with a white accent. No one color stands out. All colors have equal emphasis in the finished piece.



1. Aklas sampler

SETTING UP A SAMPLER

Aklaevev needs few materials or accessories to be completed successfully. First a "cartoon" or planned drawing is sketched. A rigid heddle loom is the main piece of equipment. A tapestry beater is helpful and small shuttles are nice. but an old fork and yarn "butterflies" work just as well. A darning needle is used to weave in the warp threads and cut ends when the finished piece is taken off the loom. The warp thread may be cotton seine twine (12/6) or linen (8/3). The weft is wool tapestry yarn from Scandinavia. These yarns are available in a number of sizes.

Although completing a tapestry piece is a slow process, the techniques are basic. An aklaevey piece should be completely planned beforehand, using graph paper and colored pencils or markers to design the motif to be woven. Completing the design on paper will allow you to have a sense of both design and color in the finished aklaevev and to plan the length and width you need to complete the piece. Use 1/4" graph paper and colors to complete the draft exactly as you want the finished weaving to look. Spend adequate time on this planning stage, drawing out several samples in order to achieve a balanced pleasing effect. For design ideas look at finished aklaevev or browse through books listed in the reference section of



2. Aklae; courtesy of the Norwegian-American Museum, Decorah, Iowa

this article. Plan the motif section of the weaving so you know how many ends need to be warped.

For a beginning project start with a warp about 36" (91 cm) long and 8" (20 cm) wide. The materials you will need are: tape measure, scissors, graph paper, notebook, markers in the basic colors, tapestry needle, table fork or tapestry beater, pick-up stick, loom, warp yarn (cotton or linen) and weft yarn (tapestry wool).

Choose three or four colors of Norwegian weaving wools (see the list of yarn sources at the end of this article). You may be able to request your local yarn shop to order the yarns. For the size aklaevev described here, purchase two skeins each of your major colors.

After you have completed your design on graph paper, warp your loom at 8 or 10 epi (ends per inch), 30 or 40/10 cm. The total number of threads must be divisible by either 4 or 6, so you will have pattern blocks of even numbers. An uneven number of blocks (of four or six threads each) allows you more choices for geometric designs on your weaving. Examples are shown in the following chart.

At the beginning of your weaving, weave in rag strips or old yarn to help even up the threads and tension. Weave these rags or yarn for the desired fringe length.

Prepare your weaving wools by winding yarn "butterflies" or using small shuttles. Make as many butterflies as you need to start your project. Refer to your cartoon (design drawn on the graph paper) to determine how many butterflies to make for each color.

WEAVING A SAMPLER

Begin weaving a solid color for an inch or more. This will be the top of the completed aklaevev. If you intend to turn back the top for hanging, weave a longer block of solid color. The general areas of the aklaevev will be 1) beginning stripes and designs; 2) motif; 3) lightning pattern; and 4) ending stripes and designs. This section will describe the techniques used in creating these patterns. The motif section will take the most time to complete.

SINGLE INTERLOCK TECHNIQUE

This method involves twisting threads around each other in the same shed, thus eliminating the ridge that forms when two threads are locked around the same warp thread. The single interlock technique makes possible a reversible piece of work. The interlock is usually done when weaving from right to left with the left selvedge thread up (see Fig. 2). Change the shed, beat and weave a non interlocking

number of design blocks	number of threads per block	total threads	inches wide at 8 epi	inches wide at 10 epi
19	4	76	9.5"	7.6"
19	6	114	14.25"	11.4"
21	6	126	15.75"	12.6"
21	4	84	10.50"	8.4"
Compa	erison of blo	cks of thr	eads to inche	s



3. Aklae sampler from Norway

row from left to right (see Fig. 3). Turning must be done very precisely so the color changes appear to be in a perfectly straight line. Unless the turns are precise the design area will appear uneven and ragged. It's a problem at first to get a smooth interlock. Keep the loop of the two interlocking threads against one of the warp threads. This will help keep the interlock even as the work progresses.

STARTING THE WEFT YARNS FOR THE PATTERN AREA

When weaving aklae you change colors often in order to carry out the geometric patterns. The first inclination is to cut one yarn as you begin a second color. This results in many ends to weave into the finished piece and may cause unsightly bulk or bulges. There is a technique for changing colors in the weft yarns without cutting, which saves time, yarn, and eliminates the problem of weaving loose ends into complicated work.

4. Aklae detail (below)



Start a new weft for color changes by weaving a second color only in the direction in which the first yarn is going (see Fig. 1). Start in an non-interlock row (usually from left to right). On the left edge of the noninterlock row weave in the first color. Weave in the second color, overlapping the first. Continue in this way with any colors that are extending further to the right. Change sheds and begin to lay in the second row. Begin with the first color on the right (Fig. 2).

EXTENDING THE PATTERN

For any color that will extend over another color, overlap the colors in the same shed (See Figs. 4 and 5).

If a yarn must be extended beyond its current position over another yarn on the interlock row, it cannot be interlocked. Therefore the third row looks awkward (see Fig. 4). This will even out after the fourth row is completed. Check the work carefully before going on to avoid errors in the process that cannot be corrected later. Be sure the warp does not show during the process.

BORDERS

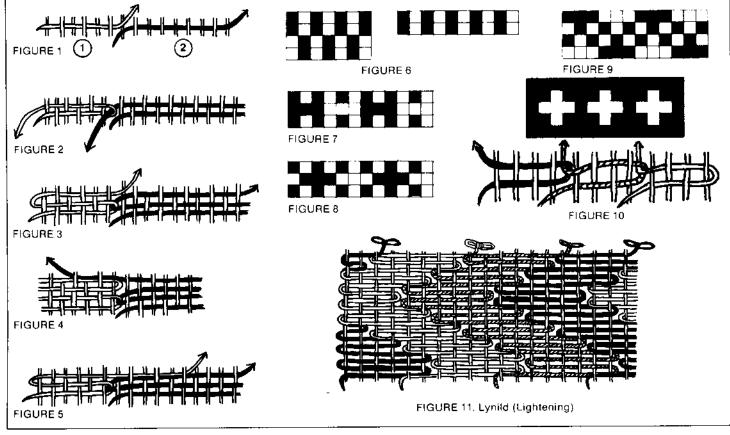
Various border techniques are used at the top and bottom of an aklaevev, although occasionally they comprise the entire piece. The wool is eased into the shed and bubbled to form a full, rich texture. It is beaten down tightly so the patterns are sharp, their outlines clear, and the warp is covered.

Stripes: Stripes in aklaevev are generally narrow and symmetrical and include the same basic colors found in the overall piece, but avoid a large block or emphasis of one single color. They often divide motifs from each other. Three rows of a color will result in a straight line. Two rows will result in a wavy line. Many interesting variations can be produced by using all your colors.

Kjerringtenner: The translation of this Norwegian word is "old lady's teeth". Three contrasting colors are generally used, such as white with blue or red. Colors are placed in alternate sheds for three or more shots of each color to build

a vertical striped or toothed effect, for example repeating white for tabby a and blue for tabby b. Then the colors are reversed by weaving two consecutive shots of one color to alter the positions of tabby a and b. Kjerringtenner, together with stripes, are basic to most aklae borders. See Fig. 6

Harrender: This overshot technique results in a shape that looks like an H. Two contrasting colors are typical, such as white with red, or dark brown. Weave three shots of a light color alternating with a dark color as in Kjerringtenner and ending with the light color. The central bars of the H are an overshot pickup with the dark color floating over three warp ends and under three so it joins the two legs of the H. You may have to go under or over one or two threads instead of three at the selvedge to place the float correctly. Alternate light tabby with dark floats until four floats have been completed. Weave the lower legs of the H in the same way as the upper section. See Fig.



Krabberender: The translation of this Norwegian word is "crab pattern". This is the same overshot technique as Harrender with the over-three and under-three warps for the central weft floats. However the floats occur so they are crossing a central dark weft with light bars on each side. This gives the six-legged effect. Sometimes your eye will see a series of small crosses rather than the legs. These are called "liten kors" (little crosses). See Fig. 8.

Fjord: This is woven in the same technique as Krabberender. See Fig. 9.

Korsbord: This word translates "crosses". Either four or six warp threads are used in crosses. Uneven numbers of threads will not work with the single interlock technique. For Korsbord the selvedge thread on the left must be in the up position. Lay in the pattern colors from left to right. The first thread in every block must be an up thread. The loose end threads hang down. Be careful not to extend the thread over too many of the down threads into the next cross. When sheds are changed, the thread on the right is up, and you'll be laying in your yarn from right to left. Weave the first color up to the color change. Pick up the second weft thread, wrap around the first and continue on with the second weft thread. Continue this way across the row with the third and fourth

colors (see Fig. 10). The weft yarn does not need to be bubbled when laying in the yarn for these short distances, but do not pull it in. Push it into place with your fingers.

Lynild: This word translates to mean "lightning patterns". An even number of threads must be used for each of the lightning patterns. To avoid confusing yourself, have the same number of threads in each lightning section when you first try this. See the chart below for possible sections in a piece containing 60 threads.

• ,	
lightning sections 3	number of threads per section 20
5	12
6	10
10	6
15	4
	ing Sections for end threads

With experience lightning sections won't have to be the same size, but they must always contain an even number of threads. Begin with the warp thread on the left side up. Starting from the left weave your blocks in different colors. Change sheds. Start weaving from the *left* again. Pick up the up thread to the right of your butterfly. Colors are usually woven in the shed in a specific order and repeated in the same sequence across the width of the piece. Start a new butterfly on the edge so that the lightning patterns

stay the same width. By picking up the thread behind the butterfly each time you progress from left to right the lightning will move in that direction. At the point of the lightning, you want to be sure the point isn't buried in the weaving by picking up the thread in back of the butterfly. The point will be more visible as the lightning pattern goes in the opposite direction. See Fig. 11.

COMPLETING TECHNIQUES:

A completed aklaevey piece is reversible with all yarn ends woven in. To finish an aklaevey, weave in all the yarn ends by inserting the yarns with a tapestry needle running parallel to the warp threads between the weft threads. Press the piece firmly with a very wet press cloth. Press it as flat as possible. Maneuver the edges and bumps to arrange the piece in proportion and with even edges.

Add a bias tape sleeve at the back top of the aklaevey for hanging or turn under the top of the aklaevey to create its own sleeve. Choose a decorative hanger or simply insert a dowel in the sleeve to provide firmness for hanging. Fringe at the top may hang down the front of the piece or be concealed by the sleeve.

Completing an aklaevey is a slow and sometimes tedious process, but the finished piece is a strong tapestry that reflects the historical roots of the Scandinavian people.

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Kielland, Thor, Norsk Billedvev, 1950-53. (No Author Given), Husflid, Norges Husflidslag, O Slottsgt. 8, Oslo a, Norway.

YARN SOURCES:

The Unique 211/2 East Bijou Colorado Springs, CO 80902

The Weaving Works 5049 Brooklyn Avenue Seattle, Washington 98105

Damascus Pioneer Craft School 14711 Southeast Anderson Road Blackamas, Oregon 97015

Glimåkra Looms 'n Yarns, Inc. P.O. Box 16157 Rocky River, Objo 44116

The Willow Tree 1112 North 159 East Avenue Tulsa, Oklahoma 74116

Husflid, Mollerst 4. Boks 38. Oslo I, Norway

YARNS:

Rauma Prydvevgarn (6 over 2)-size for sampler size aklaevev

Rauma Aklegarn—for larger pieces of aklae Vamsegarn-for large overshot Ullspiessgarn

Warp yarn-cotton seine twine 12/6 or linen 8/3

ABOUT THE AUTHOR: Sonja A. Irlbeck is a weaver by avocation and has been weaving for the past eight years. The Scandingvian influence came from her Norwegian grandmother, Gunhild Jacobson, Sonja's burgeoning interest in aklae came about when she received some aklaer from Gunhild's sister who resided in Norway. Her desire to learn the technique led her to the Norwegian American Museum in Decorah. lowa. The resulting article is in memory of her grandmother.



1. "Quartet from the Magic Mandala", 34" x 43", tapestry on leno ground.



4. Pre-Columbian fragment of complementary warp weave with a recursive bird motif; courtesy of Philadelpha Museum of Art (given by Moss Rose Manufacturing Company.

GIFTS FROM ANCIENT PERU by Ulla Nass

photos by Sylvan Nass

The documentation of historic and ethnic textiles has increased rapidly in the last 50 years. Modern weavers now have access to many fine collections and libraries that specialize in fabrics from all corners of the world and dating back to prehistoric times. There is much to learn from our rich heritage and each of us can find areas that will bring us closer to our own special goals, whether they be technical, artistic, or both. I have found a particularly rich source of inspiration in the pre-Columbian weaving of Peru. Two studies have resulted from this: Harness Lace, 1977, and Weaves of the Incas 1980.

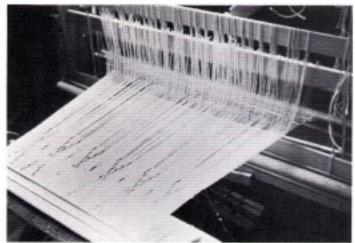
"Harness Lace" is a method of weaving leno, heddle controlled the

Andean way, but adapted to the floor loom. I use this method to weave tapestries on leno ground (Figs. 1 & 2). This weave was used in both Ancient Peru and China, mostly for richly patterned garments. My use of it with unspun wool tapestry inlays may be new—but I doubt it! It is my experience that almost anything we "invent" has been done before in some other time or place.

My warp for the tapestries is usually mercerized cotton 10/2 and the leno weft is the same yarn. The cotton threads form a leno ground that becomes almost completely hidden by pattern weft of unspun wool. The wool is Corriedale fleece from a neighboring farm that we prepare

ourselves, and I have wonderful support in my husband, who has become quite a dye-master. We use acid dyes, mainly because much of the dyeing is done in the kitchen, and the acid dyes are the least toxic of all. (Even natural dyes often require mordants that are highly poisonous.)

The leno ground serves several purposes in my pieces: It gives the tapestries a thick, soft texture (Photo 1). The regular leno weft prevents the wool inlays from packing together very closely, thus making the weave much lighter than an ordinary tapestry. This is an advantage in large weavings, where the weight of the piece can cause all kinds of hanging prob-



 Silk shawl in fancy gauze being woven on a floor loom without a reed/beater.



3. Silk blouse in fancy gauze, leno and plain weave.

lems. The leno grid also gives the weave a characteristic regular texture that lends itself beautifully to geometric designs. Last but not least the leno grid solves the perpetual problem of tapestry interlocking: *no* interlocking is necessary between the wool inlays!

Fancy gauze, the "ultimate" lace weave, is a further development of ordinary leno. In this weave each warp thread crosses its neighbor alternately to the left and to the right with each succeeding weft (Figs. 3a & b). Also called "three-thread leno" the weave was used extensively in Ancient Peru, and many beautiful examples have been found in the grave sites along

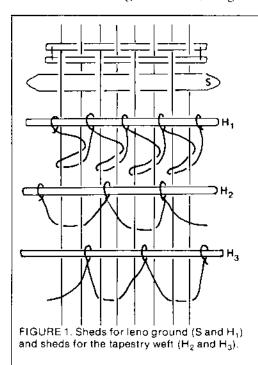
the dry Peruvian coast. I found it very enjoyable to weave, well worth the trouble of setting up (Photo 2). For the set up and technique, refer to *Harness Lace*.

ohotos by Sylvan Nass

Two heddle rods (3 shafts on a floor loom) are necessary to weave this fabric. Due to the structure of leftright crossings of warp threads, weaving must be done without a reed. A frequently moved stretcher is a must. The blouse in Photo 3 was woven with silk on a floor loom. In the open weave areas, pattern formation is carried out with a pickup stick that untwists some of the automatically crossed warp pairs in every second pick.

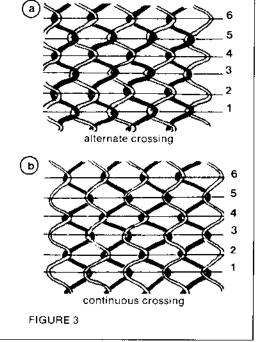
While working with the lace

weaves I became intrigued by the pattern of the old warp faced Peruvian weaves (Photo 4). They often have a figure-ground ambiguity that is of artistic interest. These patterns are deliberately constructed (like an Escher print) in such a way, that the figure can be seen as the ground and vice versa. It takes an unusual awareness of both geometry and psychology to do this, but I found that one particular class of weaves, namely the complementary warp weaves, has a structure that facilitates such compositions. The Andean method of picking patterns by hand (which is still in use) made me learn the backstrap technique which facilitates the picking method. The



- () - ()

FIGURE 2. Leno ground on which a discontinuous tapestry weft is woven by lifting first H₂ then H₃.





5. Two belts, one in the process of being woven on a backstrap loom; complementary warp weaves.

study (Weaves of the Incas) made me understand more, both about how threads behave and what kind of mental gymnastics are required to weave the beautiful patterns that were common in the Andes. I use this kind of weaving for ties, belts and straps, small or narrow

6. "Autumn Leaves", 46" x 67", tapestry with recursive composition; courtesy M. Malin, Esq.

pieces, where I want to have especially striking and intricate figures. My warp is usually commercial two-ply wool that I overspin for added strength. The weft, which shows only along the edges, is cotton "carpet warp" (Photo 5).

Perhaps the most valuable lesson of the complementary warp weave patterns, however, was my deeper understanding of the figure-ground perception inherent in any pattern. I have tried to develop this further in my large tapestries in more or less obvious ways (Photo 6).

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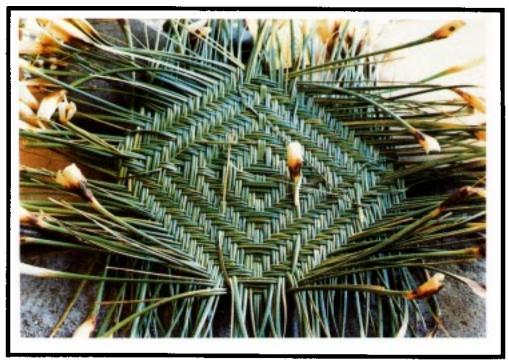
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ABOUT THE AUTHOR: Ulla Nass is a graduate of the University of Stockholm in Sweden and has studied at the Royal Academy of Fine Arts in Copenhagen, Denmark. She has also done independent studies under the advice of Curator Ann Rowe of The Textile Museum in Washington, D.C. and Dr. Junius Bird of the American Museum of Natural History in New York City.

She has taught art and weaving in the Philadelphia area since 1973 and has given lectures and workshops in Pennsylvania, New Jersey and Delaware. She has exhibited her work in numerous shows and has received many prizes, including the Kathryn Wellman Award in 1974. Last year she completed five tapestries commissioned by Graduate Hospital at the University of Pennsylvania.

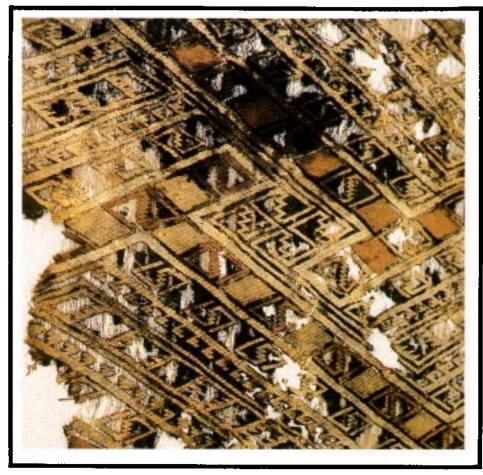
Ulla has published articles in S S & D and the Swedish magazine Hemslojden. She has also written two books, Harness Lace which appeared in 1977 and Weaves of the Incas, published in 1980.



1. Ring basket in process showing twill weave

SOUTHWEST INDIAN TWILL TAPESTRY by Betty Atwood

Twill tapestry is one of the least known of the many intricate weaves that were employed by the prehistoric Southwestern Indians. Sometime after 800 AD when the true loom was introduced into the Southwest from Mexico, multishaft twills were developed in that region. Although early Mexican and Peruvian weavers understood and wove twills, they were not developed to such a high degree as in the Southwest. The understanding and evolvement of this weave can be said to be as great an advancement in prehistoric weaving technology as the Jacquard loom was in the 19th century or the shuttleless loom in our own time. Kate Peck Kent remarks in her very knowledgeable and complete work. "The Cultivation and Weaving of Cotton in the Prehistoric Southwestern United States" that "The prehistoric Pueblo peoples of central and northern Arizona and New Mexico have earned a distinctive place for themselves in the annals of New World weaving through their exploitation of the mechani-



2. Blanket fragment from Grand Gulch, Utah

cal possibilities of their loom."

For many centuries before the true loom appeared in the Southwest, baskets were plaited into twill patterns from yucca leaves. Contemporary Pueblo weavers still make this same yucca ring basket (Photo 1). Plain, reverse herringbone and diamond twills were used to enhance these handsome and utilitarian baskets. It is probable that prehistoric weavers were inspired by these designs which led them to conceive and execute many different twill patterns on the frame loom. Using from 3 to 5 heddle rods plus a shed rod they wove fine cotton threads into twill fabrics that were used for wearing apparel, bags and blankets. Their loom was probably an upright frame loom nearly identical to the Pueblo and Navajo looms of today. Although the Navajo weavers use wool to warp and weave their rugs, the prehistoric weavers, as later Pueblo people do, used cotton spun on hand spindles weighted with clay or stone whorls. To make the designs even more complex, they learned not simply to pass a weft through the shed but also to weave twills as interlocking tapestries using 3 or more wefts in one shed. Following the angles made by the twill weave, they outlines the "eyes" of the diamond twill or wove

diagonal stripes in zigzag designs that stood out against the background. Another variation they invented was changing sheds partway through a weft shot so the angle of the twill might change—making what is called an irregular twill. Without changing colors they achieve a tapestry effect.

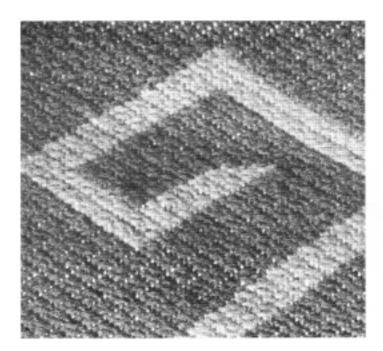
One of the finest examples of twill tapestry from the prehistoric period was discovered at Grand Gulch, Utah (Photo 2). It is now in the collection of the American Museum of Natural History in New York. It is thought to be a part of a blanket and is entirely woven in interlocking diamonds and zigzags in black, brown and natural cotton. It is woven in a three shaft diamond twill.

After observing such a fine example as the Grand Gulch piece, we can draw the conclusion that the weavers of this period were truly masters of the twill weave. Other excellent examples have been found in a widespread area of the Southwest where arid conditions have allowed the fabrics to be preserved. A fine piece of irregular twill tapestry, which has been identified as a breech cloth, was found in the Tonto cliff dwellings in southern Arizona. Diamond

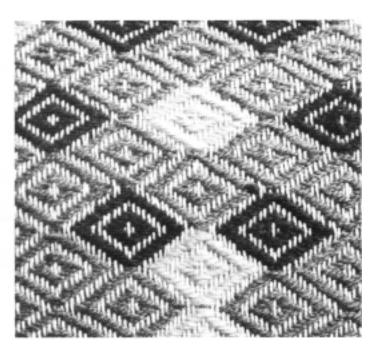
twill tapestries were discovered in Tularosa Cave in the Gila River area of New Mexico and in Montezuma Castle in Arizona. Many twills known as "Anasazi twills" for the people that wove them have been found in Southern Colorado and northern New Mexico-Arizona area. These are distinguished by the patterns woven in weft stripes in black, brown, red and white.

Although the finished result of prehistoric twill weaving might be the same as what contemporary handweavers can produce, their heddle-rigged looms worked on a slightly different principle. That is, each heddle rod picked up all of the warp threads needed to be raised for each weft. On handlooms today we raise two or more shafts to achieve the same result. Lifting one heddle rod at a time was a simpler and less time-consuming action for this type of loom. Navajo twill weave saddle blankets—a probable outgrowth of Pueblo twills-employ this same system.

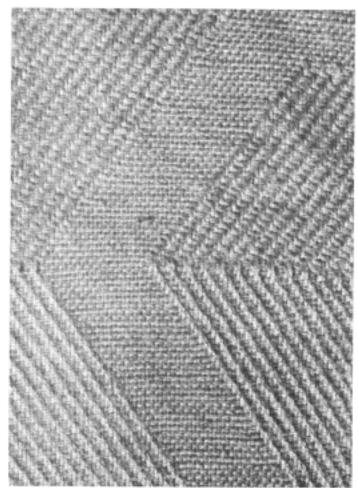
In experimenting with twill tapestry technique, I have tried 3,4 and 6 shaft diamond twills as well as straight twill. The simplest twill is the three shaft diamond twill which gives small diamonds but can create overall designs to cover larger areas or blocks of diamonds

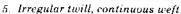


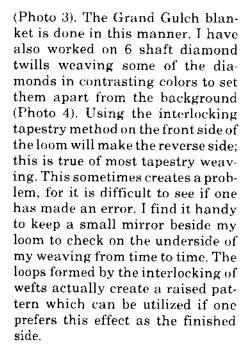
3. Twill tapestry, three shaft diamond



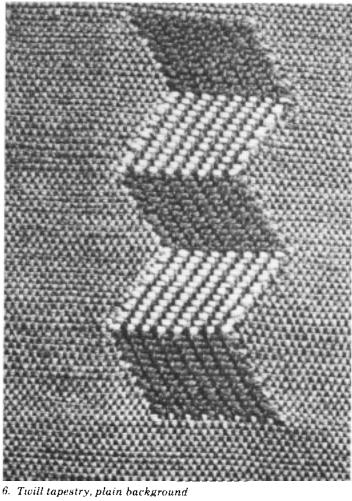
4. Twill tapestry, six shaft diamond







Irregular twills are woven in a broken or modified twilling as contrasted with the regular or diamond weave. Examples from prehistoric sites show that twill tapestry motifs or patterns were some-



times woven on a plain weave or on a "modified" twill background. The heddle rods had to be manipulated part way through the weft shot to achieve the pattern. On contemporary hand looms, one can do this by changing the shaft lifts part way through a shot. Another type, that cannot be called true tapestry, is an irregular twill woven in this same manner but without making color changes (Photo 5). Many beautiful and complex patterns can be accomplished in this way. The contrasting textures of twill and plain weave make for a sophisticated and very contemporary-appearing fabric. The best part is that they can be done on a four shaft loom set with a straight draw.

One of the experiments I tried with twill tapestry was to set a twill motif against a plain background. Using a 2/2 diagonal twill I made a zigzag design by changing both color and direction of the twill at certain points. This created an

optical illusion effect that literally seemed to jump out from the fabric. This has led to more experiments with optical effects in this technique and so on-and so on. There are many, many more possibilities with this basically simple but truly native American technique. I urge other handweavers to give it a try!

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ABOUT THE AUTHOR: Betty Atwood, a native Vermonter, is an Associate Professor at the University of Vermont where she teaches weaving and design. Her interest in Southwestern Indian Textiles has developed over many years of travel and study in the Southwest including two sabbatical leaves spent there. She has given many workshops on Southwestern techniques and shown her work widely throughout the country. She is currently a partner in a handweaving supply shop in Shelburne, Vermont where she lives.

SUMBANESE IKAT

by Farrell Hannon

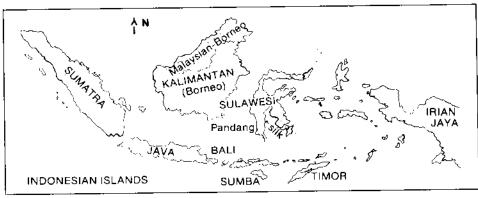
Nearly all the islands of Indonesia, except Bali, produce only warp ikat, all of which is woven on backstrap looms. Except for Sumba, all use geometric, floral, or abstract patterns. In Sumba, however, weavers are still influenced by their former animistic religion, and use animals, birds, and humans as designs.

Natural dyes are used in most of Indonesia. Indigo, which grows in abundance in the islands, is used the most. Ikat weavers also use the oil of the kombu nut and the bark of the roots of the sinti tree. These produce a creamy yellow and a rusty red.

Cotton is still grown on some of the islands and is spun and used for weaving. However, much of the thread now used is imported, mainly from Hong Kong. Except for the island of Sulawesi where silkworms are raised and the silk is spun and woven by the Buganese, all of the warp ikat of the other islands is cotton.

In order for me to understand Indonesian ikat fully, it was necessary to learn the process of making warp ikat as well as Balinese (weft) ikat which I had previously studied. I decided that the best place to study Indonesian warp ikat was in Sumba as it is the most typically "Indonesian" of all the warp ikats produced there, differing greatly from warp ikat in any other part of the world. I went to Sumba in the spring of 1981.

Upon arriving at the airport at Waingapu, the capital of Sumba, my friend and I were greeted by long lines of Sumba blankets and hinggis (shawls) strung on ropes



tied between trees, and were soon surrounded by numerous salesmen intent upon selling their wares.

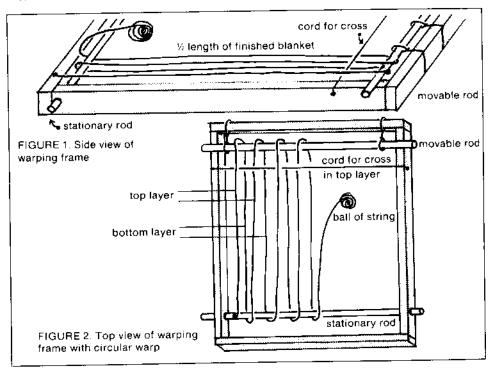
The weaving center nearest to Waingapu is the very tiny village of Prailu, only a short bus ride from the hotel where we stayed. Here we saw blankets being warped, dyed, and woven. On another day we visited a "weaving factory" (a group of hired weavers) in the town of Melolo. Melolo is a town half a day's journey by bus from Waingapu, over probably the worst road in existence. We were cordially welcomed to this "factory" by Uncle Lali, the uncle of David Ely, a young Sumbanese textile buyer from Bali, whom we had met earlier.

Hinggis (shawls) and supplementary warp sarungs, as well as blankets, are made in all the weaving centers.

The finishing of the ends of the hinggi is unusual. An inkle band is woven along the edge, the warp ends of the hinggi forming the inkle weft. This makes a neat, tight edge that will not ravel (Photo 1).

The making of Sumba blankets is the main occupation of Sumbanese weavers (Photo 2). This is a slow and laborious process. The thread for the warp is first wound from skeins into balls. Two women wind the warp, passing the ball of thread from one to the other and passing it around poles set into each end of a heavy frame. This frame is half the length of the finished blanket. A cord is tied across the frame near one end and the thread is passed alternately over and under the cord to form the cross (Figs. 1 and 2).

The warp is also divided, usually by finger crocheting, or sometimes by twining, around the number of













- Clockwise from upper left:
 1. Hinggi with inkle edge, detail
 2. Sumba blanket with center pattern
 3. Tying Sumba blanket at Melolo
 4. Sumba blanket, tied, ready for dyepot
 5. Dyeing with indigo
 6. Dyed warp, ties removed
 7. Dyed warp, being made ready for the
- 7. Dyed warp being made ready for the loom. Prailu.
- 8. Weaving a Sumba blanket. End of loom rests on notches in supporting posts of floor. Prailu.



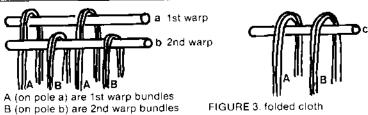
photo by Richard Reichart (4)







SUMMER 1983



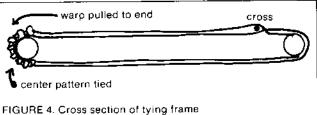


FIGURE 3. folded cloth FIGURE 4. Cross

threads needed for the ikat pattern. When the frame is warped with the correct number of threads, the ikat bundles will also have been separated. A lease cord is now inserted on each side of the cross and tied together at the ends. A second warp, identical to the first, is prepared in the same manner, but using a different color of thread to crochet or twine around the pattern bundles. The tension on the poles is released and the first warp is placed over the second warp, keeping the bundle separations directly on top of each other. Then the ikat bundles from the two warps are twined together, so it is easy for the woman who ties the pattern to pick them up together.

Some Sumba blankets show a vertical fold. To make the vertical fold, short poles (a and b) are inserted in each end and the long poles withdrawn. The short poles are folded together, and a third pole (c) is inserted, picking up warp bundles from first one warp and then the other, until all the warp bundles are on one pole at each end (Fig. 3). This folded warp is now inserted into the tying frame.

For the other blankets the two warps of the pair are separated after they have been dyed and each warp is woven separately. After weaving they will be sewn together down the center to make one blanket.

The tying frame is very similar to the warping frame, except that the pole at one end is not inserted into a hole in the frame, but fastened by cord loops, thereby making it possible to adjust the tension (Photo 3).

Some Sumba blankets and hinggis have a plain colored center where the warp threads go around one end of the poles. However, the better blankets have the centers decorated. When this is to be done only the top layer is tied into a pattern, in an area large enough to go around one end pole (Fig. 4). The warp is now pulled around so the tied pattern goes around the pole. The lease cords and ikat separations are at the other end pole. The tyer now proceeds to tie both top and bottom layers together into the pattern she desires, picking up the correct number of threads by checking with the separated bundles. As the tying proceeds the bottom pole needs to be loosened from time to time to keep the tension the same. This is easily done by adjusting the cord loops.

Ties are made from the fine inner bark of a tree. They are kept moistened as they are used. When the warp is tied a heavy cord is passed through the end opposite the center and the poles are removed. It is now ready for the dyepot (Photo 4).

Since indigo is the main dye used the dyeing is a slow process. The depth of the color depends upon how many times the thred is dyed and then exposed to the light. Many of the colors found in Sumbanese textiles are produced by kombu and sinti bark, as well as other shrubs, and then overdyeing with indigo.

After the warp has been dyed (Photo 5) and is ready for weaving, it is replaced in the tying frame and the ties are removed (Photo 6). Unless the blanket is woven with a fold the two warps of the pair are now separated and each one woven separately. If the warp is for hinggis, one woven piece will be used for a shawl and other used to wrap around the hips.

After the ties are removed and the warps separated, one of them is laid out on a bamboo frame and the lease sticks and heddles are put

in (Photo 7). It is then placed in the backstrap loom. There is usually just a crude support for the end pole. Sometimes the support is part of the foundation posts of the house, and sometimes the end pole is simply fastened to the floor joists above the weaver. The weaving generally takes place under the house where it is cool, the floor being about four to five feet above the ground (Photo 8).

The weave is a warp faced rep, the weft threads generally being heavier than the warp, which is very fine, about 60/21 think. Part, or all, of the weft is dyed, often in two different colors; this produces a variation in the colors of the ikat patterns.

Sumbanese ikats are considered the finest of the warp ikats of Indonesia. The most intricate and beautiful of them are never sold, but are used for royalty or people of high position.* It takes many months, often more than a year, to make a fine Sumba blanket.

Tying Frame at Melolo was simply two poles propped into notches in the walls.

*Kahlember, Mary Hunt, Textile Traditions of Indonesia. † 1977. Published by the Los Angeles County Museum of Art, 5905 Wilshire Blvd. Los Angeles, CA 90036.

ABOUT THE AUTHOR: Farrell Hannon has a BS degree in Art from Northern Michigan University and an MA from Wayne University. She taught in Michigan schools for 25 years as an art teacher and later as an art supervisor. Though she has also been a painter and a potter, she has concentrated on weaving for the last 16 years.

She has studied weaving at Wayne State University and has taken many workshops. She has traveled widely in Europe and Southeast Asia, studying Balinese ikat with Jero Sukama in Bali in 1979 and warp ikat in Sumba and Sulawesi in 1981.

Farrell is a member of the Town & Country Handweavers Guild in Detroit and the Sheep to Shawl Guild in Menominee, where she has a summer studio and teaches weaving and gives workshops in ikat dyeing.

TYING WARP IKAT ON THE LOOM by Farrell Hannon

Warp ikat is generally measured and tied on a frame, as in Sumba. or, as in South America, on two sticks set in the ground, or, as in Japan, on a warping board where it can be both warped and tied. My problem was, how could I tie fifteen yards of warp for drapery material? It wasn't possible to construct a warping frame fifteen yards long, nor could I wind my warp on sticks set in the ground even though I had plenty of room. I was sure I would never get it all wound and tied before it got rained on. It is easy to make a hundred yards of weft ikat, as they do in Bali, but warp ikat is made in fairly short lengths.

Since I often put long warps on my loom, I wondered if it might not be possible to use the loom for making ikat ties.

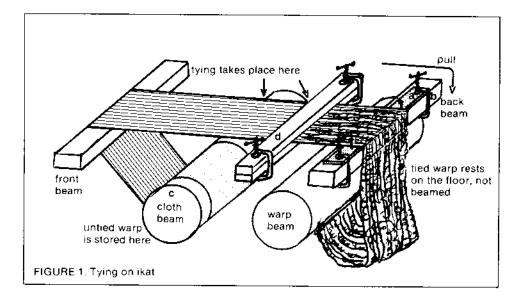
I first experimented with a sample warp three yards long. I first beamed the warp on the cloth beam, tied the warp and rolled the tied warp onto the warp beam. It was easy to tie, but rolling the warp over the warp beam caused the ties to bend and loosen, thus spoiling the pattern when it was dyed. To use the loom for tying the warp I had to find a way to keep the ties from bending or loosening.

I FINALLY WORKED OUT THE FOLLOWING PLAN (FIG. 1)

I drove two large nails into a piece of 1" x 2" (25 x 50 mm) wood a foot longer than the width of the ikat material I wanted to make, I spaced the nails two inches (50 mm) farther apart than the width of the warp. This board was clamped to the back beam (b) of my loom with C-clamps. The warp to be tied was rolled on the cloth beam (c). To pull the warp forward after each tying, I devised a wooden clamp (d) of two pieces of 1" x 1" inch wood, each with a strip of foam rubber affixed to one side with rubber cement. These two sticks were fastened

together at one end, foam sides facing, with a piece of strapping tape. They could be clamped around the warp, the open end temporarily held together with masking tape until it could be clamped every eight inches (20 cm) with C-clamps. The warp, when loosened from the front, could then be pulled back and hooked behind the upright nails.

temporarily fastened to the cloth beam rod with rubber bands. The chain of warp was straightened and spread out over the back beam. The warp was now twined into bundles of six threads. (Five threads would have been the correct number for 40 epi but with this technique one has to work with even numbers of threads).



PREPARING THE WARP

Since I wanted a wide material (44" or 112 cm) with two repeats of the design, I made two warps of equal size. Each warp was 22 inches (55 cm) wide, 880 threads at 40 epi (160/10 cm). Each warp had its own lease sticks and an end stick for lashing to the cloth beam rod. It is important that the two end sticks be even. Narrow, flat sticks must be used as end sticks and both must be lashed together so they will go around the cloth beam as one. I found that lease sticks made good end sticks because they have holes in the ends and can be tied together.

Warp No. 1 was put through a raddle that was tied to the upright sides of the loom to keep it from moving forward. The end stick was The second warp was placed on top of the first warp, through the raddle, and the end stick placed on top of end stick No. 1. The two end sticks were then lashed together evenly and then were lashed on to the cloth beam rod.

A piece of cardboard was placed between the two warps to separate them; the second warp was also twined into bundles of six threads each. The cardboard was then removed and the warps were straightened out and rolled on the cloth beam as one. (It is easier, at this point, to have someone hold the warp while you beam it on. Since I have no help, I weighted my warp, as I always do, with sandbags, and wound it on as usual.) When all the warp was wound on I tied the ends to the back rod (the rod of the warp beam).

TYING THE WARP

The technique used for creating patterns is warp shifting by means of pattern loops which will be explained later.

By using pattern loops to shift my design I was able to tie the warp straight across, in horizontal stripes. I wanted the material to be yellow, orange, and brown. I used yellow 20-2 thread. I fied the warp in two inch sections, tying the yellow stripe first. (To keep the stripes even I marked the warp with chalk.) Using a different color tape, I tied the orange stripe next to the yellow stripe, and continued tying over the yellow tie so that there would be no chance of brown dye showing between the two stripes. The brown area was left untied. This stripe must be at least 2 inches (50 mm) in width in order to place the wooden clamp (d) around it. (Mine was 4 inches (100 mm).) Photo 1.

When the two stripes were tied all the way across the warp, the wooden clamp was placed around the warp just above the ties. The warp was loosened from the front and then pulled, by means of the clamp, far enought back to hook it behind the two upright nails (Photos 2 and 3). The warp was retightened from the front and the tying proceeded. I found, however, that it was sometimes difficult to tie close to the back beam, so it was easier to tie the second yellow stripe before moving the warp. The tied

warp piled up on the floor at the back of the loom, where I kept it covered to keep it clean.

When all the warp was tied, the lease sticks in each warp were replaced with cords, tied together at the ends. Cords were also placed at the ends where the flat end sticks were. The warp was now removed from the loom. As the tied ends were removed from the back rod they were tied together securely so they would not tangle when put into the dye bath.

DYEING

The darkest color was dyed first. After the thread was dry the ties for the orange stripes were removed and the thread was now dyed orange. Since orange is a component of brown, this did not affect the brown, except to make it brighter. After the second dyeing and drying, the last ties were removed and the warp was ready for the loom.

In using this method it is necessary to have the colors related, or changed to related colors. Otherwise it would be necessary to cover the first dyed area with tape before proceeding with successive dye baths. In a warp of this length this would be extremely time consuming.

PATTERN LOOPS

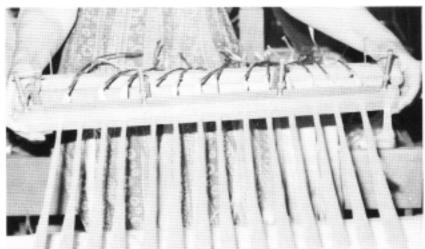
I wanted a shifted pattern in a lightning design (Photo 4 & 5). I used nails pounded in boards as a

jig for making thread loops with which to shift my warp threads into the desired pattern. I used two boards, $12''(30.5 \text{ cm}) \times 48''(122 \text{ cm})$ and marked out two 22-inch (56-cm) sections on each one. In each 22inch section I drew vertical parallel lines one-eighth inch apart across the width of the board (Fig. 2a). Over these parallel lines I traced my pattern—on all four sections, starting at line 1 on the left in each section. The lowest point of my pattern was three inches (76 mm) from the bottom edge of the board. If I had put my pattern closer to the bottom than this my loops would have been too short to tie. One inch up from the bottom of the board I drew a line the entire length of the board.

I now began putting nails in the boards over which to tie my pattern loops (Fig. 2b). On section A I began at the first line on the left, placing a small nail, or long brad on the line at the point where the pattern began. I also put in a nail on that same vertical line one inch up from the bottom, where it crossed the long horizontal line. On section A the second nail was placed where the pattern crossed the fifth line, and also, one inchfrom the bottom. This continued across the board in section A, putting nails in every fourth line, both at the crossing point of the pattern and also at the bottom where the horizontal and vertical lines crossed, one inch up from the bottom.



1. Beginning with a snitch knot 2. Grasping the wooden clamp
42. SUMMER 1983 WJ



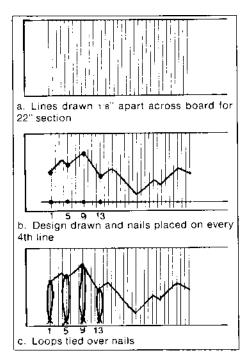


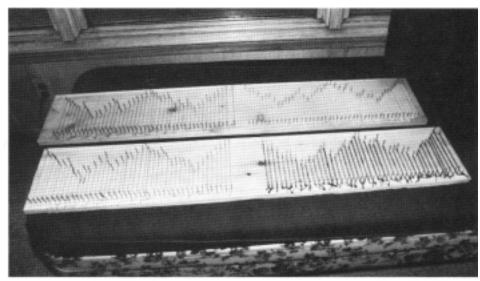
FIGURE 2

On section B I began the nails on the second line where the pattern crossed, and also at the bottom. I continued across this section, every fourth line from line 2.

The second board had pattern sections C and D on it. On section C I started the nails on the third line, as well as one inch from the bottom, as before, and continued across this section, putting in nails on every fourth line all the way across. On section D I began where the pattern crossed line 4, and continued across, putting in nails in every fourth line from there. (It is not possible to use one pattern board and put in nails every eighth inch as the boards would split.)

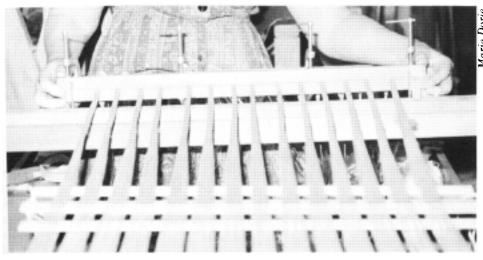


4. Finished ikat weaving



5. Pattern boards

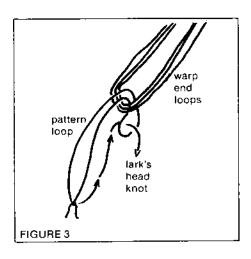
Using four different colors of carpet warp, gray, yellow, black, and



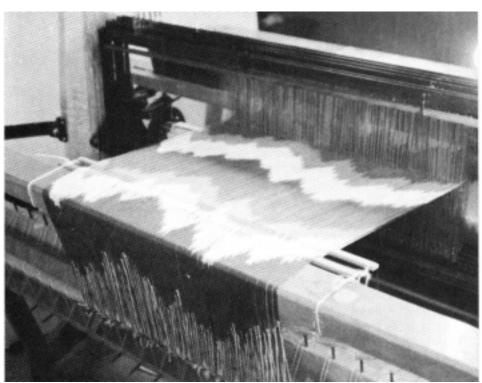
3. Pulling the wooden clamp

red, one for each pattern section, I tied loops around the nails, each loop the length of the distance from the nail where the pattern crossed, to the nail at the bottom of that line. The shortest loop was 3 inches. Any loop shorter than this would have been difficult to tie to the warp with a lark's head knot (Fig. 2c).

The warp was pulled to the back of the loom, but not over the back beam. The end rod was fastened temporarily to the back warp rod of the loom with rubber bands to keep it straight. The warp was weighted down at the front of the loom. Taking the first loop on the left from section A I fastened it to the first three warp loops (6 threads) at the



left side of my warp, with a lark's head knot (Fig. 3). I continued with loop No. 1 from section B next, the first loop from section C after that, and finally loop No. 1 from section D. I now had four pattern loops attached to my warp: loops No. 1 from each of the four pattern sections-A, B, C, and D, one each of gray, vellow, black and red. I continued putting on the loops, now using No. 2 loops from each pattern section, etc. Since each pattern section was tied with different colored loops it was easy to go back to the proper place if an interruption occurred.



6. Pattern threads tied to warp ends

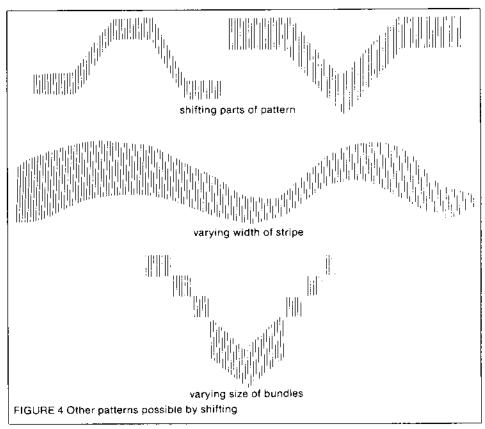
When all the pattern loops had been fastened to the warp ends, these loops were then threaded on a rod, and the temporary end rod removed from the warp. The new end rod, on which the pattern loops were threaded, was lashed to the back beam rod (Photo 6). The warp was now ready to be rolled on the back beam. The pattern loops

pulled the warp threads to varying lengths according to the length of the loop. The ikat stripes that had been tied straight across the warp were now shifted into the desired pattern. Care had to be taken when beaming on the warp to see that the threads were pulled evenly, as the pattern shifts along the entire length of the warp.

After beaming all the warp on the loom and tying it to the cloth beam rod, the weaving proceeds as usual.

Any pulled pattern can be produced by the loop method (Fig. 4). Some parts of the warp may be shifted and some left. However, if only part of the warp is to be shifted, it is wise to tie loops of equal length to the part you do not want shifted so they will all move together, as the smallest loop that can be tied is two inches, unless your pattern calls for that much differential between shifted and unshifted parts.

The ikat stripes may also be varied in width; this will also change the pattern somewhat. Some warp bundles may be smaller (thinner) than others, allowing another variation in the pattern. However, whatever the size of the bundle you start with, it must be kept the same size (not necessarily the same length) along the entire length of the warp.



AN INTRODUCTION TO COMPUTERS FOR WEAVERS by Earl W. Barrett

PART2: WHAT'S INSIDE THE BOX?

In the first article of this series we looked at computers from an external point of view, learning about some of the many things they can do and about the various mancomputer interfaces or I/O devices. It is now time to take a short and not overly-technical look at what goes on inside a typical personal computer.

In the previous article I frequently used the word "information" to refer to the inputs to, and outputs from, a computer. We saw that information took many forms; typed words, numbers, pictures on a video screen, etc. In the computer, however, information exists in only one form, viz., a pattern of low electrical voltages at various points. The function of all I/O devices is to transform the various kinds of outer-world information to or from these internal patterns.

All personal computers belong to the class of **electronic digital** computers. "Electronic" means that all the actions taking place involve only changes in electrical voltages or currents, without any moving mechanical parts. "Digital" imposes the further constraint that these voltages take on only certain discrete values.

OF IMPS AND SWITCHES

The fundamental electrical unit of a digital computer is shown (in idealized form) in Fig. 1.

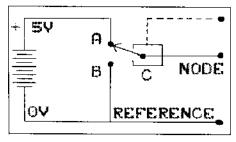


FIGURE 1. Basic cell or fundamental unit of a digital computer.

The group of parallel short and long lines at the left of the figure is the standard symbol for a battery. It may be an actual battery in a portable computer, or a power supply that transforms the house current (115 volts alternating) into a steady (direct) 5-volt source. The symbol at the right is a switch. When the arrow is in contact with point A, as drawn, the **node** will be five volts positive with respect to the reference, or "ground", which is common to all units in the computer. When the arrow is in contact with B, the node is connected to the reference and is therefore at zero volts.

So far so good, but what flips the switch? One can fantasize that there is a little imp inside the box C who moves the switch to A or B depending on some signal that comes to him along the dotted line. In some very primitive computers, this imp was a combination of an electromagnet and spring. When a current passed through the coil of the electromagnet, the moving arm was moved to Point A; when the current was cut off, the spring pulled the arm into contact with Point B.

In modern computers, the functions of both imp and switch are handled by a **transistor**, similar in principle to those in a radio, but far smaller in size. The transistor switches the node from A to B in response to changes in voltage at a third input terminal, or **base**, in a few nanoseconds (billionths of a second).

So far, this is not very impressive. The key point, however, is that the voltage applied to the base (dashed line in Fig. 1) may be that existing at the node of another cell. Thus, when large numbers of such units are linked together in a purposeful

way, very complex patterns can be created.

There is a fairly good analogy between the basic unit of the computer and a nerve cell in the brain. Nerve cells produce electrical impulses at their output nodes in response to electrical and chemical stimuli from the nodes of one or more other cells. The functioning of the brain testifies eloquently to the complexity that is possible when many billions of simple units are organized into networks.

At this point we may leave the electrical details to the computer designers and move to another level of abstraction. We will simply say that whenever a node is at 5 volts its state is represented by the numerical digit 1 (one), and whenever it is at zero volts its state is the digit 0 (zero). From this point on, then, we only deal with these digits; all information inside the computer can be represented by patterns of 0's and 1's.

BITS, NIBBLES, AND BYTES

If we have only a single cell, there are only two possibilities, 0 or 1. But if we associate two cells together, then there are four possibilities, namely, 00, 01, 10, and 11. With three cells we have eight possible permutations: 000, 001, 010, 011, 100, 101, 110, 111. As we increase the number of cells, it is easy to see that the number of possible states grows as a geometric progression, i.e., adding one more cell doubles the number of possible distinct states. Thus, four cells give 16 states, 5 give 32, 8 give 256, 16 give 65,536, and so on.

If we now imagine our group of cells to be arranged in a row and read their 1's and 0's from left to right, we find a similarity with ordinary numbers. Consider the set 10011101, for example. If we take the rightmost digit at its face value of I, the next digit to the left as its face value multiplied by 2, the next again to the left as its face value multiplied by $2 \times 2 = 4$, and so on until we reach the last digit on the left and multiply it by 128 (2 to the 7th power), and add up these products, we get

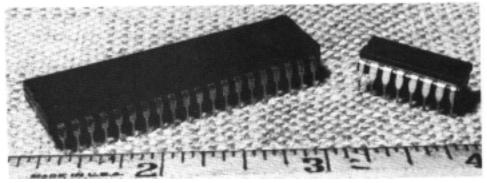
 $\frac{1 + (0x2) + (1x4) + (1x8) + (1x16) +}{(0x32) + (0x64) + (1x128) = 157}$

We see from this exercise that any ordinary integer number (such as 157) can be represented by a unique set of the two digits 0 and 1, and, therefore, by the state of a set of cells in the computer. We can therefore regard such a set of 0's and 1's as a kind of number. Just as ordinary numbers are called decimal (from Latin: decem = ten) because ten is the base which is raised to the power of a digit's position, the numbers made from ordered sequences of 0's and 1's are called **binary** (Latin: bini = two by two) numbers, with base 2.

The facts that: (a) any number can be represented in binary form using only the digits 0 and 1; and (b) that these digits can be expressed physically as two distinct voltages, are what make the digital computer a reality.

Binary numbers have their rules of arithmetic just as decimal numbers do. We will not go deeply into them at this time except to give the addition rule: 0+0=0, 0+1=1, 1+1=0 and carry 1. Note that this is much simpler than decimal addition; this is generally true of binary arithmetic.

The individual 0's and 1's in a binary number are called bits (a contraction of binary digit). A binary number with four bits is a nibble; breaking up larger numbers into nibbles is a convenience for human programmers. We will meet nibbles again in a later article dealing with programming languages. A more important class of binary number is the 8-bit one, called a byte. Its importance lies in the fact that most personal compu-



1. Two integrated circuit (IC) chips; the large chip at the left is a $Z80\ CPU$, the small one is a $4116\ RAM\ chip$.

ters on the market up to the time of writing (March 1983) are built to handle data one byte at a time. Larger "minicomputers" for scientific, engineering, and business are designed to work with 16-bit and 32-bit numbers, while the big "mainframes" may use 32-bit, 48-bit, or even larger numbers. Any number, one or more bytes in length, that is handled as a single entity by a computer is referred to as a word. The word length, in

grasp than other artists/craftsmen. Just think of a binary number as a description of a pick of weft on your loom. Each 1 can represent a raised warp end and each 0 a lowered one (or vice versa if you prefer it). As an elementary example, two successive picks of plain weave on a narrow-band 16-thread warp can be represented on graph paper in the usual way, or by the binary numbers just below the graph in Fig. 2.

1010101010101010 = 43,690 DECIMAL 0101010101010101 = 21,845 DECIMAL

FIGURE 2. Representation of two picks of plain weave as binary numbers.

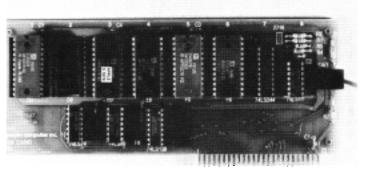
bits, is one factor that is used to characterize a computer; personal computers are mostly 8-bit machines and minis are mostly 16-bit.

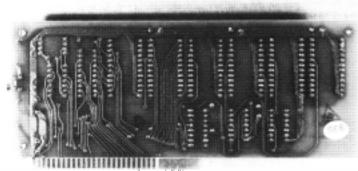
The word size of a computer is something that must be considered when shopping for a machine, because, other factors being equal, the larger the word length the faster the machine will run. This is especially true when the computer is used on jobs involving lots of arithmetic. Unfortunately, the price of computers goes up very rapidly as the word length increases. We will consider the relative merits of 8- and 16-bit personal computers in a later installment.

I hope that you have stayed with me throughout what is probably the least exciting (or most boring) part of this series. I do feel that what we have just covered is really fundamental to what will follow. Weavers should find the idea of binary numbers much easier to Such relationships between binary numbers and weave structures, threading, treadlings, etc., are used in devising weaving-simulation programs, as we shall see later.

CHIPS, BOARDS, AND BUSSES

A modern personal computer, about the size of an office typewriter and using as much electrical power as a 60-watt light bulb, can handle any job that a university or business computer of 25 years ago, occupying more than a thousand square feet of floor space and gulping energy at a rate equal to a hundred electric ranges, could do then. This marvelous feat is the result of breakthroughs in materials technology that have steadily reduced the size of transistors to the point where nearly half a million of them, with their interconnections, can be formed on a silicon wafer, or **chip**, about 1/4 inch (6.4) mm) square, at a cost (in mass pro-





2a. Printed circuit (PC) board; component side with chips in sockets... 2b. Same PC board; foil side.

duction) of a few tens of dollars per chip. The various functional blocks of a computer are made up of such chips (also called integrated circuits or IC's).

In order to protect them from damage, the actual silicon wafers are encased in plastic from which strong metal pins protrude; these pins make the necessary electrical connections between the chip and the external world. Photo 1 shows two typical IC chips. The large chip is a central processor unit (CPU) that is used in many brands of personal computer; the small one is a memory chip that holds 16,384 bits of data.

Physical support for the chips, as well as means for connecting them electrically to the power supply, to each other, and to I/O devices, is provided by a printed circuit (PC) **board.** This is a sheet of plastic or fiberglass that is first plated completely with copper; the pattern of traces needed to make the electrical connections is produced by a photoetching process using a master negative prepared by the designer. Photos 2a and 2b show the component and foil side of a circuit board.

The traces that actually carry data from one chip to another are grouped into busses according to the kind of information they carry. Communication between boards takes place through conectors (plugs or sockets); the extension at the bottom of the board in Photos 2a and 2b with the wide traces is really a plug that mates with a corresponding socket on the main board, or motherboard of a computer.

CPU, CLOCK, AND MEMORY: RAM AND ROM

A computer consists of a number of functional blocks, each consisting of one or more chips, connected by busses. The master block that directs the movement of information is the CPU. This single large chip is divided internally into several sub-units: registers that hold data bytes that are being used in the current operation, and a program counter that keeps track of the individual steps in a job. Some CPUs also contain the clock for the system; its function is to supply a continuous stream of alternating 0's and 1's to all parts of the computer at a constant rate or frequency. This rate varies with the kind of CPU; it lies between 1 and ten million alternations per second (abbreviated as 1 to 10 megahertz (MHz)). Generally speaking, the higher the frequency the faster the computer, although there are other factors that affect speed. In most computers the clock is a separate chip and its rate is determined by a quartz plate similar to those in digital watches. The CPU and clock can be regarded roughly as the brain and heart, respectively, of the computer.

It might be more accurate to call the CPU the forebrain or cerebrum of the computer. The rest of the brain consists of the memory, which holds not only data but also the program, or set of instructions to the CPU for manipulating the data.

Memory is divided into two classes. One kind of memory chip is so

designed that the CPU can both read the states of its bits, and also change those states, or write to the chip. Although the logical name for this kind of memory would be read-write memory, custom has decreed that it be called randomaccess memory (RAM). This means that the CPU can read from. or write to, any desired location in the memory without having to search or scan it from the beginning.

The other class of memory chip is one that the CPU can read from but cannot alter. This time logic prevails and it is called read-only memory (ROM). It is needed because, unless some instructions are available to the CPU when the computer is first turned on, it will just sit there forever and do nothing. So those things that the computer will do routinely whenever it is used are programmed into ROM by the manufacturer. When the CPU "wakes up" it executes instructions contains in a ROM chip that prepare it to do what the user wants.

It should be noted that ROM is also random-access; a user's program can tell the CPU to get its next order from any location in ROM as well as RAM. This can save a user who does his own programming a lot of time.

That's all for now. In the next installment we will see how the component parts fit together into an organized whole, how data entered at the keyboard are converted into bytes that the computer can chew, and as much more as we can find room for.

The Weaver's Journal

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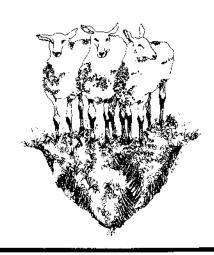
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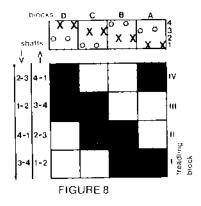
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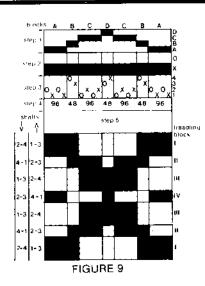
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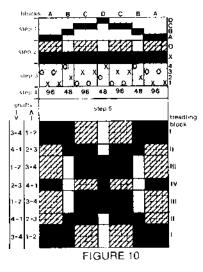


ERRATA

The Weaver's Journal Vol. VII, #4, issue 28, pp 18 and 19.







NEW JUST OFF THE PRESS

DOUBLE TWO-TIE UNIT WEAVES by Clotilde Barrett and Eunice Smith.

Double two-tie unit threading drafts give the 8-shaft weaver the best opportunity to experiment with a vast number of exciting weave structures without rethreading the loom. There are hundreds of variations of this threading system that can be woven. This book will help you to discover them all. The design theory is explained in a clear and comprehensive way. Each step is illustrated with complete drafts and samples. There are close to 100 photos of weave structures and projects, in color and black/white.

PLEASE MAKE CHECKS OR MONEY ORDERS IN U.S. FUNDS \$13.50 Colorado residents add 31/2% tax. WEAVER'S JOURNAL PUBLICATIONS, P.O. BOX 2049, BOULDER, CO 80306 U.S.A.

BOOK REVIEWS

by Clotilde Barrett

JAPANESE STENCIL DYEING—PASTE RESIST TECHNIQUES by Eisha Nakano with Barbara B. Stephan 1982. Published by John Weatherhill, Inc. of New York and Tokyo. 7%" x 10" format, hardcover, 143 pp., \$22.50 ISBN 0-8348-0169-8.

To quote from the preface of the book itself: "The aim of this book is to take the mystery out of an exciting dye method (ed.: Japanese stencil dyeing, known as katazome) that might otherwise seem overly complex or intimidating. Emphasis is on the concrete details of the resist process; every step, from the cutting of the stencil and the preparation of the resist paste to the final rinsing of the completed fabric, is spelled out as clearly as possible in the text and accompanying illustrations."

The authors achieve their goal splendidly. On the one hand the book deals with Japanese tradition: the tools, materials and designs used by traditional dyers; on the other hand the entire process is revealed to the westerner who has to start from scratch and who is given a wide range of choices from the traditional Japanese implements to their commonly found substitutes. (An international list of suppliers is given in the index.)

The text is pleasant to read, easy to understand and logical in the structure of the information it provides. The authors literally teach the entire process from start to finish and also include some related techniques for applying resist paste by squeezing it from a paper cone and the use of color paste. The technique of katazome lends itself not only to cotton, fabric from bast fiber, and silk, but also to paper.

The book is beautifully illustrated and has 20 color plates.

A well conceived volume such as this one will be extensively used and appreciated by all artists involved in surface decoration but will also be a welcome addition to the library of all those who love textiles, especially those who are sensitive to the beauty of Japanese traditional crafts.

LINEN HEIRLOOMS by Constance D. N. Gallagher © 1968. Published by the Charles T. Branford Co., P.O. Box 41, Newton Center, MA 02159, 8" x 11" format, hardcover, 108 pp. \$13.95

I had thought for some time that this book was out of print but a monograph recently published on the same subject by the Boston Guild (review in *The Weaver's Journal*, Spring '83) led me to inquire of the publisher. I found out that the book is still available. It is worth reviewing 15 years after its date of publication because I feel that there is a new awareness of fine woven cloth, of the use of linen and of weaving heirlooms to be appreciated by generations to come. There is a revived interest in old linens and woolens.

Sixty-two linen heirlooms dating from 1806 to 1864 have been analyzed by the author. All

the historical information has been noted and the fabric has been analyzed in detail. The patterns include twills, spot Bronson, M's and O's and huck, The complete drafts are given, as well as enough information to reproduce the heirlooms if one wishes to.

Most of the linen heirlooms described are now in the collection of the Smithsonian Institution.

The book contains some interesting information on early American handweaving, on the 19th Century handloom and on the care of fine linen cloth.

THE CUSTOM TOUCH, Creative Sewing Techniques by Mary J. Wealington. 1981, Gem Publications, P.O. Box 2499, Melbourne, FL 32901. 8½" x 11" format, 212 pp, paperback, \$14.95, ISBN 0-941832-00-7.

Another book on making patterns with the "flat pattern method"? Yes, and it is very worthwhile for a weaver who likes to make garments to take a look at this volume. With this book the home sewer is no longer dependent on commercial patterns which are expensive, do not always fit and don't come in all styles. The instructions call for making your own basic pattern first. This is explained step by step in a simple straightforward way, going into all the necessary details that insure a pleasing and comfortable fit. With this basic pattern in hand the home sewer can become an instant dress designer

The first chapter is about darts and teaches how to change the dart control from one position to another in order to create different designs. The author explains the potentials of gathers, pleats and tucks in order to enhance the feminine look or for special design effects.

The basic pattern may be altered to include the use of yokes, and can be adapted to many styles of collars and sleeves and to all types of dress, blouse, jacket, skirt and more.

Putting the pattern and the design of the garment under the control of the home sewer is particularly useful for the handweaver who must be able to choose the placement of darts, seams, pockets, fullness in order to show the handwoven fabric to its greatest advantage. This book will also help the weaver to figure out yardage exactly and to weave fabric in a width that has the most advantages.

The book includes many sewing tips such as making facings that fit, how to attach different types of collars, how to make points, curves, piping and much more.

The book is thorough and gets the reader all excited about well-fitting clothes and creative designs. Unfortunately the male sex is almost ignored. Maybe the author will some day publish a sequel which concentrates on pattern making for men. With this book, weavers who design women's fashions are sure to become more versatile and will be able to make patterns which reflect their imagination and creativity.

OVERSHOT WEAVING By Ellen Lewis Saltzman > 1983. Van Nostrand Reinhold Co., Inc., 135 West 50th St., New York, NY 10020.61/2" x 91/2" format, 130 pp, cloth edition \$17.50. ISBN 0-442-21371-9.

A lot has been written on overshot and most weavers have at least woven one project on an overshot draft. Yet, it seems that there are always questions to which answers are difficult to find. Unfortunately this book does not satisfy all the needs the overshot weaver might have and cannot be called a "classic" on the subject.

The best chapter of this book is the one dealing with the individual motifs that are repeated and/or combined to make an overshot pattern. The various motifs discussed are: cross/diamond, table, star, radiating motifs, leaf, wheel and straight line. There are suggestions for weaving a sampler in which all these motifs are threaded side by side and then woven as the blocks are drawn in. This familiarizes the weaver with the design potentials of overshot and encourages him to create his own designs. The beginning weaver may appreciate the easy steps by which overshot is derived from twill and find this derivation and the principles of weaving overshot as the blocks are "drawn in" easier to understand than in some other texts,

Other than that, it is hard for me to find much ground to discuss the merit of this book. The concept of plain weave, twills arrangements of the blocks, and "weaving as drawn in" are explained superficially and include quite a few misconceptions. The various treadlings involving the twill pattern shots with or without tabby binders have not been developed. There is no special study of the various weave structures that can be woven on an overshot threading, only Honeycomb is mentioned.

There are some good ideas in the planning of this book but the content seems to have had no time to mature.

HANDBOOK OF TIME SAVING TABLES FOR WEAVERS SPINNERS AND DYERS by Bettie G. Roth and Chris Schulz * 1983. Self published, P.O. Box 951 Elk Grove, CA 95624, 5½" x 8½" format, paperback, 41 pp., \$5.00.

The authors call this booklet "a weaver's best friend!" and claim "once you have used this handbook you will wonder how you got along without it." This may very well be true. It is a collection of charts (yarn counts, setts, etc., conversion tables, yardage, knitting needles, crochet hooks, metric, etc.), worksheets for warp calculation, classifications, and more. In short, it is a quick reference guide for questions that always pop up when spinning, dyeing, weaving and sewing.

I will probably keep my copy very handy, close to my worktable, because I know I will use it. A booklet like this one has been needed for a long time.

BACKSTRAP WEAVING by Barbara Taber and Marilyn Anderson : 1975. Watson-Guptill Publications, 7" x 10" format, 160 pp., hardcover, \$14.95, ISBN 0-8230-0422-8.

GUATEMALAN TEXTILES TODAY by Marilyn Anderson 1978, Watson-Guptill Publications, 8" x 11" format, 200 pp., hardcover. \$24.50. ISBN 0 8230 2152 0.

Although these two books have a very different title and content they really do complement each other in some ways and they do share an author, "Backstrap Weaving" is a technical book at a rather elementary level. Anyone interested in the technique will find here a set of clear, step-by-step instructions on how to build, set up and weave on a backstrap loom. The illustrations are good black/ white photographs and a few line drawings. Marilyn Anderson, the photographer and author/photographer of the second book has specialized in Guatemalan textiles. No wonder that the pattern weaves taught on the backstrap loom are biased toward Guatemalan techniques. This book is highly recommended for beginners and no previous knowledge of weaving is needed to get started and produce an assortment of useful and decorative woven projects.

In the preface of the second book, Marilyn Anderson makes a rather humble statement. "I do not intend to present an exhaustive or comprehensive study of Guatemalan weaving, but I do hope to convey a picture of representative weaving techniques and fabric structures, as well as to share my personal experience observing weaving". The author certainly accomplishes that most successfully and much more. "Guatemalan Textiles Today" can be enjoyed at many different levels. Weavers who have just learned about backstrap weaving and are ready for more elaborate Guatemalan patterning will appreciate the wealth of backstrap techniques described here. However, this book will be read and enjoyed just as much by textile collectors who want to learn more about the colorful weaving and embroidery traditions that are still being practiced in Guatemala today

The book is rich in photography (unfortunately most in black/white) of craftspeople at work, of typical examples of weaving and of a variety of tools from simple spindles to complex Jacquard looms

The first chapter gives a great deal of cultural

background and provides a better understanding of the people and their work. Chapter II deals with the essentials of weaving: fiber, spinning, dyeing and looms. Chapter III is the most comprehensive and explains the patterning techniques for a large variety of cloth woven on backstrap looms. The book deals also with treadle looms and embroidery techniques.

The purpose of the author of showing how Guatemalan woven pieces come about, is most successfully accomplished. This book is bound to increase the understanding and appreciation of Guatemalan textiles by all who read it.

IN CELEBRATION OF THE CURIOUS MIND-A FESTSCHRIFT TO HONOR ANNE BLINKS ON HER 80TH BIRTHDAY edited by Nora Rogers and Martha Stanley 1983. Published by Interweave Press, Inc., 306 N. Washington Ave., Loveland, CO 80537, 8%" x 11" format, 120 pp. paperback, \$12.50. ISBN 0 934026 11 4

Anne Blinks is a weaver and textile scholar who, through the great generosity of sharing, has made an impact on the life and career of many people, especially those in the textile field. It is a wonderful tribute to have compiled "papers" from a dozen of her friends and admirers and put these in book form. The mood for the celebration is set by an exquisite color photo of Anne Blinks. Even for those who have not met her. Anne becomes a dear

The contributed papers vary widely, from a very inquisitive analysis of a pair of archaelogical looms from Peru, a posthumous article by Junius Bird to a warmhearted and humorous story by Anne Blinks herself on how she finds names for the special sheep of her flock.

Other contributors are Nora Rogers with a scholarly article on rush mats that incorporate both twining and weaving: a very personal article by Mary Frame about an interesting family of knitters that she encountered in Peru. In fact. Peru seems to be a favorite topic. Ed. M. Franquemont has an article on pebble weaving in Peru and Mary Elizabeth King on sprang done in Peru.

Pat Hickman shares her research on a very ornamental Turkish needle lace while May Dusenbury presents a well-illustrated survey and good technical information on the Japanese braids which are done on round or square stands.

Martha Stanley studies the Bedouin Saha weave and applies it to her own rug designs. Virginia Isham Harvey writes about porcupine quill embroidery and shows how to substitute ribbons for quills to create fascinating surface ornamentation on textiles.

Jeanne Nissin has an article on breeding sheep for colored wool.

Each one of the articles in this book is a clear. well written and illustrated essay on a specific subject but the ultimate value of the book lies in the recognition that among us there is one weaver who continually discovers beauty in fiber and shares it with all.

THE BOOK OF KNOTS AND ROPEWORK by Eric C. Fry : 1977, 1978, 1981. First American edition published by Crown Publishers, Inc., 1 Park Avenue, New York, NY 10016, 7" x 91/4" format, paperback, 176 pp., \$4.95. ISBN 0517 54886.0 (Also available in cloth for \$10.95).

It has been some years since I last reviewed a book on knots. I therefore especially welcomed the volume

The book has no page numbers. Instead, each knot is numbered and the explanatory text and photographs are side by side, occupying one, two or more pages depending on the complexity of the project. The table of contents lists each project with its number: First the knots from the simple overhand knot to the monkey's fist; then rope splices, decorative knots and wire splices. Part II of the book deals with more complex decorative knots. plaits, sennits and the large knots which are used for mats

The instructions are easy to follow and each step is illustrated through clear photographs The special layout of the book by which all the information on a particular knot is visible at once without having to turn pages is especially appreciated.

Some of the more common knots are also described in other books. However, many of the knots, sennits and mats seemed new and exciting to me as for instance, the "thrum sennit" which is a fringe made from thrums.

Take a second look at the price. This book is definitely a bargain

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CHINESE KNOTTING by Lydia Chen and the editors of Echo Books. Published by Echo Publishing Co., Ltd., and distributed in the U.S. by Charles E. Tuttle Co., Inc., Rutland, VT 05701. 8%" x 11" format, hardcover, \$19.95. ISBN 0-8048-1389-2.

Traditional Chinese knotting produces highly decorative textiles that can be used as body ornaments, embellishments for clothing and household goods. Or they can be done for the sheer fun of creating figures (geometric and animal) with cording and string.

In this book this old Chinese folk art has been revived through beautiful examples and through step by step instructions on how to master the skills.

First there is a chapter on the origin and history of Chinese knotting. It points out the important role that textiles play in ancient civilizations. The knots are related to record keeping, to script, to rituals and beliefs. Knots were part of the Chinese wardrobe and their household objects.

The other chapters are instructions for learning the skill of Chinese knotting and developing it. The presentation and the illustrations are not equalled in beauty, quality and care in any other textile instruction book I know of. The photos are mostly in color and are exquisite. They show finished knotted projects as wearable art or as decorations for bags, chimes, flutes, pillows and more. The system of fine drawings used to show the steps of making the knot are extremely clear.

The entire book is well organized. There are eleven basic knots which have to be mastered first, then there are fourteen compound knots which teach the skill of combining knots. Finally the reader learns to make forty-one beautiful projects in Chinese knotting.

With this book. Chinese knotting is sure to become a popular craft in the Western Hemisphere.

COVERED THINGS by Judith Haroutunian 1981. Published by Fabricraft, P.O. Box 962. Cardiff by the Sea, CA 92007 8½" x 11" format, paperbound, 52 pp. Price not known.

If any one is looking for little projects or gift items that can be made with small pieces of woven cloth, this book may provide answers. In here one finds detailed descriptions for covering a loose-leaf notebook, an address book, a photo album. It also shows how to make a notepad cover, a stationery holder, a checkbook cover and a box. The basic projects can be fancied up by means of applique and padding. This project book does not mention "handwoven cloth" yet the detailed description, good illustrations and clear photos will give the handweaver a wealth of ideas for using up interesting fabric, or even designing cloth with covering things in mind.

THE HANDWEAVER'S PATTERN BOOK by Iona Plath: 1964, 1972, 1981, Iona Plath. This edition is published by Dover Publications, Inc., 180 Varick St., New York, NY 10014, 8" x 11" format, 127 pp., paperback, \$4.95. ISBN 0 486 24166 1.

This is a project book showing how to weave various types of cloth that have proven successful for projects related to interior design and fashion

The first chapter is similar to so many first chapters of weaving books and deals with warp and weft calculations, how to make a warp, how to dress a loom, how to tie up treadles, etc. Although such a chapter is not necessary in a book that is basically a recipe book, the text is clear and concise and will be a very helpful review for weavers with little experience. The beaming method described here is my personal favorite.

The projects fall under several categories; upholstery, pillows, decorative fabrics, curtains, rugs, placemats, fashion fabrics, stoles. Each category of goods is introduced with very useful information such as: standard size of a placemat, finishing of the woven cloth, advice on the width of the fabric, the choice of colors, yarns, etc.

The instructions to weave the cloth are easy to follow and are given for rising sheds in spite of the X's symbol used for the tie-up.

No brand names of yarns are given. For cotton the size is indicated; it can be converted into yds./lb. through a chart. Other yarns are usually given by their yds./lb. measure. The "fancies" are illustrated with a photograph and the yds./lb. are given.

The book lacks color but at a retail price of \$4.95 one does not wonder why.

Over the years this book has been a favorite for some weavers and was missed when out of print.

THE WHOLE CRAFT OF SPINNING—FROM RAW MATERIALS TO THE FINISHED YARN by Carol Kroll & 1981 Carol Kroll, Dover Publications, Inc., 180 Varick St., New York, NY 10014 8½" x 11" format, 50 pp. \$2.50 ISBN 0 486 23968 3.

This is an excellent publication to introduce people to spinning. The entire approach is a practical one and guides the reader through all the steps, from the purchase of raw fleece to the use of homespun yarns. The text is clear and easy to read. The illustrations are very good but, although I would call this book a well-illustrated one, there are times that an additional sketch would be very useful. The fiber most dealt with is wool but there are very good, although concise, chapters on spinning other animal fibers and plant fibers.

The chapter on obtaining a spinning wheel deals not only with new wheels but also gives advice on buying old and antique wheels.

During times when everyone complains how expensive things are, this book shows how to enjoy working with fiber on a budget: \$2.50 for the book, a few groceries to make a paste for spindle whorl, a stick, a handful of raw fleece, a crochet hook. That's all that is needed for hours of pleasure and a beautiful warm garment. Spinning is for everyone.

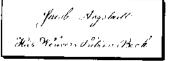
A HANDBOOK OF AMERICAN CREWEL EMBROIDERY by Muriel L. Baker: 1966. sixth printing 1982. Published by Charles E. Tuttle Co., Inc., Rutland, VT 05701. 6" x 9" format, hardcover, 67 pp., \$10.95, ISBN 0 8048 0230 0.

This is a well-illustrated book pointing out the characteristics of American crewel: simplicity of stitching techniques and a unique interpretation of motifs and patterns. The stitches and the motifs are well explained. Early American crewel was done on handwoven cloth.

KNITTING & CROCHETING FUN. Distributed by Charles E. Tuttle Co., Inc. Rutland, VT 05701, 10" x 71/4" format, paperbound, 40 pp., \$4.95.

Anyone who has scraps of colorful yarns left from weaving projects and has favorite youngsters around will be tempted by these quick and easy little projects: people. dolls, finger puppets, animals, mushrooms. Most are delightful gift items. The instructions for the 20 projects are clear and well illustrated.

JACOB ANGSTADT DESIGNS





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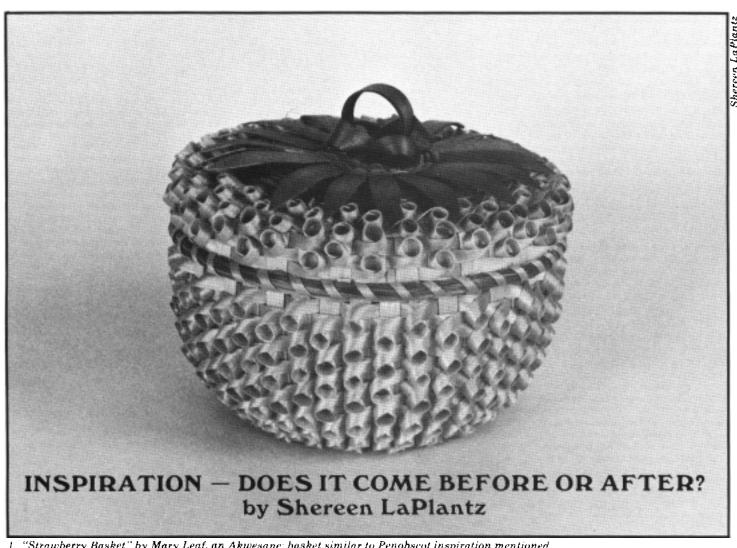


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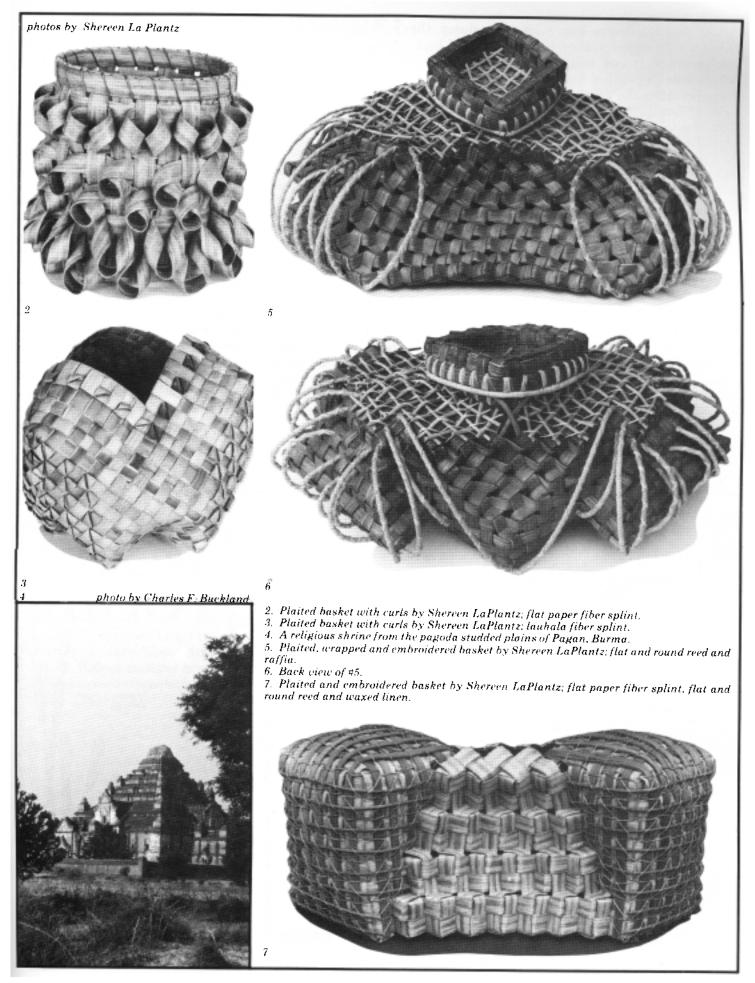
1. "Strawberry Basket" by Mary Leaf, an Akwesane; basket similar to Penobscot inspiration mentioned.

Both, or at least I've found it works both ways for me. My involvement with basketry began by seeing a basket (Photo 1). It was a Penobscot basket entirely covered with surface curls. It made that magical connection for me. All of my main concerns: the sculptural form, its need to be self supporting, and surface textures, were solved by that one basket, and solved beautifully. After several gestation years, I finally started producing baskets. Baskets that were an exaggerated memory changed to fit my artistic needs. By then it was like flood gates opening. A torrent of baskets, all covered with surface curls, came out of me. The shapes changed and are still changing. My connection was with basketry and with the textural surface. All this time, as I was making baskets, I kept looking at other baskets. How was this one finished? What kind of new curl

was this? Why line a basket? The baskets I saw and collected became my library, my information resource. These resource baskets weren't copied, but when I was stuck, when I needed a novel solution to get me out of a difficult spot, I could look around the room and remember several possible solutions. It was the same way with the surface curls. I didn't want to copy the Penobscots (the Penobscots are an Indian tribe living in Maine). Consequently I started looking. really looking, for surface curls. I found that most of the Algonquin-Iroquois tribes use curls, with minor variations between them. Then I found a Philippine basket using one of the same curls, but using it very differently. The search was on. So far I've found curls, not always the same curl, but certainly a relative, in most of the South Pacific, some of Southeast Asia

and Peru. After joking for years about finding curls on Rumanian baskets, I did find them in Austria and even in Germany as part of a molded plastic lampshade. The search continues. I expect to continue finding novel surface curls throughout my life.

Today that first Penobscot basket still has an impact on my studio work. I know that at some point I should grow onwards, leave my love affair with surface curls. Often I have thought it was over, that finally I had found a new form, a new texture, something that could captivate and delight me as much as curls. But not yet. This week I am playing with shapes, exploring possibilities and not worrying about the outcome. As I finish each of the shapes, all I can think is, "this basket needs curls, it's naked without them (Photos 2 & 3).



All of this illustrates how something can be an inspiration before the creation. It can still happen afterwards. When the inspiration happens after the creation, it's a case of finally seeing the connection, the connection you have been intuitively working with all along. My pyramid baskets are a good example. Years ago, while playing with shapes, I stumbled onto a pyramid shape for a basket. Not being ready to continue with that form. I put it on the shelf for the future. When I was finally ready to make a series of these baskets, they just happened. There was no design source, no philosophic source. It was an attempt to create different shapes and embellish them. The "what if" questions were predominant in the design decision. But when the series was finished and I looked at the pieces all together, it was obvious that I was looking at a collection of step pyramids— "ruins". The step pyramids have always interested me (Photo 4). I've read a lot about them. When I'm in a slump, they're one of the image types I look at to encourage me to work again. They had not shown up in my work before. I don't think they would have been as successful as baskets or objects if I had been aware of the design source. I think they would have been contrived, awkward memories of specific pyramids. Instead, they work as individual pieces, baskets, and remind everyone of pyramids in general (Photos 5, 6 & 7).

Both types of inspiration rely on continuously saturating oneself with stimuli, then working a lot. Sometimes you can know what is exciting you and causing the work to flow and sometimes it's best just to let the work flow intuitively. Naturally which ever way you're working, a little of the other creeps in. That's why the saturation with stimuli, with imagery is so important. The saturation gives you a resource foundation, a well to pull from when you're out of ideas or hitting a stumbling block. Satura-

tion with your favorite imagery gives serendipity a chance to strike when you're "just playing around."

EPILOGUE

A Penobscot basket started me into basketry. It's the Akwesasne Mohawk basketry that I collect most frequently (it's quite similiar to the Penobscot basketry). Theirs was the first Iroquois basket outlet I found. They have been willing to sell me "curled" and very unique baskets. Through the years I've talked on the phone and written many letters to my liaisons with the tribe. I feel I know the basketmakers. This month (April), I finally get to meet them, my liaisons and the basketmakers. We will trade basketry workshops and share tips and tricks. I could say it feels like a dream come true, but it feels like more than that. I'm guite anxious to see what impact they'll have on my work. I know it will be significant. I feel like I will be touching my original source of inspiration.

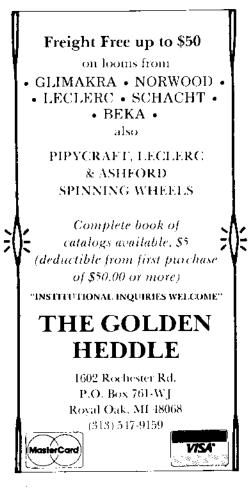


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THE ART OF IXCHEL: LEARNING TO WEAVE IN GUATEMALA AND RHODE ISLAND

by Margot Schevill

photos courtesy of author

It occurred to me when I was winding my wool into balls from the swift in Saunderstown, R.I. that this was the same process I had followed in the home of my teacher, a Maya Indian, in San Antonio Aguas Calientes, in the Highlands of Guatemala. Suddenly I felt as if I were back there. It was March, 1978, and I was pursuing field work for my Master of Arts degree from Brown University, Providence, R.I. Anthropology had attracted me as a discipline to study because I am a weaver, but wanted to learn more about the cultural context of the beautiful textiles I had seen in my travels in Mexico and the Southwest of the U.S.

Why had I chosen Guatemala for my field work? Because backstrap weaving has persisted for over two thousand years in the Maya Indian villages of the Highlands of Guatemala. It is an integral part of tradition or costumbre. It dates back to the Classic Maya Period, AD 300-900, possibly even earlier. In Maya legend the goddess Ixchel was said to have invented weaving. She was also known as the "Rainbow Lady," the goddess of medicine and childbirth. Her image was documented in various glyphs (Fig. 1) weaving with a backstrap loom and a weaving needle in her hand. Ceramic figurines from the island of Jaina, carved sculptures called stelae from Copan, (Photo 1) murals from Bonampak, stamps, seals, sherds and bas-reliefs of archaeological origin further document backstrap weaving and the intricate products of the loom.

Chronicles of Spanish conquerers and post-Conquest writings of travelers also have provided information about textiles from Mesoamerica. Hernando Cortes in his letters to Emperor Charles V noted the importance of textiles used as gifts; he received five or six thousand cotton weavings, richly dyed and embroidered in various ways. He commented on Montezuma's store house which contained male and female costumes, bedspreads and hangings resembling tapestries. Feathers and cotton of all colors were used.

Interest in developing collections of Guatemalan textiles began around 1890. During archaeological field expeditions at the turn of the century, the ground was laid for

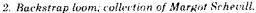


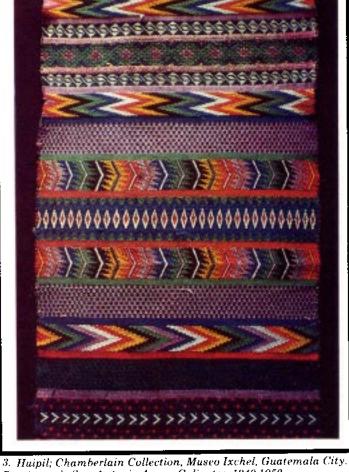
1. Stela H in Copan, Honduras.



FIGURE 1. Drawing of Jaina ceramic figure; classic Maya period.



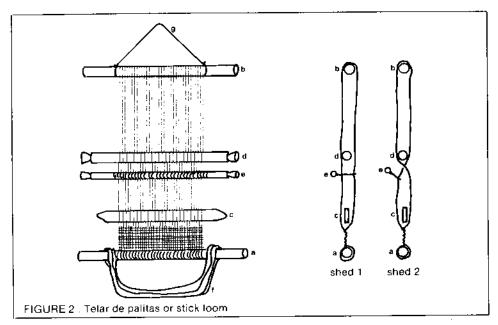




Provience de San Antonio Aguas Calientes, 1940-1950.

the collection of Indian textiles now housed at the Lowie Museum in Berkeley, for the collection at the Victoria and Albert Museum in London and for the collection of the American Museum of Natural History in New York. Today there are many private and museum collections all over the world, and exhibitions are taking place featuring Guatemalan costumes and related textiles. One of the recent and most outstanding exhibitions was organized by Ann Pollard Rowe, curator of textiles from the Western Hemisphere at The Textile Museum in Washington D.C., for the Center for Inter-American Relations in New York City. It traveled to The Textile Museum and the Boston Museum of Fine Arts. An excellent catalogue is available: A Century of Change in Guatemalan Textiles.*

Both backstrap and floor or treadle looms are currently in use in Guatemala. Before the Spanish Conquest, backstrap was the only loom in use, and elaborate textiles were produced on this simple apparatus. The loom is simple, requiring only two sticks (a-b) on which to attach the warp, a strap for the back, and some rope—hence the name in Spanish which means stick loomtelar de palitos. Additional sticks are needed to create sheds, as is a smooth piece of wood (c) carved like a sword and called the batten (Fig. 2, Photo 2).

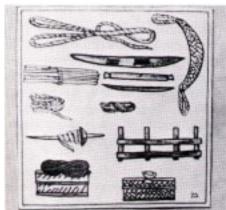


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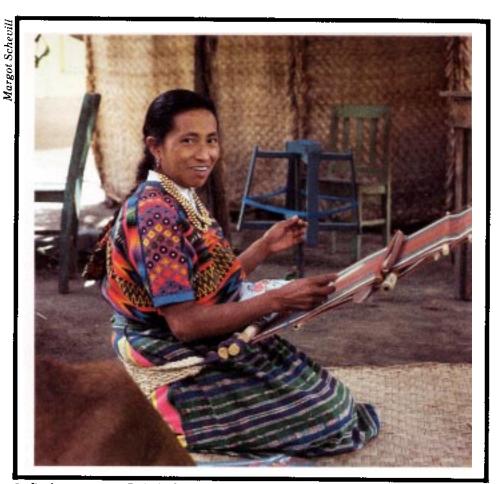
^{*}Rowe, Ann Pollard, A Century of Change in Guatemalan Textiles, 1981, Catalogue: Center for Inter-American Relations. Distributed by University of Washington Press, Seattle & London.

In order to weave, one end of the loom is attached to the rope (g) and tied to a post or tree. The other end is attached to the strap (f) that goes around the weaver's hips. Tension is created by the movement of the weaver's body, forward and backward, while kneeling on the ground or sitting on a low stool. There are two primary sheds. For the first shed, a batten is inserted in a space created by pushing the shed stick (d) forward. The batten is turned vertically to open the shed. Into the open shed the weaver inserts the weft, which is pushed in place with the batten. Sometimes a comb is used to secure the weft. The other shed, called La Madre, is more difficult to create and requires a different movement of the body. The weaver leans forward to release the tension on the warp, pulls up on the heddle bar (e), inserts the batten and proceeds. When the textile is completed, the continuous warp often creates finished selvedges on 4 sides. No thread is wasted. But sometimes when a weaver plans for several pieces in one warp, the textile is cut and the ends are hand-sewn.

Additional sheds are created with more sticks so that supplementary weft patterns can be woven, separated by rows of plain weave or tabby. The technique is called brocading or bordado and to the untrained eye the patterns appear to have been embroidered on top of the woven fabric with a needle instead of being an integral part of the textile (Photo 3).



4. Aztec weavers accessories at the time of contact; Florentine Codex, Mexico.



Backstrap weaver Rafaela Godinez of San Antonio Aguas Calientes in her home.

The weaving implements used by the Aztec weavers at the time of the Conquest are similar to what are used today by the Zoque Indians of Chiapas, Mexico, and Maya Indians of Guatemala. Similar implements for carding, spinning, plying, winding the yarn into balls and preparing the warp are also in use (Photo 4).

The advantages of the backstrap loom over the treadle loom are stated by Cherri Pancake*as such: "Complete control of the work can be achieved. By controlling with the body the tension of the warps rather than using the mechanical devices of the floor loom, changes in spaces and tension are easily manipulated; combinations of weaves within a single piece of weaving can be produced that would be difficult or impossible on a loom with a rigid warp." There is a size limitation both in width and length; backstrap weaving is also time consuming. So today one finds, in addition to treadle looms,

draw looms which were borrowed from the Chinese textile industry and were also introduced by the Spanish to produce yardage required for their ornate style of dress.

Backstrap weaving fits into the life of a traditional Indian woman since weaving is only one part of her daily routine (Photo 5). Household duties, child and animal care, gardening, and shopping occupy much time. For instance, tortillas are made fresh three times a day and washing is done by hand. Clothing for the family and utility cloths of all kinds are woven. Little samplers and large shawls are woven for sale and some women enjoy being a saleswoman or running a shop. Others may be contract weavers or produce for their neighbors who are too busy or don't like to weave.

*Pancake, Cherri. Textile Traditions of the Highland Maya: Some Aspects of Develop ment and Change. 1977. Paper presented at International Symposium on Maya Art, Architecture, Archaeology, and Hieroglyphic Writing. Guatemala City, Guatemala. The primary role of the traditional Indian man is to work in his fields, if he owns land. In his home he may assist his wife in the backstrap process by warping, plying and finishing. In Chichicastenango, men do intricate embroidery, not only on their own costumes, but also applique on women's blouses or huipiles. In Santa Maria de Jesus, the males of one family produce vardage on treadle looms commissioned by an American company while the women weave on the backstrap loom. I have seen Indian men on the bus taking weavings into Guatemala City for sale, either at the textile market or for shops with whom they do regular business.

H

In Saunderstown, R.I. I am struck by the contrast between weaving environments—San Antonio with its dusty ground, buildings made of wood and woven mats, tin roofs, courtyards behind high fences of corn stalks where we wove. Saunderstown—green, lush foliage, a huge silo and barn-like two level building, wood floors, sky lights, floor and table looms of all sizes and a fan going to circulate the warm air.

Because of tradition, weaving is taught by rote in Guatemala and on a one-to-one basis. (Photo 6) The family assumes the role of teacher; when my teacher was busy with household responsibilities, her son, daughter, mother or nieces supervised and guided me. I was never left alone.

The learning process is a source of conformity and hence contributes to the conservative attitude toward change which exists in traditional Indian societies in Mesoamerica. It is delivered through demonstration with some oral instructions. Children learn weaving as a form of play. The child first helps the mother to prepare the warp, and gradually assists in all aspects of the weaving process. By the age of ten, a child has usually woven one complete sampler.



6. Backstrap weaver teaching her daughter; Mendoza Codex.

There were eight other students in my class in R.I. and one teacher. We all were at different levels of weaving expertise. The studio was full of reading material about weaving: samplers on the walls, varns of all kinds around-a nononsense weaving environment. Our teacher spoke informally to each student, finding out what she wanted to weave. As I went through each step of the weaving process, I thought about the equivalent step in San Antonio, experiencing again some of the feelings I had four years ago.

Step I-What to Weave. The R.I. way was to choose whatever you wanted to weave related to your ability. I was interested in learning a new approach to warping the loom and in improving my basic weaving skills. Our teacher referred us to books, magazines, and the samplers around, as well as making suggestions about what kinds of yarns would be appropriate. Among Indians, a beginning backstrap weaver, as well as a child, has no options. A small loom or sampler is the first project; the patterns taught are those of the village and which appeared on the huipiles of my teaching family, not in books or magazines—a kind of wearable sampler. There were no choices as to the sett of the weave nor width.

Step II-Choosing Fibres and

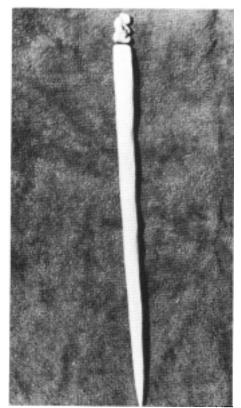
Colors. My R.I. teacher encouraged us to explore all the yarns around us, and guided us in making suitable choices. Cotton is the basic fiber used in traditional Maya Indian weaving: wool was introduced by the Spanish and silk became available when the Manila galleons used Guatemala as a stopover enroute to South America. Silk was always considered a luxury item. An excellent quality of cotton has been available from a factory in Cantel since 1876. It is tightly spun and aniline dyes are used. Although hand spinning and the use of natural dyes is still in existence in Guatemala, San Antonio weavers prefer to put their time into weaving itself. There are many colors available in both 2 and 3 ply that can be purchased in small shops in the village. Mercerized cotton called sedalina is used for special effect, but silk is no longer in use.

Steps III & IV—Preparing Balls of Yarn and Winding the Warp. These steps are similar in both countries. Guatemalan cotton comes in skeins so a swift is used. The warping board is placed horizontally on the floor or table and is a long, narrow piece of wood with two rows of pegs.

Step V-Warping. The contrast between the two approaches is really dramatic. Warping in R.I. takes so much time; many deci-

sions must be made concerning sett, length and width, placement and choice of patterns. Our teacher guided us, helping us to wind on. Threading was done in several steps so counting errors wouldn't be made. Tying-on involved additional care so the tension would be correct. On the other hand, it was at that point, on a hot dusty morning in San Antonio, that I really lost my self-confidence as a weaver. I didn't understand what was happening but followed my teacher's non-verbal directions while she smiled encouragingly at me. Somehow with the help of everyone, or so it seemed to me, the warp was transferred to the sticks and the loom was created, cross intact, and the equivalent of lease sticks tied in-so simple! As described above, one end was attached to a rope that was tied around a post that held up some grass mats that served as a roof for the weaving area. I had bought a jute backstrap the day before in the market and the other end of the loom was attached to it and around me. The length of the web was just short of a yard or vara, the measurement used there. The width was 13 inches. I was shown how to make cotton heddles which took some time. My body was beginning to complain, Fortunately my lesson was interrupted by lunch which I customarily shared with the family. Next I was shown how to define the two sheds. I had great difficulty getting the second shed, but I learned that all beginners had that problem. Daily life continued around me: children crying, chickens cackling, and the family chatting in Spanish and their Indian language, Cakchiquel.

Step VI—Weaving. Weaving American style involves finding the correct and comfortable seat position so that little strain is put on the lower back and arms. Our benches were adjustable and our teacher checked on each one of us to make sure we were comfortable. During the three-hour class, which included coffee breaks whenever we wanted, she would be sure to check



7. Bone weaving needle or aguja.

our progress, nipping problems in the bud, and making supporting comments. In Guatemala the correct position gave me special problems. Because my long legs were unused to kneeling tucked under me, I had to stretch out, sitting on a mat on the ground. This caused great amusement to the family. I used the backstrap around my waist to support me, not around the hips as my teacher did. Her son. however, sat on a small stool when he wove, above the females, with the backstrap around his waist, listening to soap operas on the radio. First I wove eight rows of tabby and then the loom was reversed and I started again, slowly gaining confidence, learning how to move backward and forward for alternating sheds. A tenter was used to maintain side selvedges.

Step VII—Creating the Pattern. On the floor loom, the pattern is pre-determined so weaving is rapid unless hand techniques are employed, such as two-sided patterning with a pick-up stick, which is what I chose to do for my second project. But on a backstrap loom, supplementary weft is used for the

pattern. An additional heddle rod was utilized to create a pattern called pepenado-all patterns have wonderful names such as foot-ofthe-dog, marimba, or scissors. For pepenado, an over-four under-two pattern was defined and nine rows were woven between more elaborate patterns, each one different from the one below. Pick-up technique or bordado is used for these designs and in San Antonio a bone needle called an aguja is employed. (Photo 7) Single-faced patterning is achieved by not carrying the supplementary weft along but making little butterflies for each design element within the pattern. A row of plain weave separates each pattern row. When the pattern is woven on both sides, it is called two-sided or marcador, Huipiles with marcador are the most desirable. Patterns vary from 1½ to 3 inches (38 to 76 mm) in length; I wove one pattern, 1½ inches, called marimba which utilized fourteen butterflies and took me fifteen weaving hours. It was only 13 inches (33 cm) wide.

Step VIII—Finishing. Floor-loomed textiles always require finishing of some kind, since 4-side selvedges are not possible. I spent more time wrapping and twining the fringe on my first project—a stole—than I did in weaving it. Backstrap loomed textiles can come off the sticks with four finished selvedges, if only one textile is desired.

Learning the process of backstrap weaving in the environment of Guatemala provided the background that I needed to write my thesis—The Persistence of Maya Indian Backstrap Weaving in San Antonio Aguas Calientes, Sacatepequez, Guatemala. In addition, I have my sampler of fourteen pattern bands, representing 108 hours of weaving. But it also inspired in me a deep respect for those weavers that I met during my three months there. The Maya Indians have persisted after the fall of their Classic Civilization to this day—a recorded history of almost two thousand years.



IN THE BEGINNING SKY SPANNED THE HEAVENS AND EARTH LAY FIRM BELOW.

AND IN ITS TIME AND IN ITS WAY CAME A UNION OF THE TWO:

FATHER SKY AND MOTHER EARTH.

AND FATHER SKY SENT DOWN TWO RAYS OF SUN TO WARM HIS BRIDE.

AND THEN,

LEST SHE BECOME DRY AND PARCHED HE FOLLOWED WITH A GENTLE RAIN

TO MOISTEN

TO GERMINATE

TO NURTURE

AND THROUGH THIS UNION THE LOOM TOOK FORM.

AS ITS TOP --- THE BOUNDLESS SKY

AS ITS BASE --- THE MASSIVE EARTH

BEAMING SUNRAYS -- THE UPRIGHTS

AND STREAMING RAIN - THE WARP

THEN SPANNING THE TOP TO KEEP WARP TIGHT

A LIGHTNING BOLT.

SO IT IS SAID.

NAVAJO LEGEND

FROM FATHER SKY TO MOTHER EARTH: AN ETHNIC INSPIRATION

by Noël Bennett

Navajo weaving flows from a rich heritage to speak in the voice of beauty. In a multi-faceted tongue it expresses Art as well as Craft; deriving power from depths of tradition, it extols a trueness to self. As I listen and hear, I am touched by the message and charged with a calling to accomplish the same trueness within my own work.

When an artist seeking inspiration looks to the art of another culture, the quest may be technique, design, or concept. Whatever the intent, enrichment is only the final step in the complex and intense seeking process:

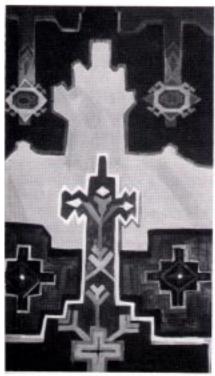
Awakening

Reaching out to something compelling
Studying it fully in its pure state
Making it a part of the self
Extracting areas that are personally meaningful
Releasing attachment to the studied form
Giving expression to the fuller self.



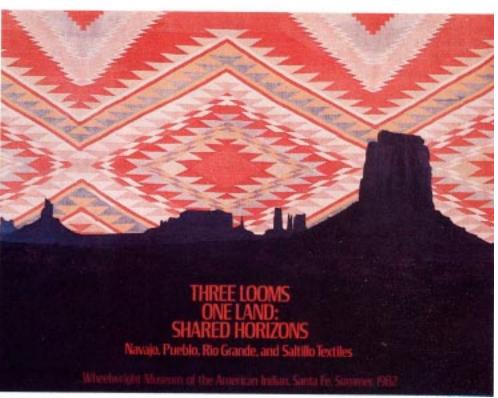
Noël Bennett in front of "In Memoriam" explaining how Navajo textiles have been a source of inspiration

In following such a complex path, there is the real danger of losing one's way, holding on to the way of the other culture, forsaking one's own. One needs a strong sense of self to submerge and then re-emerge fully integrated – and a strong artistic will to create from that experience a personal truth.



"Red Mesa" study

photo opposite: Navajo weaver. by Abigail Adler.



"Three Looms, One Land" designed by Noël Bennett and produced by Hundred Arrows Press, Austin, Texas. The 24" x 30" color poster is available with a \$25 tax-deductible donation to Shared Horizons, P.O. Box 1175, Corrales, New Mexico 87048.

My experience with "ethnic inspiration" began in 1968 when with advanced degrees from Stanford in fine art and philosophy, I moved to the Navajo reservation. I came as part of a family. I had one small son and was married at the time to a physician.

.

My prime focus was relating to the Navajo people whose days I was sharing, but whose language and heritage were completely foreign. To help bridge the culture I took up weaving. I determined to embrace the subject as purely and deeply as I could -- technically and philosophically. Relating cross-culturally required every internal resource I could muster. At the time I felt that I had been transformed back to the child - the toddler - stumbling, falling, hurting - in this way learning. None of the values I had once "known" to be true had any validity here. Every time my Angloprogrammed head interpreted a situation, it was wrong.

I had to become empty, release all I ever knew or believed, and fill again with only what was there before me. If I was to stay, I could not be the Angloobserver. I had to become participant, and focus on Being.

I stayed for eight years.

Life unfolds to many changes. We all change - our houses, our jobs, our skills, sometimes our marriages.

But there is a part of a person that doesn't change --

A certain uniqueness an essential essence

the very center

The "unchanging core."

When identifying the core of a person, one might ask:

"What quality gets you the farthest?"

"Is this also the same quality that gets you in the most trouble?"

"What characteristic makes you the most appealing to others?"

"Is this the same characteristic that makes you the most difficult to get along with?"

The unchanging core has many facets -- each a part of the whole.

A life situation, when distilled to its purest essence, also contains essential qualities that can be thought of as the core of that situation. This core reaches beyond the personal -- yielding insights and truths universal.

In my art, it is essential to me

to connect with the core,

to unite personal and universal --

to bring together for a single moment image, meaning, and being.

When my time on the reservation came to an end, various other facets of my life were changing as well. And inside me there welled the urge to create a weaving that would stand as a monument to the past:

to the Lebanese heritage to which I was born

to eight years with the Navajo

to a marriage and family that were dissolving. Each of these in their past pure form required acknowledgement, required release.

"In Memoriam" became the first in a monument series --

a monument to the past --

the individual as a member of a tightly structured whole.

The second in the monument series was "Red Mesa" -celebrating a land form to which I had always been drawn.

Symbolically the mesa is a fragment of land that through upheaval or pressure

is transformed into a non-erosive core.

It stands above the horizon, unmutedly true to itself, enduring blazing heat, torrential rains and sandblasting winds.

And most importantly, it does so with vibrancy and

"Red Mesa"; a monument to where I was at the moment --

the emerging individual.

Several years ago, wanting to give back to the culture that had gifted me so generously, I organized a nonprofit corporation "Shared Horizons" for the purpose of perpetuating the Navajo/Southwest Textile-Art Tradition. Biennially we coordinate national seminars bringing together world experts. The art-poster I designed for the past event, "Three Looms, One Land," is a continuum of the monument series:

Monument Valley landforms superimposed on a Navaio textile.

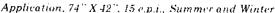
Here with Father Sky above and Mother Earth below is the rising/setting sun. Rainbow. Cloud. Lightning.

Here is the moment that Navajo legend records as the creation of the loom, the moment that universal elements join forces to participate in the creative process.

"Three Looms, One Land" is a monument to my essential energy -- a personal voice in a universal chorus, • 1983 Noël Bennett celebrating the core.

NOEL has been involved with Navajo weaving for more than 15 years beginning with her 8-year living and weaving experience on the Navajo reservation. She has authored 4 books on Navajo weaving techniques and philosophy and presented over 100 lectures and workshops nationwide.







Scal of Summer, 74" X 41", 15 e.p.i., Bergman

INSPIRATION by Philis Alvic

As a student of weaving I was very impressed by the fact that I could actually weave, and I was only interested in acquiring more and varied weaving skills. With the arrogance of most art students. I was sure that I had my own ideas and that all I needed was a vehicle for making them take form. After my initial burst of energy for skill acquisition, I began to discover the vastness of the visual textile tradition to which I had attached myself when I became a practitioner. In my experience, the beginning study of historical fabrics was a bit bewildering. What could I do that would be technically better than Peruvians?... conceptually grander than the Renaissance?...or more inventive with pattern than the early American settlers?

Shortly after leaving school I also left living in cities with their easy access to historic textiles, and I was forced to rely on books. Unfortunately, nothing beats being able to examine carefully an original work, because one is able to observe those factors which are most important to oneself. However, books, though a secondary source, do have the advantage of providing both distilled and supplementary information.

Bemoaning what one does or does not have access to can lead one to overlook the wealth of inspiration possible from what is available. In any one of my own pieces I am not influenced by all that I know about textile history, but only by one part of it. By focusing my attention, and by carefully exploring ideas, I have found that I come to a much finer understanding of the individual elements that go to make up my art.

I will now get down to the specifics of how a particular area of weaving history influences my work. When I was young, circumstances limited me to study textiles from books, and, twenty years ago, there was not the craft publishing explosion we enjoy today. But I did purchase both Black and Atwater, and they pointed me in a direction that I have continued to follow with the help of many other authors since that time. From the very first introduction, I have loved old coverlet patterns. Throughout my many years of weaving, I have continued to work with these patterns, and I still find them exciting and a continuing source of ideas.

I began by using these patterns exactly as the threading was given in the book. Occasionally, I still do this when it fits the concept of the piece. As an example, the top figure in "Application" has been changed very little from the pattern presented in Holroyd's "Designs of Jacob Angstadt," Through working with these patterns I came to an understanding of the principles governing the designs, and was able to invent my own. My patterns look very similar to the old ones because I have confined myself to working within traditional constraints.

The very busy, crowded nature of most coverlet designs bothered me, although I liked the individual figures. So, I selected out specific figures to work with independently; often positioning them in a plain ground. This focusing on the individual figure endowed it with a stature it did not have in the jumble of interrelated figures in the average coverlet. In "Seal of Summer" the snowballs and large medallion have been selected from different coverlets and placed in their own spaces. Presented in this way, the figures gain an importance they lacked in the original format.

In working with the coverlet patterns, I also do considerable adapting. Sometimes the adapting is simply to readjust size, but I also feel free to distort the symmetry or alter the relationships of the figures. My purpose is the prime motivating force, and I adapt to suit it, not limiting myself within the traditional usage. Any person at all acquainted with early American weaving can readily tell the influence it has had on my work. In using the old patterns, I feel that I have shown a respect for their original conception, but this respect has not been a confining factor.

When I first confronted the beauty of original historic coverlets, I wondered what of my own I could contribute to this tradition. Coverlets exerted their main influence on me in the area of pattern, but that left many other elements into which I could interject more of myself. Color and texture were the first elements that I altered. The limited palette of the old coverlets was due to the yarn dyes available at the time. I am sure that the weavers of old would have been delighted to use the array of color provided by modern technology. Some of our more adventurous ancestors would also probably have used a greater variety of textures if they had been available. As an artist, I think that I can take credit for the specific color and texture choices that I make, but I don't think that it is fair for me to fault my weaving predecessors for not using materials in a way that was not possible in their time.

My education in contemporary design ideas does play a role in the way I enlarge and elongate pattern figures. In looking again at "Seal of Summer" I have done both of these things. All of the figures are considerably larger than they would have been presented in any coverlet. The small snowball figures are elongated by using weft yarn much thicker than needed to square the figure. With the central brown figure, a group of weft picks was repeated more times than in the original to lengthen the figure. The bottom figures in "Application" were created out of the blocks of the top figure but simplified, enlarged and elongated. They are very similar while also being very different-producing a strong contrast between traditional and contemporary design concepts within the same piece.

Since I make hangings for the wall rather than coverlets. I often use a border to frame the figures. In "Application" I used a narrow patterned border, although I usually prefer a plain wider border. The border confines the figures while calling attention to them.

I have not mentioned weave structure in this discussion of how I have been inspired by early American coverlets. My primary influence has been from the patterns, but I have also learned much from the way weave structures were employed and manipulated. Structure and pattern remain two separate concepts in my mind and therefore I rarely weave a pattern in the structure of the original. In fact, I have almost totally rejected the most often used old structures. The common overshot I find too busy. with the incidental threads adding a confusing visual element. Also, I rarely have enough shafts to produce the designs in double weaveeven if I did like the visually sterile separate areas. I prefer Summer and Winter by far, because of its flexibility in block design manipulation and the rich surface texture.

I have selected, rearranged, adapted, enlarged and elongated the old coverlet patterns in a great variety of colors and textures, but I still feel that the way that these coverlets have influenced me is quite obvious. And, there are still alot of ideas to be gleaned from careful observation and study in the area of weaving that I have chosen to seek my inspiration.

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ABOUT THE AUTHOR: Philis Alvic is best known for the multi-shaft, brightly colored wall hangings which she exhibits throughout the country. She holds the Certificate of Excellence of the Handweavers Guild of America, and regularly conducts workshops for weavers' guilds. Philis Alvic's recent work has combined a deep interest in exploring variations in weave structures, with a continuing desire to utilize traditional patterns in a contemporary manner. Ms. Alvic's work has always been extensively involved with the use of the loom as a creative tool, and she has published many articles on these topics in national weavers journals. Philis Alvic is currently writing a column for Shuttle Spindle and Dyepot entitled 'Notes of A Pattern Weaver.

A SPECIAL PIECE — A SPECIAL PLACE by Nancy Harvey

To me one of the nicest things about weaving is the friends we make, the sharing of ideas, the learning and growing. A special piece for a special place involved all of these.

A short time ago I was contacted by an artist in the community who wanted to work together with a weaver on a special project for this year's liturgical art show. Henriette Doglietto came to me to see if I would be interested in weaving a tapestry banner of her design.

She explained to me that the Cathedral of The Blessed Sacrament is the center of the Catholic Church in this diocese and that the City of Sacramento was named after the Sacrament. Therefore, the theme of the Blessed Sacrament was her inspiration for design.

She had selected elements which are known symbols in Christian art:

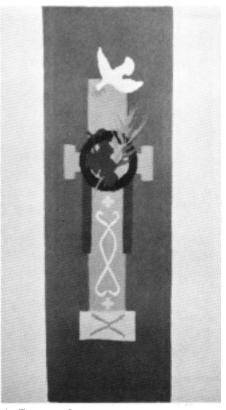
The circle as a symbol of eternity and never-ending existence. As a monogram of God it represents not only the perfection of God but the everlasting God.

The dove as a symbol of purity and peace. The most important use of the dove in Christian art, however, is as the symbol of the Holy Spirit.

Bunches of grapes and stalks of wheat were used to symbolize the Eucharist.

The Cross is a symbol of service. It is the mark or sign of Christian religion.

The arrangement of forms and the unusual use of colors are contem-



1. Tapestry Banner; Doglietto and Harvey

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Right Fiber, Wrong Color?

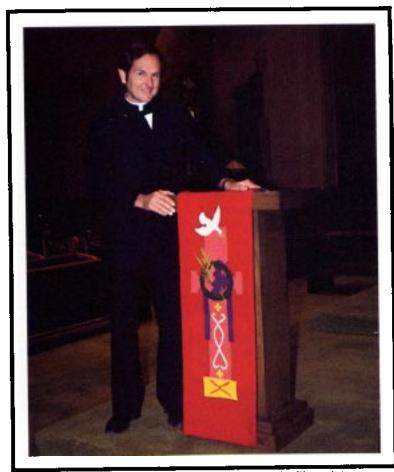
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2. Monsignor Kidder with tapestry banner at Cathedral of the Blessed Sacrament

the spirit of new times into the church. Color also played a symbolic role.

Green is the symbol of eternal life. Through the cross it becomes the color of spring after winter, or of life after death, thus of faith.

Red identifies with love as the compassionate color of Christ, and is also used to commemorate the coming of the Holy Spirit. The value of the red chosen was to identify with compassion, not passion.

Purple is the color associated with royalty, the sign of imperial power and authority. As such it is used as a symbol of God.

Henriette Doglietto is a painter who teaches art as well as art appreciation at St. Francis High School in Scaramento. In addition, she has been actively involved in liturgical art for the diocese for the past ten years, working with artists so their ideas and skills could be brought into the church. She has coordinated an invitational reli-

gious art exhibit during the annual Congress of Liturgy, sponsored by the Liturgical Commission of the Diocese of Sacramento, CA., and it was at this art exhibit, several years ago, where we first became acquainted.

She was not familiar with the steps involved in tapestry weaving, and had never designed a piece which was to be woven; and since I was not well versed in the role of art in the church, and had never woven a tapestry designed by anyone other then myself, we spent many hours educating one another before beginning the project.

While discussing the preliminary design, I explained that it would be best to weave the piece in a side to side direction, rather than from bottom to top. This would make the vertical curved design lines horizontal during weaving so as to make them smoother and more graceful. Along with this, decisions had to be made regarding the proper warp setting and the type of weft material needed. As the piece

was to be a podium banner which would be moved frequently from podium to wall, it would be best to have a sturdy durable weave. I suggested we use a cotton warp with 6 warp ends per inch (25/10) cm) and a medium weight wool weft. (I used Borgs Notharsgarn. 1200 m/kg, or about 600 yds/lb, for the weft). I also recommended that no single design element be less than 2 warpthreads wide (1/3rd of an inch or 8.5 mm). As we chose the yarn colors, we selected shades of the various colors to complement the environment where the banner would hang.

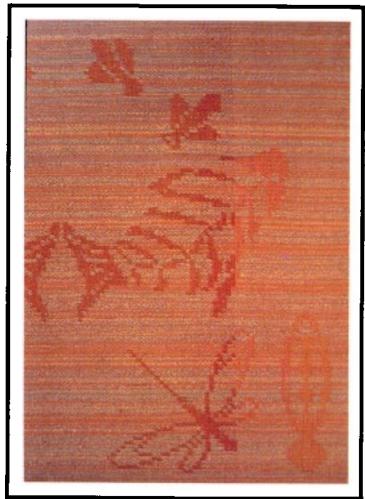
Henriette was beginning to understand the limitations of tapestry weaving and quickly recognized that some shapes would have to be redesigned or slightly repositioned. As she reworked her design, she had to keep the limitations of tapestry weaving in mind and still retain the original truth and honesty of the piece.

While the cartoon was being redesigned, I warped the loom and ordered the weft materials. When she returned with the design, it was ready to be woven. With Henriette at my side, I began to weave and explained the process and techniques used and compared them with those used in the past... in a different place... at another time.

During the entire collaboration, designing and weaving, we kept in mind that the role of Christian art was to educate and elevate. This has been the continuing principal purpose of Christian art up to the current time.

After the art show we presented the tapestry banner as a gift to the Cathedral of The Blessed Sacrament. We hoped, through our joint efforts of combining our individual specialities, of sharing knowledge, of bringing techniques from the past and presenting time in a contemporary manner, that we too had played a small part in this role . . . to educate and elevate.

ABOUT THE AUTHOR: Nancy Harvey is a tapestry designer/weaver, tracher and author from Citrus Heights CA.



Damask is a fairly old type of textile structure; some of the earliest really good examples are found in Near Eastern or Chinese textiles which were exported to Europe via

tions of these fibers.



1. Damask napkin, late 18th century German; courtesy of Old Sturbridge Village, Massachusetts,

2. "Mesa Country", detail

A CONTEMPORARY USE OF DAMASK by Constance La Lena



the established trade routes of the Middle Ages. Later, European-produced damasks were woven in linen, silk, wool, and in combina
3. "Mesa Country", detail, silk and wool hand dyed damask, by Constance La Lena; owner,

Mesa United Bank, Grand Junction, Colorado.

In its most classic sense, damask describes a reversible figured textile, the figures being formed by two faces of the same weave. Classic damask depends only on fabric structure to describe the figures in the textile: all the yarn used is the same color. Because of the great difference in appearance between the two faces, a satin structure is often used for damask, but twill damask may also be found. A satin damask will show the figures in warp-faced satin and weft-faced satin (sateen); the reverse being the case on the other side of the fabric. A twill damask can be either a straight twill, a broken twill, or a broken reverse twill; the weave used will, like satin, be designed so that the figures of the design will show in warp-faced and weft-faced twill.

In its general sense, damask also refers to weaves which utilize two different binding systems to form the pattern, and by extension to all sorts of richly patterned textiles (but not tapestries or brocades) which were of Oriental or Near Eastern origin but later were produced in the European countries and in the United States. Familiar forms of damask are the largepatterned silks and wools used in furnishings fabrics in the 18th century, and patterned linens and cottons used especially for tablecloths and napkins in the 19th century. One particular characteristic of these types of early damasks is the repeat pattern occurring across the width of the fabric, size of which is a function of the number of pattern shafts on the drawloom and the fineness of warp sett. An excellent example of repeated patterns can be seen in the accompanying illustration of the German napkin woven in blue and white linen damask (Photo 1).

I became interested in damask several years ago when I discovered the complex patterning capabilities of compound shaft arrangements in looms and bought a drawloom. I came to weaving from painting and drawing, and the

inspiration for that aspect of my work has continued to be the desert landscape of eastern Utah and western Colorado where I live. I had woven a series of large landscape-inspired wallpieces in a brocade technique, but was frustrated by the tedium of laying in the individual yarns and the imprecision of the "manual" definition of forms in the hand method I was using. At that time, I had in mind to weave wallpieces in editions —like fine prints—and needed a certain measure of speed in the process. The process I was using just didn't seem to fit my artistic ideas, but I was at a loss as to how to obtain the finely detailed pictoral qualities I wanted in my work without resorting to slow working methods like tapestry.

At Convergence in 1978, I saw my first drawloom, and bought one a week later. I was immediately struck by the almost endless possibilities inherent in the tool, and it seemed the answer to my needs. It is interesting that my path was parallel to the weavers of an earlier day, and for essentially the same reasons, In Northern Europe, weaving was first practiced as a domestic art, and was done by women using warp weighted looms. Around the 11th century the treadle loom was introduced, and weaving became a craft practiced by men who were organized into workshops and guilds for the production of fabrics. The principle of mechanical pattering, meanwhile, had been wellestablished in the Near Eastern silk manufacturies as early as 300 A.D., and it can be supposed that this area was also the center of development of mechanical patterning looms. However, it was nearly 1000 years before similarlypatterned textiles were woven in Europe; first in Italy, then later in France and England. Little is known of these early looms, but by the mid-fifteenth century, a loom that we would now describe as a drawloom was in use in Italy and France. The unique feature of a drawdown is that it separates the patterning function of the loom from the fabric-weaving function and allows the weaver (or weaver and "drawboy") to control one independently of the other. The flexibility of this system and the endless possibilities it can provide ensured that the loom was adopted and improved on wherever mechanical patterning was desired; one well-known result was the development of the Jacquard loom in 1804.

The damask structure I am currently exploring in my work is a traditional 6-end damask, chosen because it enables me to work with an even number of treadles and the structure allows sharp breaks between blocks in both the warp-wise and weft-wise directions (Photos 2 & 3). The traditional idea of pattern formed by the interplay of warpfaced and weft-faced structures is preserved, but I have added the additional dimensions of color and texture in places where the concept of the piece calls for it. The silk warps of my pieces are sett so that the pattern blocks are about 1/10" (2.5 mm) each in size, and a full pattern repeat in the warp is about 8" (20 cm). As my work evolves further, I expect that the warps will become finer and finer (thus the blocks and repeats will be smaller) in my search for greater refinement. Finished pieces, however, tend to be quite large: one just woven (but not yet finished or mounted) as this article is being written measures 7" x 10" (2.14 x 3.05 m).

Constance La Lena is a well-known professional weaver and dyer. For workshop information write to Sunflower Studio, 2851 Road B\%, Grand Junction, Colorado 81503.

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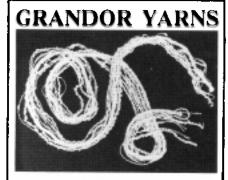
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FOUR-BLOCK DOUBLE WEAVE ON FOUR SHAFTS

by Clotilde Barrett



1. Table runner designed and woven by Elizabeth Kolling-Summers.

It's impossible! O.K. This first reaction is quite understandable. After all, haven't we all learned that it takes 4 shafts to weave a block of double weave, 8 shafts to weave two blocks, 12 shafts to weave three blocks, etc. This must be a trick! Is it one of these weaves where the loom has to be equipped with shaftswitching devices, long-eyed heddles or something we haven't heard about yet? No, this weave is woven on a regular four-shaft table loom or floor loom with 8 treadles. If the 8 treadles are not available, the fabric must be woven by using two treadles at the same time (with two feet). So, what's the catch? The answer is simple: it is true that structurally one can only weave one double weave block on 4 shafts, that is, two layers of plain weave cloth that can cross each other along horizontal lines, thus making long horizontal pockets or tubes (Fig. 1). On the other hand when we weave we do not work only with fabric structure but also with color. It is through the use of color, a pattern color (dk) and a ground color (lt), that one can create 4-block patterns on 4-shaft double weave.

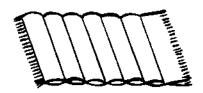


FIGURE 1. Horizontal pockets

STRUCTURE

4-block double weave has the structure of two layers of plain weave woven simultaneously. The two layers are stitched together weftwise after each treadling block.

BLOCK PATTERN

Fig. 2 shows a 4-block pattern and the corresponding profile threading.

1. The pattern blocks will be woven as solid color blocks, solid dk on the face, solid lt on the back. The block opposite of the pattern block (C is opposite of A) will be woven on the face with a lt warp and dk weft. The reverse on the back. The two other blocks will be woven with a mixed warp (1 lt, 1 dk) and a dk weft on the face, a lt weft on the back.

- 2. The pattern blocks may not be combined. For instance, blocks A and B cannot be woven solid dk on the face at the same time.
- 3. There is no limit to the size of any block.

WARP AND WEFT

For a balanced weave, the warp and weft should be the same yarn. There is a dk-lt color alternation in both warp and weft. The warp should be sett twice as close as for plain weave.

THREADING UNITS

Fig. 3 shows the threading units; the dk warp ends have been boxed.

The dk ends of the units are the same as for overshot threading. Here, however, each one of these dk ends is followed with a lt end on a partner shaft.

The partner of 1 is 3 The partner of 2 is 4 The partner of 3 is 1The partner of 4 is 2

Do not repeat the same pair of partners when passing from one block to another (Fig. 4).

THREADING

The easiest way to thread this weave is to start with the regular overshot threading which corresponds to the threading profile of the pattern chosen.

This will be the threading for every other warp end, e.g., the dk ends. Follow each of these ends with a lt end threaded on the partner shaft. See Fig. 6.

TIE-UP AND TREADLING

Fig. 7 shows the tie-up and treadling for an 8-treadle loom and practical tie-ups when less treadles are available.

Start weaving with dk weft and alternate dk and lt throughout.

REVERSING THE COLOR ORDER OF THE WEFT

By reversing the color order of the weft in Fig. 7, the lt weft will weave the top layer and there will be lt solid blocks instead of dk solid blocks. The treadling unit referred to as block A will show solid lt in block C, the treadling unit referred to as block B will show solid lt in block D, the treadling unit referred to as block C will show solid lt in block A and the treadling unit referred to as block D will show solid lt in block B.

PROJECTS

The projects are woven with 22/2 cotton-linen blend. The yarns are Borgs cottolin and the color numbers will refer to that brand of yarn. For more information on Borgs cottolin, refer to "Product Reviews, p. 84.

TABLE RUNNER

Warp: 22/2 cottolin in two colors; unbleached and gold (#226).

Weft: Same as warp.

Yarn requirements: Two 250 g tubes of each color.

Sett: 30 epi (120/10 cm)

Width in the reed: 32" (80.7 cm).

Total number of ends: 968.

Length of the warp: 3 yards (2.74 m).

Measurements: 30" x 64.5" (76.2 cm x 163.8 cm). After washing: 28" x 56.5 (71.1 cm x 143.5 cm).

Pattern: See Fig. 2.

The project has areas where the dk weft weaves the top layer and areas



2. Rainbow blanket designed and woven by Elizabeth Kolling-Summers.

where the lt weft weaves the top layer. See Fig. 8.

Threading: See Fig. 9.

Tie-up and Treadling: See Figs. 7 and 8.

For each block, repeat the treadling sequence until the block is squared out.

Weaving: Use two shuttles, one with lt weft, one with dark. Interlock the lt and dk weft at the selvedges to join the two layers of cloth

Finishing: With sewing machine, zig zag stitch along each warp edge using matching thread. Turn under each hem ½" (1.27 cm) and slipstitch by hand.

RAINBOW BLANKET

The 4-block double weave technique is used here to weave a blanket with solid primary and secondary color blocks and an amazing number of color blends. A perfect color gamp!

Warp: 22/2 cottolin in the following colors: blue (#239), red (#317), yellow (#238), violet (#285), orange (#326), green (#313), pale yellow (#272), pale blue (#278).

Weft: Same as warp.

Sett: 32 epi (125/10 cm)

Width in the reed: 32" (81.9 cm).

Total number of ends: 1024.

Length of warp: 2½ yards (2.3 m).

Measurements: 30" x 49" (76.2 x 124.5 cm). After washing: 28% x 43%" (73 x 111.1 cm).

Pattern: All the blocks are the same size (see Fig. 10).

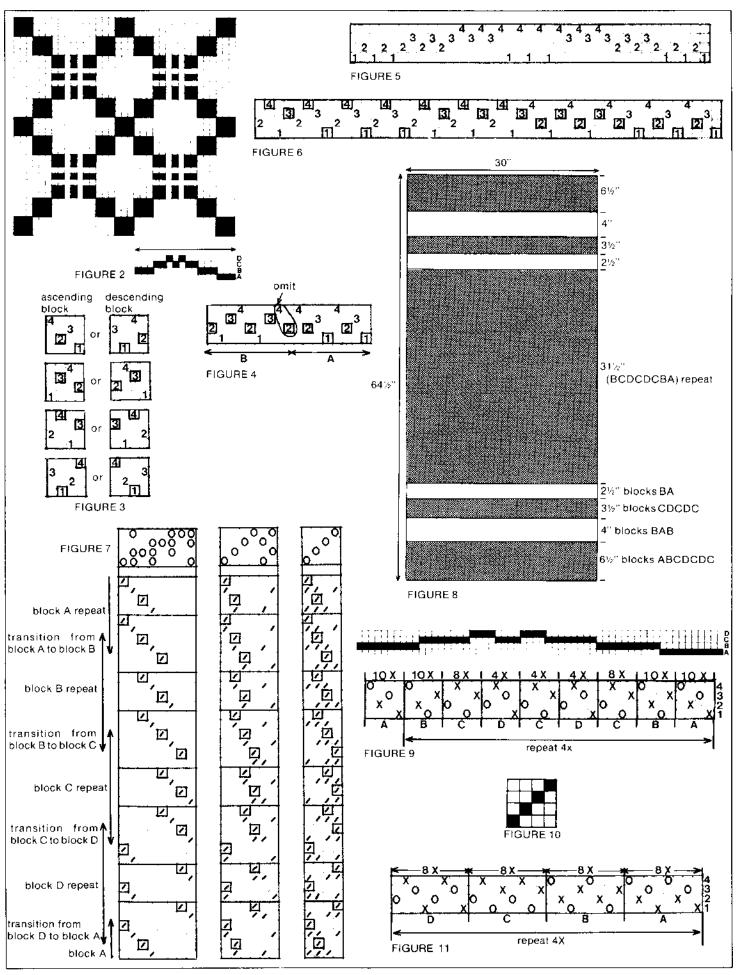
Threading: See Fig. 11.

Tie-up and treadling: See Fig. 7. Weave block A with blue and violet. Weave block B with yellow and green.

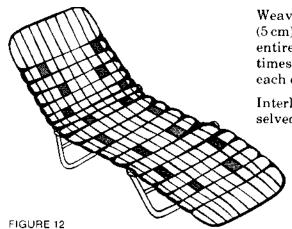
Weave block C with red and orange. Weave block D with pale yellow and pale blue.

Weave block C with violet and blue. Weave block D with green and yellow.

Weave block A with orange and red. Weave block B with pale blue and pale yellow.



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Weave each treadling block for 2" (5 cm) in the order given. Repeat the entire treadling sequence three times. Weave ½" (1.27 cm) extra at each end for the hem.

Interlock the two wefts at the selvedges.

Finishing: Zig zag raw edges with sewing machine using matching thread. Turn under ½" (1.27 cm) hem and slip stitch by hand.

PADDING

Four-block 4-shaft double woven fabric may be padded.

The padding takes place after a treadling block is completed. Lift the warp threads of the top layer and stuff the pocket that has just been woven. See Fig. 12.

HOW ONE WEAVE LEADS TO ANOTHER by Clotilde Barrett

The 4-block 4-shaft weave discussed on p. 72 of this issue wasn't just copied out of a weaving textbook, although there is no doubt that the weave has been discovered by someone before this. The way I developed this weave from classic overshot is rather interesting and involves several theories of fabric structure and design. The different steps of the discovery of a 4-block 4-shaft weave will be outlined here.

1. OVERSHOT. Photo 1

Fig. 1 shows a simple overshot, a twill tie-up and the treadling for the pattern weft for a weave in which the blocks are woven as drawn in. It is implied that the pattern picks alternate with tabby picks that act as binders and weave

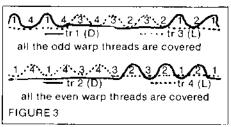
a plain weave ground.

For the sake of simplicity we have chosen the most elementary overshot threading but our theory applies to any four-shaft overshot.

2. COMPLEMENTARY WEFT PLAIN WEAVE ON OVER-SHOT THREADING. Photo 2

Fig. 2 shows an overshot threading with a twill tie-up. Here there is no true tabby which weaves a ground but there are two wefts of equal grist: D and L. One weaves the pattern (D), the other the ground (L). At any time a D pick and an L pick complement each other to weave what appears to be one tabby pick on the face of the

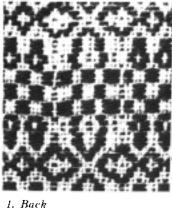
cloth. (See Fig. 3). There are long floats on the back of the cloth.

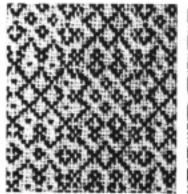


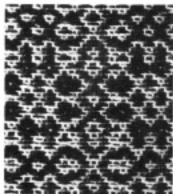
To weave an overshot treading in complementary weft plain weave the treadling sequence of the D weft is as the warp threads are drawn in but each D pick is followed by a L pick thrown in the partner shed (or treadle).

The partner treadle of 1 is 3 The partner treadle of 2 is 4 The partner treadle of 3 is 1 The partner treadle of 4 is 2





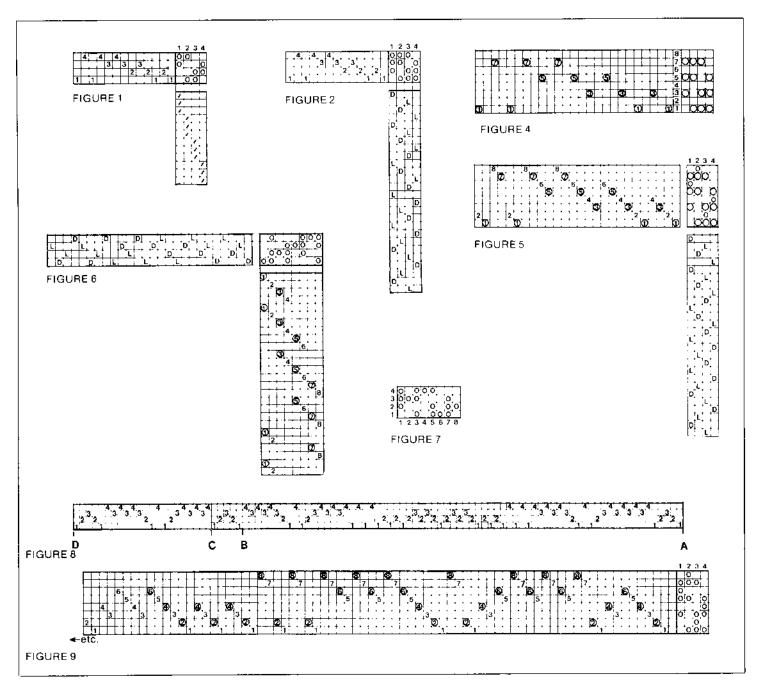




2. Front

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2. Back



3. 8-SHAFT DOUBLE WEAVE. Photo 4

The long floats on the back of complementary weft plain weave cloth, woven on overshot threading, may be avoided through the use of a second warp. The first warp is usually the pattern warp (D) while the second warp is the ground warp (L).

For the top layer of this double weave structure to look identical to the face of the complementary weft plain weave (#2), the top (first) warp should be the ground warp (L) while the second warp (bottom) should be D.This pattern is less attractive and is on the reverse side of the cloth.

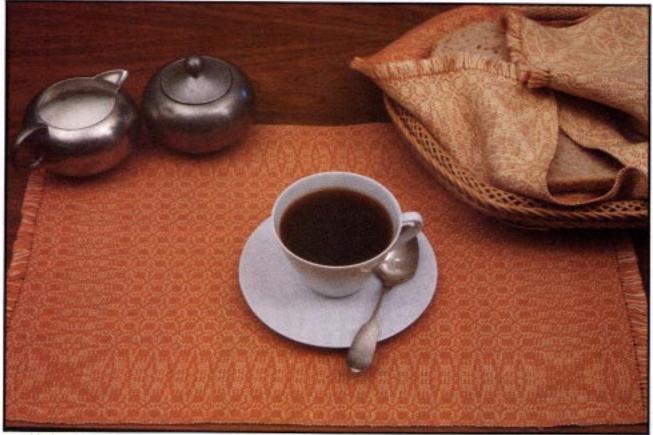
The second warp interweaves with the weft floats (on the backside) and makes a second layer of plain weave cloth. The fabric is double cloth (2 layers of plain weave) with 4-block overshot designs. The warp alternates an end of D (circled numbers) and an end of L in a 1/1 order.

The D warp is threaded on the odd numbered shafts as shown in Fig. 4. Each D warp is followed by an L warp on a partner shaft.

The partner of shaft 1 is shaft 2 The partner of shaft 3 is shaft 4 The partner of shaft 5 is shaft 6 The partner of shaft 7 is shaft 8 See Fig. 5. The odd numbered shafts are tied as in Fig. 4. The even numbered shaft are tied for a $\frac{1}{3}$ twill, e.g., lift 6, then 8, then 2, then 4. The treadling is the same as in Fig. 2.

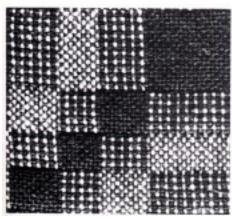
4. TURNING AN 8-SHAFT 4-TREADLE WEAVE INTO A 4-SHAFT 8-TREADLE WEAVE. Photo 3

Any weave, including the one of Fig. 5 can be turned. Turning a weave means to weave a cloth with the same appearance and structure as the original fabric in what was the warp in the original fabric is now weft, what was weft is now



4. 4-block 8-shaft double weave placemat

warp, what was the treadling is now the threading, and what was the threading is now the treadling. Thus an 8-shaft 4-treadle weave becomes a 4-shaft 8-treadle weave. Fig. 6 is Fig. 5 "turned". The treadling of Fig. 5, which reads from top to bottom, is recopied as threading for Fig. 6 and is read from right to left. The threading of Fig. 5 is recopied as treadling for Fig. 6. Fig. 7 is the turned tie-up. However, it is not enough to just "turn" the tie-up; the correct tie-up as shown in Fig. 6 is the "opposite" tie-up of Fig. 7.



3. 4-shaft 8-treadle weave

PROJECT-8-SHAFT, 4-BLOCK DOUBLE WOVEN PLACEMATS

The article on p. 72 describes two projects woven in the 4-block 4-shaft weave. The placemats shown in Photo 4 are an example of 4-block 8-shaft double weave.

Warp: 10/2 perle cotton in two colors D and L (USDAN KOLMES CO. #272 (melon) and #271 (champagne)).

Weft: Same as warp.

Yarn requirements: 2 1½-lb cones, of each color for 12 yards of warp.

Sett: 40 epi (160/10 cm) in a 10 dent (40/10 cm) reed.

Color order of the warp: (D, L) repeat.

Width in the reed: 13.65" (34.1 cm)

Pattern: "Kay's" design from Marguerite Davison's A Handweaver's Pattern Book p. 144. See Fig. 8. Thread AC; (CD) 6 times; BA.

There are 273 threads in the pat-

tern. This pattern will be threaded with I) on shafts 1, 3, 5 and 7. See Fig. 4. The same pattern will also be threaded with L on shafts 2, 4, 6 and 8. See Fig. 9. There are 273 D threads and 272 L threads.

Use a double D thread on each side as a floating selvedge.

Measurements on the loom: 13.65" or 34.67 cm (in reed) x 19½" or 49.5 cm (under tension).

Finished size: 13" x 18½" (33 x 47 cm).

Finishing: Hemstitching on the loom.

Treadling: Alternate a D pick and a light pick. With D, treadle as the warp is drawn in in Fig. 8 but repeat section CD as often as necessary for the proper length of the mat. Finish with BA. With L treadle the partner sheds. Thus, follow treadle 1 (D) by treadle 3 (L), follow treadle 2 (D) by treadle 4 (L), follow treadle 3 (D) by treadle 1 (L), follow treadle 4 (D) by treadle 2 (L).

Wash mats in hot water and press.



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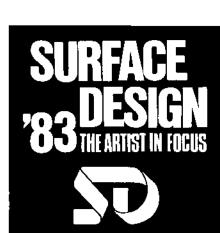
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LEARNING TO WEAVE IN JAPAN by LaVonne Schreiber

How does one learn to weave in Japan? I have asked the question many times during the ten years I've been researching Japanese weaving.

A decade ago there were three major ways, all of them requiring a long-term commitment: (1) apprenticeship, (2) technical trade schools, and (3) art colleges and universities. Recently two additional systems have become prominent: weaving schools and small classes conducted by private individuals.

Before discussing these learning situations in more depth, another question comes to mind while investigating Japanese weaving: What is the relationship between history, tradition, culture and the weavings that is taught today?

HISTORICAL ROOTS

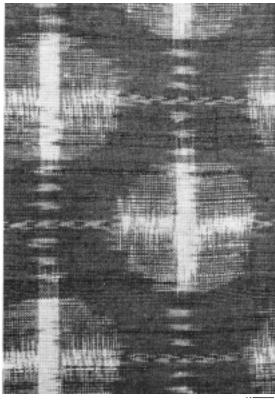
The roots of Japanese weaving are in China and the introduction from there of the draw loom made brocades and other highly decorative fabrics available to members of the ruling classes as early as the Nara Period (646-794). Sericulture was also imported from China; no one can dispute the elegance of silk when used as a garment fabric. However, silk has always been expensive, so common people developed weaving techniques using such varied natural materials as banana fiber in Okinawa, wisteria vines in central Honshu and tree fiber in Hokkaido, Looms for weaving the fabrics were backstrap looms at first, later the *iizaribata*, or rigid frame backstrap loom, was developed. The more advanced floor looms with multiple shafts were imported at first from Korea and China, but Japanese weavers modified the design.

The combination of loom capabilities and material availability greatly influenced traditional designs. The Japanese people's love of intricate patterns derived from nature could be satisfied through the use of the draw loom, and skill in its use became most highly developed in the Nishijin section of Kyoto. The common people, however, were forbidden to use bright colors and lively patterns; therefore, less ornate designs and quieter colors were used for folkwear.

Stripes are a simple way to achieve design changes, even on a backstrap loom, so stripes and plaids (often called lattices) became popular. Men's garments today still use fine stripes, especially for the formal hakama, which is a pleated skirt used as an overgarment. Since kimonos require fabric 12 meters (13.1 yards) long and 37 cm (14.6") wide, matching weft stripes is extremely difficult; that may be the reason they were seldom used. The old kimonos usually show no attempt at matching plaid at the seams.

Another major system for varying design in a tabby woven fabric was that of kasuri (ikat). Trading ships first brought pieces of ikat from Southeast Asia to Okinawa and the techniques became so highly developed there that fabries using them were in great demand as annual tax payments. The use of kasuri spread to several other regions as a result of the trade routes and kasuri was used in the weaving of cotton, bast fibers and silk. However, the methods used to produce the resist varied from region to region.

With the use of the 4-shaft loom, copied from those in Korea and China, overshot patterns became a



3. Kasuri fabric, silk; student work at Kawashima textile school

third design element, but these were not as common in the Edo Period (1615-1867) as fabrics with stripes, plaids, or *kasuri* decoration.

One other universal element is found in traditional Japanese fabrics—vegetable dyes—and even today they are often found in top quality silk, cotton and other plantfiber kimonos.

TRAINING OF WEAVERS

Apprenticeship. History and cultural tradition greatly influenced the training of weavers in Japan. Prior to the opening of Japan to foreign trade in 1868, craft workers learned through the apprenticeship system, beginning by doing menial tasks in the shop of the master craftsman and learning by watching the production of the object. Only the masters created new designs; independently developed designs by apprentices were not permitted. Therefore, it became tradition to copy the master.

Often poor families sold their young daughters to weaving shop owners where they learned weaving skills not by choice but through the necessity for survival. As sim-



1. Linen bags, Akie Kaneuchi student exhibit, Tokyo

ple skills developed, more difficult tasks were taught until the apprentice became proficient enough to receive pay for the work accomplished.

Now, of course, young girls are no longer sold to weaving shops, but some young people do choose to learn weaving (or other crafts) through the apprenticeship system. Master craft artisans still maintain that this is the best way to learn.

In some shops the apprentices may come from the immediate locality, while others have finished a university degree and work out an agreement with a master for a learning/producing situation. Usually it is for a three-year period, with the apprentice paying a small amount (or nothing) for instruction, but producing fabrics which become the property of the shop owner. Gradually, more competence develops and the weaver receives a small amount of money for his/her labor.

After completing this training, she/he may choose to return home and weave independently, or may continue to work for that weaving shop, either using its facilities or working at home. When weaving at home, the weaver usually buys a loom but the yarns are furnished by the shop. Upon completion of the weaving, it is inspected, usually at the weaving association's office, and a cash payment made to the weaver.

Another system is used by a master weaver in Tokyo. His shop usually has five young apprentices who agree to work for one year. They learn all of the processes involved in producing handspun, handwoven wool fabrics which are sold at that shop's semi-annual exhibition. The master is not concerned with speed, but with quality, and is constantly helping the apprentices learn high technique. In fact, his shop's products are well-known to be "ichiban" (the best). Occasionally an apprentice will spend two vears in order to learn more from this master.

Technical schools. During the Meiji Era (1868-1911) trade schools began to be established for training crafts-persons to produce industrial products. The use of the Jacquard loom greatly simplified the weaving of the intricate designs which formerly required the use of the draw loom, and technicians and designers were needed to work in the textile mills. However, handweaving was not dropped from the scene as quickly as it was in western countries, so training in handweaving techniques became a part of the curriculum. While the majority of kimono fabrics are now power loomed, there is still a demand for handwoven kimono fabrics and many of these are produced on a commercial basis, with the weaving association bringing a warped beam to the weaver, who then weaves the fabric at home.



2. Tsuzure silk tapestry, Kawashima Textile School student at work

Currently, there are technical textile schools in major textile areas and they teach students handweaving skills in addition to offering classes in power loom weaving, designing, dyeing, et cetera. One which I visited taught students to weave such diverse fabrics as handspun wool mufflers, silk kimono fabrics, synthetic skirt fabrics, and silk obis (the wide belt that is always worn with a kimono) using a tapestry technique. Upon completion of this education, the graduate works either at home or in a commercial shop.

Higher education. Weaving departments were established at the university and college level after the country began to recover from World War II. National art universities are located in many prefectures and some of these offer weaving instruction. Admissions are highly competitive and only a few students can expect to learn to weave by training at these institutions. They are trained as artists first, craftspersons second, and graduates seldom work in the routine production of kimono fabrics unless they establish independent studios and weave them on a one-

80

of-a-kind basis. They also often produce fabrics for interiors and exhibitions. Some graduates find jobs teaching weaving in small two-year colleges. Most of the instructors at these universities have strong exhibition records and are well-known.

It is extremely difficult for foreign students to be admitted to a national university unless they receive a Ministry of Education Scholarship. Under that program the study of the Japanese language is mandatory because all instruction is in Japanese.

Some private colleges and universities also have weaving departments and these are often a part of textile design departments which offer specialization in surface design on fabrics (screen printing and the use of paste resist—katazome) as well. A few private higher education institutions will accept foreign students, but most require some competence in the Japanese language and a plan for pursuing a degree. Tuition is generally about \$10,000 for a four-year period, with the school year running from April to the beginning of March.

Private textile schools. Since Japan has no system of continuing education programs sponsored by higher education institutions, a gap existed for people who wished to learn to weave, but could not make the long-term commitment necessary for the instruction discussed above. Several private weaving schools have been established in major cities such as Tokyo and Kyoto. These are usually business ventures and are expected to make a profit.

One, however—the Kawashima Textile School—was established by the Kawashima Textile Mills to celebrate their 130th anniversary. Under the guidance of Takeshi Kinoshita, who had been a member of the company's board of directors, this school is located in modern buildings with an adjoining dormitory. Studios are well-equip-

ped with looms running the gamut from backstrap to dobby. There are one-year comprehensive courses as well as shorter workshops, lasting from three days to six weeks. Students may also choose an area of specialization and work on a longterm or short-term basis. Techniques taught range from contemporary fiber art and non-woven structures to tsuzure (fingernail weaving) of tapestry and kasuri (ikat). Most instructors come just one or two days a week, but some are full-time faculty. A few are fluent in English, but most are not. Tuition at these privately-owned schools varies from about \$150 for a 3-day workshop to \$3000 for a one year basic course.

Small group instruction. The last category is that of small group instruction at the studios of private teachers. Usually there are six to ten students at one time, each working on techniques of his/her choice. Japanese houses are very small and one of the things which makes this type of instruction feasible is the use of looms which allow the removal of the backbeam, harnesses, reed, warp, and fabric. These are stored, and the following student puts his/her warp and woven fabric onto the loom when needed. Because the fabric is attached to the front of the loom with an inserted tension bar, it is possible to continue weaving without damaging the fabric. Most private instructors teach weaving two or three days a week, with different students coming each day. The remainder of the time is spent on their personal work. Instruction fees vary, but average from \$35 to \$50 per month. There seems to be good feelings of camaraderie in the studios I visited.

COMMENTS AND CRITICISM

This final section involves editorial comments and reflects my personal opinions and criticism as I've viewed Japanese weaving instruction during the last decade. The first concerns design, We Americans generally advocate original-

ity in producing any creative product. As a university art educator, this is primary in my personal teaching. However, Japanese designs have been copied for generations and it is very common for students to directly copy something from the master or from another student or a book.

When I've discussed this with Japanese weaving instructors, some have told me they believe that it's a good learning experience and that the student's work is always different from the original. So when one visits weaving schools, it is not unusual to see students weaving fabrics that are near-duplicates of traditional ones. Perhaps this is a good way to learn a particular process, but I found myself feeling very guilty when I copied a traditional turtle design for an ikat weaving (the only time I've ever copied another design). But other students and the instructor thought it was the usual procedure and, in fact, seemed surprised that a foreigner could do it so well on the first attempt. The foreign student should expect that she/he may be asked to look at traditional designs and work from those, making minor variations only.

As a result of this attitude about design, traditional and historical influences are commonplace when one views Japanese weaving. The same colors, techniques and designs are repeated over and over, although some variation exists, of course. There are traditional "rules" about pattern elements and color combinations that greatly influence the designs, especially of kimono fabrics, and I feel certain that these are deeply ingrained into the consciousness of Japanese people interested in fabrics.

Nevertheless, there are some teachers who believe that new weaving must develop from one's own personal philosophy and feelings, so that an important statement is made through the woven piece. Students studying under those teachers have a broader range of



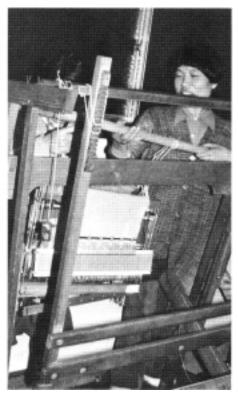
4. Removing cloth from student loom; note tension bar which attached cloth to front beam

weaving experience and the products seen in a student exhibition are considerably more varied. Professor Hideho Tanaka of Musashino Art University, told me that he's most concerned about the ideas embodied in the work and that the technique is the means, not then end.

RECOMMENDATIONS

There are some personal recommendations I would like to make to any one who plans to study weaving in Japan. First, it is almost essential to know some Japanese language before beginning to study. While a few instructors are very fluent in English, one cannot communicate with other instructors or students unless it can be done in Japanese—a very lonely and frustrating experience for some people.

Second, I would recommend that a student visit a number of schools and/or personal studios to see the kind of work being done. Approaches to design and technique differ greatly among teachers. If a teacher is specializing in kimono fabrics using silk set at 40 ends per

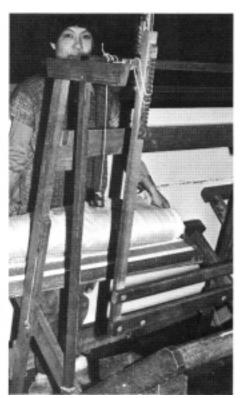


5. Etsuko Dohi and student removing warp from loom

centimeter (102 epi), this, in itself, may prove to be frustrating to a student who is used to weaving fabrics at 12 ends per inch (50/10 cm).

Also, it is important for a foreign student to see the equipment available. Some shops I've visited are very well-equipped, with every tool available immediately, as in the Kawashima Textile School. But in other situations, there is poor equipment and students are expected to "make-do" or wait until necessary tools become available. This can also lead to frustrations. Other schools have such small working spaces that Americans who are used to more private space may have difficulty in adjusting to it.

If a foreign student is going to study in Japan during the winter months, the problem of adapting to the lack of heat in Japanese buildings may cause concern. Some are warm, but others are very cold, with almost no heat available, and trying to weave with cold hands can be stressful. I personally had several weeks of working in a room without heat and found it almost



6. Etsuko Dohi putting new warp onto loom

impossible to tolerate.

A foreign student should also be very explicit about what his/her personal goals are and make sure that they are understood by the instructor. Usually, there is flexibility in the instruction available, but sometimes the curriculum is set and one must go step-by-step with the other members of the class. An understanding of the working schedule is also essential.

A few schools and instructors are listed below, but this is not intended to be comprehensive. Appointments are *very* necessary before visiting and therefore phone numbers and mailing addresses are given.

Tokyo Zokei Daigaku Motto Hachioji 3-2707 Hachioji-shi Tokyo-to 193 (0423) 75-4850 Professor Akiko Shimanuki

Tanaka
Kogyo Gijitsu
Center—
Tokamachi
Shikenjo
Gakko-cho
Tokamachi-shi
Niigata-ken

Private university Weaving and fiber art

Wide exhibition record

record Technical school Weaving/dyeing/ design Musashino Art University Private art university

Department of Weaving and fiber

Department of Textile Design 1-736 Ogawamachi Kodaira-shi 187 Tokyo-to (0423) 41-5011 Professor Hideho

Wide exhibition

Tokyo Textile Institute 5-15-1 Himonya Meguro-ku Tokyo 152 (03) 710-1211 Mr. Tetsuo Miyake, Director Privately owned Weaving/dyeing/ design Basic courses Special workshops

Kawashima Textile School 418 Ichihara-cho Shizuichi, Sakyo-ku Kyoto (075) 741-3111 Mr. Takeshi Kinoshita,

Weaving/dyeing/ fiber art Basic courses Special workshops

Etsuko Dohi 1-12-6 Jingumae Shibuya Tokyo 150 (03) 408-2866

Director

Private instructor Publishes periodical

Akie Kaneuchi 2-24-14 Minami Oizumi Nerima-ku Tokyo 177 (0424) 21-9049

Private instructor

Hiromi Izumi 20-3-101 Saneicho Shinjuku-ku Tokyo 160 (03) 355-1145

Private instructor

Noriko Nitta 8-14 TAkaramachi Naka-ku Hiroshima-shi Hiroshima-ken 730 (082) 249-0410 Private instructor

ABOUT THE AUTHOR: LaVonne Schrieber began weaving in 1948, while living in Albuquerque, New Mexico, Although she has attended several short-term weaving workshops, she is basically self-taught. For several years she produced one-of-a-kind fabrics for interiors, then returned to university study and earned an Ed. D. degree in Art Education. She is now an Associate Professor at the School of Art at the University of Denver.

LaVonne has exhibited her work in a number of national juried shows. In the summer of 1973 she traveled to Japan and attended a three-week workshop on Japanese Textile Dyeing at the University of Arts in Osaka. She has returned to Japan several times to continue her research in Japanese weaving. A sabbatical leave in 1982-83 provided her with another opportunity to go to Japan and to work on a book. Japanese Weaving Techniques, which is scheduled for publication in the fall of 1984 by Hastings House Publishers, Inc.

PATTERN MASTER 1



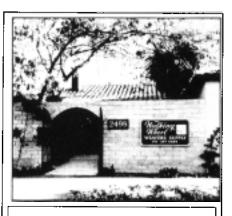
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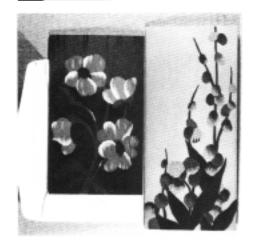
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BORGS BOMULLIN (COTTOLIN)

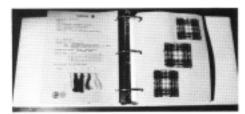
Borgs Bomullin (cottolin) is a 50/50 cotton linen blend, size 22/2. It comes on 250 g tubes and has a yardage count of 6500 m/kg or 1775 yds/tube. The color selection is excellent. The retail price is approximately \$8.00 to \$13,40/tube.

Cottolin is a favorite varn for garments. It is easy to weave with and launders well. The opinions about the correct sett for this yarn vary widely. If the fabric is washed in hot water and dried in a dryer, there is a considerable amount of shrinkage (20%) and therefore the web should be quite loose while it is on the loom. I like a sett of 15 epi to 18 epi (60 to 70/10 cm) for plain weave and 18 epi to 24 epi (70 to 95/10 cm) for twill. Many weavers prefer a much closer sett. Repeated washings soften the cloth to the point where it can be worn with little or no ironing.

Inquire at your local shop or at Glimakra Looms 'n Yarns, P.O. Box 16156. Rocky River, OH 44116.

BORGS SWATCHBOOK-WOOL

This book is a set of looseleaf pages (heavy card stock) bound in a large 3 ring binder. It is a treasury of handwoven swatches made with Swedish woolens which are marketed under the name BORGS and distributed by Glimakra Looms in Yarns. The book has two parts. Part I, entitled "setts and finishes" shows how to make good use of all the types of wool that Borgs supplies. The swatches demonstrate



how the sett and fabric finish affects the hand of the woven cloth. The weave structures for this section are plain weave and twill and woven in an exciting color range. Going through these pages is a pleasant learning experience and an excellent guide for weaving fabrics with a hand that is appropriate to their use. Part II, entitled "Patterns and Textures", shows how Borgs woolens can best be used alone or in combination in order to create exciting textures. Some of the weaves are a bit more complex than those in Part I but the instructions are excellent and easy to

This book is a real treat and should be available for browsing at all shops that sell Borgs yarns. If you want to own your own, send \$69.00 to Glimakra Loom 'n Yarns, P.O. Box 16157, Rocky River, OH 44116.

IHANA BRUSHING SERVICE

Please correct address in Issue 28, p. 53. 3605 Hartford, St. Louis, MO 63116

PRODUCT NEWS

GLIMÁKRA LOOMS 'N YARNS, P.O. Box 16157 Rocky River, OH 44116, has added a new BORGS yarn to their wide selection of imported Swedish natural yarns. BOMULLS-GARN 2/2 is a 100% soft two-ply cotton. The put-up is in 100 g skeins. There are 160 m/ skein or 790 yds/lb. There is a selection of 37 colors. Retail price \$4.90/skein



SCOTT'S WOOLEN MILL, Hecla Street and Elmdale Road, Uxbridge, MA 01569, is a wholesale and retail establishment specializing in high quality domestic yarns. Their yarn samples are displayed on 26 cards. Each card shows the complete color range. The cards are marked with the name of the yarn and the colors, the fiber content, the put-ups, the yardage per unit of weight and the "weight category" which is mostly for the benefit of

knitters and crocheters. Price lists and order blanks are on separate sheets. Wholesale price lists are available to qualifying busi-

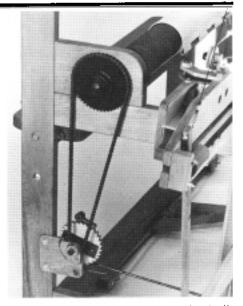
In addition to their standard line of yarns. Scott's also has a large selection of mill ends and "close outs" which are bargain priced and limited in quantity. The complete sample set

The information from Scott's Woolen Mill is easy to use. The yarn samples are varied in texture, size and fiber content and are a true inspiration for successful projects

COTTON CLOUDS, P.O. Box 604, Safford, AZ 85546, is a wholesale/retail establishment specializing in cotton. Of special interset is their 8/2 unmercerized cotton available in 60 colors and their perle cotton which comes in sizes 3/2, 5/2, 10/2, 20/2 and is available in 45 colors. Send \$2.00 for catalogue and yarn

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matic Cloth Advance System mechanically advances the warp with each beat. The system is designed to maintain an even beat throughout the warp even after changing weft material.

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W.I

LET'S PULL TOGETHER by Clotidle Barrett

There is no doubt that every weaver is aware of the confusion in the terminology and conventions which handweavers use. For publishers of books, magazines, software for computers, this problem is a big, big nightmare. Everyone agrees that something should be done about it. The question is how? Well, let's pull together. In this article you will find a series of terms, conventions and definitions. I am advancing some opinions and some suggestions. You are invited to join into the discussion. Please write to us and make comments. Everyone's input will be published here in The Weaver's Journal. We will arrive at a set of conventions and a vocabulary that the majority of us can live with and then we will fight for the adoptions of these terms by all handweavers in the U.S.A. Agreed?

There are three basic areas to discuss: Vocabulary, conventions for drafting and spelling.

WEAVING VOCABULARY

What exactly means what? Even if we think that we all speak English, we realize nevertheless, that there is a difference between British and American. Even among Americans, words may have different meanings. Your own vocabulary depends greatly on the teachers and books from which you learned your weaving skills.

We are lucky to have Irene Emery's book "The Primary Structures of Fabrics" in which fabric structures have been classified and the use of terms carefully researched. Her work has always been a guidance to me and is the basis of all the definitions I am proposing here.

The problem of harness versus shaft was brought up in the letter from the editor in the Winter 82-83

issue of *The Weaver's Journal*. The response of our readers did show that most weavers are concerned and that such problems have been nagging them. They were happy to be asked to express an opinion. In general, weavers who based their choice on usage and historical data had strong arguments in favor of harness. Those looking to the future and to the availability of more complex looms, favored shaft.

The problem of harness versus shaft is an important one but is by far not unique. Let's air out some of the other problems concerned with the exact meaning of words and discuss their right (or wrong?) usage.

If words are used here that are not defined and not understood, the reader should refer to the book mentioned above by Irene Emery.

WARP—The warp is the entire set of threads which is interlaced by the west (or filling) to produce a cloth. A fabric may have two warps: a ground warp which usually interlaces in plain weave and a supplementary warp whose threads make decorative pattern floats. Double weave and warp-backed fabric have also two warps.

WARPTHREADS—WARPENDS—They are the individual elements of the warp. One working warp end may consist of 2 or more threads. However these threads are counted as one and are always sleyed in the same dent and threaded through the same heddle.

WEFT—The west is the entire set of cross threads which interlace with the warp. Most fabrics have one west. Some weaves call for a ground west and a supplementary west, thus two wests. Double weave and west-backed fabrics also have two wests. The weaving industry favors the word FILLING. It has the same meaning as west.

WEFT PICK—WEFT SHOT—Both words mean the same and refer to the passage of one weft element from one selvedge to the other.

THREADING—The order in which the warp is threaded through the heddles of the shafts.

THREADING DRAFT—The threading as it is symbolized on graph paper (see draft conventions).

DRAW—The word is derived from the expression "drawing the warp threads through the heddles" which is now called "threading". It is only used in the expression "straight draw". On an 8-shaft loom a "straight draw" means "threaded (1, 2, 3, 4, 5, 6, 7, 8) repeat."

TREADLING—The order in which the treadles are used. Only in a "practical treadling" designed for looms with insufficient treadles should one be allowed to use two treadles at the same time. As a rule one treadles lifts one or more shafts, opens a shed and allows the passage of a weft pick.

Some looms such as table looms and dobbies, have no treadles nor tie-up. In such cases, the words treadling and tie-up become meaningless. Both functions are combined and become the "lift plan" for a table loom (order in which the shafts are lifted) or a peg plan for dobbies (pegging of the lags and their sequence in the chain).

TIE-UP—The way the treadles are tied to the shafts.

DIRECT TIE-UP—The treadles are each tied to one shaft. Treadle 1 to shaft 1, treadle 2 to shaft 2, etc. This is often a practical tie-up used when the loom has insufficient treadles. Such a tie-up is then used with a "practical treadling" in which two or more treadles are used at the same time.

PRACTICAL TIE-UP—When the loom has less treadles than is required by the weave structure, the weaver ties the available treadles to certain combinations of shafts. The combinations are carefully studied so that, by using a practical treadling and thus several treadles at one time, all the necessary sheds can be opened.

SKELETON TIE-UP-There is really no reason for using this lugubrious word.

DRAWDOWN—Graphic representation of the interlacement of warp and weft.

Under the heading "draft conventions" I give good reason to strike that word out of our vocabulary. I'd like to see it replaced by "interlacement", "weave draft" or "weave structure". My choice is "weave draft".

PLAIN WEAVE-Any fabric or part of a fabric that has an underone-over-one interlacement with one pick and interlaces in the opposite way with the next. The weave may be balanced (50/50 or as many ends per inch (epi) as picks per inch (ppi) or may be warp-faced or weft-faced.

TABBY-A tabby pick is a plain weave pick that is thrown as a binder between two pattern picks. Tabby picks form a balanced plain weave ground on which a supplementary warp or weft makes pattern floats. Tabby picks are used in overshot and Summer and Winter. The word binder may often be substituted but all binders do not weave plain weave while tabby

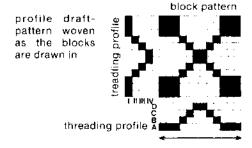
PROFILE—Some threadings have recognizeable units such as the 4 4

2.3 landl ⊿in Summer units and Winter. Each unit may be repeated ad lib., and thus forms a threading block. Such blocks may be drafted on graph paper. In a threading profile each column stands for an entire unit while in a regular threading each column stands for one warp end. The profile units are drafted as black squares and the treadling blocks

are named with capital letters A, B, C, etc.

One weaves pattern in a block if the interlacement of that section of the warp with the weft is such that the floats of the weave structure (warp floats or weft floats) are visible on the face. The other threading blocks which are woven at the same time are either woven as background or as half tones (a structure that is neither background nor pattern).

Some treadlings have recognizable units, each of which may be repeated ad lib, to form a treadling block. The draft of these blocks is a treadling profile. Each square of such a draft represents one treadling unit. The treadling blocks are named with Roman numerals I, II, III, etc.



WEAVING AS THE BLOCKS ARE DRAWN IN-Treadling block I weaves pattern in threading block A, treadling block II weaves pattern in threading block B, etc., and if the treadling profile is the same as the threading profile, then the fabric is woven as the blocks are drawn in.

WEAVING AS THE THREADS ARE DRAWN IN-If an n-shaft threading has n treadles and each of these treadles is numbered and has a known tie-up, and if the treadling order is the same as the threading order, then the weaving is as drawn in.

DRAFT CONVENTIONS

The problems of our weaving vocabulary are serious enough but handweavers seem to disagree even more about the ways a draft should be written and read.

In order to point out the problems, 4 contemporary methods of drafting in the U.S. are illustrated here.

Fig. 1. The method advocated by Harriet Tidball, (cf: The Handloom Weaves by Harriet Tidball, HTH Publishers, P.O. Box 468, Freeland, WA 98249). This method is the most popular among US weavers today.

Fig. 2. The method used in The Weaver's Journal. Because of my great respect for H. Tidball and in recognition of her work in handweaving, the drafting system of The Weaver's Journal is based on the one of Fig. 1.

Fig. 3. The method I propose to be adopted by all publications and weavers.

Fig. 4. The method which is used by the textile industry and on which all drafting systems outside the U.S. are based.

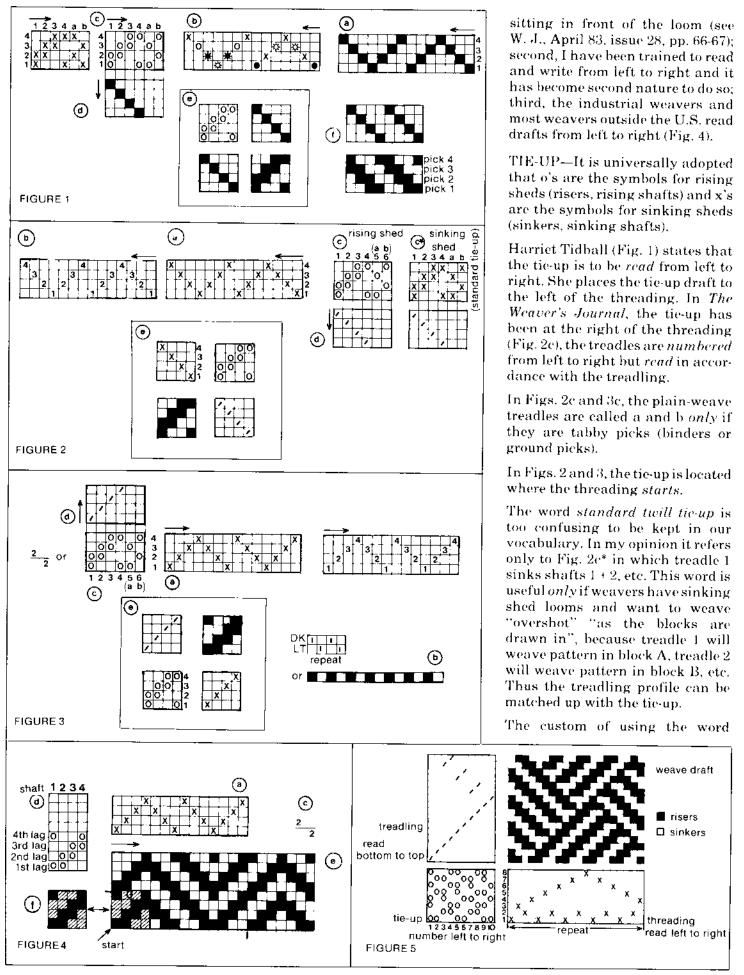
THREADING— $The\ shafts\$ are generally numbered from bottom to top. The bottom row of the graph corresponds to the shaft closest to the weaver. The numbering is usually done on the side that the threading starts. See Fig. 1a, 2a, 3a. In Fig. 4 this is considered irrelevant and there is no numbering.

The warp ends are represented by \blacksquare or by color symbols (Fig. 1); by x's, color symbols or numbers (Figs. 2 and 3); by x's or symbols other than **■** (Fig. 4).

Note that I like to avoid color symbols in the threading or treadling and prefer to have a separate draft for "color order in the warp", "color order in the weft". Fig. 3b* shows two methods of drafting a 1/1 alternation of dark and light in the warp for one threading repeat.

Note that \blacksquare is *not* used to represent warp ends in the threading of Figs. 2, 3, and 4. I prefer to reserve **f** for the units of a profile draft.

Reading the threading draft is done from right to left in Figs. 1 and 2; from left to right in Figs. 3 and 4. Harriet Tidball (Fig. 1) writes: The draft is written and read from right to left, the direction in which the loom is threaded. This convention was adopted in The Weaver's Journal (Fig. 2) and has proven to be disastrous. First of all, I always thread my loom from left to right



"standard twill tie-up" dates back to the days when most weavers had counterbalanced looms that were always tied up according to Fig. 2c* and it became a standard.

In Fig. 4 there is no tie-up because the draft has to be applicable to looms that have no treadles. If the weave structure should require a twill tie-up a symbol such as is sufficient. It says that the weft (horizontal line) goes under two (warp ends), then over two, and that there is a diagonal progression. For weaves other than twill-based, the tie-up and treadling must be derived from the weave draft.

TREADLING—The treadling is always read vertically. Harriet Tidball (Fig. 1d) recommends reading top to bottom and using ■ for symbols. In Fig. 2d the treadling is read top to bottom using ** for symbols (The W. J. reserves ■ for profile drafts).

There, as in reading the threading draft, I cannot recommend that we stay with the system which H. Tidball advocated.

In countries outside the U.S. and in the industry, the first weft pick is the bottom one. This is most logical as it is equivalent to the position of the first weft pick as it is woven on the loom. On the loom the weaving progresses from bottom to top. Fig. 3d.

In Fig. 4 there is no treadling because there are no treadles. The peg plan shown in Fig. 4d shows that the first lag which controls the shed of the first weft pick is pegged

to lift shafts 1 and 2. This system is the same as the one handweavers use who work with table looms.

WEAVE DRAFT (FORMERLY DRAWDOWN)-Harriet Tidball's system (Fig. 1e) and the one that I have adopted for The W. J. and that is based on it (Fig. 2e), show all their negative points here and it is therefore that I urge all the weavers to support me and adopt the system shown in Fig. 3, Fig. 1e shows the weave draft of a straight twill. Anyone would be tempted to call this a right-hand twill. The diagonal line moves to the right as in yarn with a right-hand twist. However, the diagram of the cloth as it is actually woven (Fig. 1f) shows that the twill, in reality, is a lefthand twill. It is very important that there be no confusion about the direction of the twill. The twist of the yarns used to weave twill depends on the direction of the twill and many fabric designs (such as plaited twills) are entirely based on the changes of direction of twills.

The weave draft has to show the correct direction of the twill!

In Fig. 3 the drafting system gives the correct directions of the twill; it is woven and drafted as a righthand twill.

The weave draft of the industry is shown in Fig. 4e. The first weft pick is shown by the bottom row. The first warp end is the outer left column. The lines outside the diagram delineate one repeat (14 warp ends, 4 weft picks). Notice the relationship between the weave draft (Fig. 4e) and the peg plan (Figs. 4d and f).

SINKERS AND RISERS—In the weave draft (or interlacement diagram of the warp and the weft) a black square stands for a "riser" which means that at this point the warp is lifted and the weft passes under the warp. The white squares \square are sinkers.

If one deals with weaves which have a supplementary weft, such as overshot and Summer and Winter, the weave draft as it is described above is not very useful in visualizing the pattern. For such weaves, one needs a draft of the pattern weft only. The pattern weft is drafted by means of horizontal lines (colored if possible) which show the well floats on the face of the cloth. The tabby which is structurally the most important element of the fabric is not shown at all. This draft should also be written and read from bottom to top.

SPELLING

Many textile terms have more than one—correct—spelling: Woollen-woolen; selvedge-selvage; sett-set; heckle-hackle (flax); braking-breaking (flax); fiber-fibre, etc. As long as the dictionary approves of the spelling. I believe we should too. At this time we have more important things to agree upon. For the time being, let it be the publisher's prerogative to choose the spelling that he she prefers.

Fig. 5 shows again the drafting system which I hope weavers will adopt.

Please send me your comments and suggestions.

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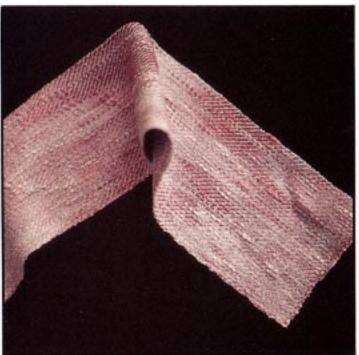
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SPACE DYEING WITH FIBER-REACTIVE DYES

by Linda Knutson





Variegated yarns are becoming increasingly popular among those who work with fibers. Because of the yarn's constantly changing pattern of colors, effects can be created that wouldn't be possible using conventionally dyed skeins. The subtle-colored variegated yarns, when knitted or woven, give a soft, flowing movement of color to the fabric, while the more dramatic-colored yarns create a look that is alive with the vibrant excitement of contrasting hues. Used as an accent, the multi-colored yarns give a subtle emphasis of color; there is no strong vertical or horizontal pull of the eye as a result of the color changes in the yarn.

Through a process known as space dyeing, it is possible to create your own variegated yarns. Dyers have the added advantage of custom designing their own skeins to obtain any desired color combination, and to give their work a unique and distinctive appearance. In addition, these yarns can be produced for a fraction of the price it costs to buy them.

The method used to obtain a variegated effect depends on the type of dye being used. This article will concentrate on space dyeing with the fiber-reactive dyes. Fiber-reactive dyes such as Procion MX and Cibacron F are used to dye all cellulose fibers including cotton, jute, linen and rayon (a man-made cellulose fiber). Silk, a protein fiber, can also be easily dyed with the fiber-reactive dyes.

Before any dyeing begins, it is helpful to have an understanding of the dyes being used and how they react in the dyepot. A knowledgeable dyer is free to experiment with the dyeing process to produce some interesting color effects. An ignorant dyer, however, may unknowingly affect the fastness properties of the dyes, cause a large portion of the dye to be wasted, or even endanger his or her health by mishandling the dyes.

Fiber-reactive dyes form a very strong chemical bond (covalent bond) with the dydroxyl groups (*OH) found in both cellulose fiber and water. Unfortunately, any of the dye that reacts with water is wasted and ends up going down the drain. To help reduce the amount of dye that is wasted, table salt is added to the dyebath. The salt lowers the solubility of the dye in water which, in turn, favors dye adsorption by the fiber.

The amount of salt and water used when space dyeing is calculated in the same manner as for immersion dyeing. Instructions are available

from any distributor selling the dyes. Choose a large enough dye bath container (for example, a large plastic dish), so that the yarn can be spread in a single layer. If the amount of water added to the dye bath completely covers the yarn, reduce the volume so that the top portion of the skein extends above the water level. It is important for dyers to avoid using more water than the dyeing procedure requires; an excess weakens the dye results since more water is available to react with the dye. The yarns to be dyed can either be scoured and damp when placed in the dye bath or dry. Experiment to see the different effects that can be produced.

Any color combination desired can be used when space dyeing; colors close in hue or value give a subdued color effect, while distinct contrasts in hue and value create a bolder appearance. Dye samples serve as a useful reference when making color choices because the dyer already knows how the colors will appear and the formulas required for mixing them. If unfamiliar with how a dye color will look, first dye a sample and record the results for future use. Turquoise is a difficult color to work with when space dyeing. If you are using this color as part of a mix, experiment first to see if the results are acceptable.

After the color choices have been made and the dye formulas worked out, mix the dyes to be used in separate containers. Clear plastic cups are convenient. Again, refer to the dyeing instructions normally used to determine how much of each dye color is needed for the weight of yarn being dyed. Then mix up about twice as much of each dye color as would be normally used. Experience will help determine how much dye solution is needed to obtain a particular result. Then apply the dyes directly to the yarns with the effect that is wanted determining the placement of each dye color. Value contrasts are achieved by varying the quantity of dye that is added. The more dye

that is applied to a particular area, the darker the resulting color; conversely, a pale value is achieved by simply using less dye.

A syringe (minus the needle) works well for applying the dyes as opposed to pouring them on. Not only does its use allow for better control, but its shape makes it possible to get some of the dye down into the skein. When solutions are poured on, the underside of the yarn often does not come in contact with the dyes. Never stir the dyebath when space dyeing!

Once the dyes have been applied, it is necessary to wait for a sufficient period of time to give them a chance to be adsorbed by the fiber. Although the dyes do not bond chemically with the fiber at this time, this step is necessary to allow as much dye as possible to diffuse into the fiber; otherwise, the dyeing will be weakened, with more of the dye reacting instead with the water.

It is not until sodium carbonate*, an alkali, is added to the dyebath that the dye chemically bonds with the fiber. The sodium carbonate raises the pH of the dyebath (makes it alkaline) which allows the dye reaction to occur. Dissolve the sodium carbonate in a small amount of hot water and then, either by pouring from a cup or drizzling with a syringe, apply the solution directly to the fiber. As in the above step, give the dye sufficient time to react completely with the fiber.

After the dye reaction is completed, it is important to follow carefully the distributor's recommendations for rinsing the fiber. The dye that has reacted with the water in the dyebath is still attracted to the fiber and must be completely removed, requiring a three-step washing procedure. If this process is not followed, the fiber will bleed when washed.

In addition to the color variations achieved by working with several dye colors and varying the amounts applied to different areas of the yarn, it is possible to obtain some subtle color nuances by dyeing a variety of cellulose fibers together in the same dyepot (See photo 1). Rayon, mercerized cotton. silk, linen and unmercerized cotton, for example, will each take the same dye somewhat differently. In general, viscose rayon will dye the deepest followed by mercerized cotton, linen and then unmercerized cotton.

An ikat-like effect can be obtained by space dyeing the fiber after it has been warped (See photo 2). Prepare the warp in the usual manner but, in addition to the ties used to mark the cross, secure the warp approximately every one to two yards with a piece of wool yarn loosely tied (to avoid a tie-dye look) in a figure-eight fashion. This will help to prevent the warp from tangling in the dyepot. The warp can be loosely chained before dyeing.

Don't be afraid to experiment with the space dyeing process described in this article to develop your own personalized approach. Many variations are possible, as long as the method meets the requirements of the dye reaction. Beautiful and exciting color effects in yarns can be created by space dyeing; the fiber artist who is also a dyer is free to explore this technique to develop the look he or she is after.

ABOUT THE AUTHOR: Linda Knutson is a dyer and garment weaver in Yakima, Washington. She has written the book Synthetic Dyes for Natural Fibers (Madrona Publishers, 2116 Western Ave., Seattle, WA 98121), and produced the dye sample notebook "Shades of Wool" (Shades of Wool, Rt. 4 Box 263 B. Yakima, WA 98908) for the Kiton-type acid dyes. As a weaver, she works with an inventory of just white yarns in many different textures and fibers and dyes only the amount of yarns she needs for a particular project in the colors of her choice. Linda also teaches synthetic dye workshops where she emphasizes a controlled method of dyeing so that colors can easily be reproduced for any fiber weight. And, it is not unusual for students to leave the workshop with close to 400 color samples for their reference notebooks. In addition, Linda does custom dyeing for other fiber artists. She is a member of Desert Fiber Arts and Fiber Artists of Central Washington.

^{*}Dyers have traditionally used washing soda as their source of sodium carbonate. Recently, the manufacturers of this product "improved" it by adding bleach which, unfortunately, interferes with the dye reaction. Sodium carbonate should now be purchased from dye distributors.

Deadline for Fall (October) 1983 issue is August 1.

Mesa, Dec. 1, 1983, 6th Annual Vahki Juried Competition. Slides due for jurying from Arizona, Colorado, New Mexico, and Utah. For information write: Cultural Activities Department Gallery, P.O. Box 1466, Mesa. AZ 85201

CALIFORNIA

Fullerton, Aug. 14-Sep. 5, 1983. Weavers tour to Ireland and the United Kingdom, Offered by the Fullerton Travel Center with Barbara Baggeroer as director and educational guide Tour is eligible for college credit. For information, Barbaia Baggeroer, 2930 Sequoia Avel, Fullerton, CA 92635

Ventura, Nov. 4-27, 1983. Ventura County Handweavers Guild Fall Show and Sale. Held at Ventura County Historical Museum 100 F Main St. Ventura, CA 93001. For more information contact, Jan Reynolds Eubank, Venture County Handweavers Guild, P.O. Box 7211, Ventura, CA 93006

COLORADO

Durango. July 14-19, 1983. Intermountain Weaver's Conference on the campus of Ft. Lewis College. Workshops. Senitinars Demonstrations Commercial Exhibits For information send SASE to Lois Self, 8550 € Cum PL, Tricson, AZ

Copper Mountain, Aug. 13-14-1983. Third Annual Homespun Arts and Crafts Festival Exhibition, sale entertainment Held at Copper Mountain Resort. For more information write: Jackie Bensinger, P.O. Box 3003, Copper Mountain, CO 80443

CONNECTIOUS

Guilford, Jul. 14-16, 1983, 26th Annual Guilford Handcrafts Exposition sponsored by Guilford Handerafts, Inc. Application deadline Jan 31, 1983, Write, Guilford Handcrafts EXPO 83 Box 221, Guilford, CT 06437

Guilford, Oct. 9-29, 1983. Traditional & Contempory Baskets 8 Quilts Original work Juried Held at Guilford Handcraft Center Deadline Aug 1 For information send SASE to Fernin Hubbard: The Mill Gallery at GHC, Box 221, Route 77 Guilford, C1 06437

GEORGIA

Atlanta, Oct. 6-9, 1983. Atlanta Craft Show. Held at Atlanta Civic Conter, Entries will be judged. Commercial booths. For information, write. Dean, G-hette, 1931. Peachtree, Rd., NE. Atlanta GA 30309

ILLINOIS

MI. Vernon, Sep. 10-11, 1983. Seventh annual Cedarhurst Craft Fair Sponsored by The Milchell Museum and held on the museum grounds. Exhibits displays demonstrations. For more information write. Cedarhurst Craft Fair, P.O. Box 923 Mt Vernon II 62864

Chicago, Nov. 6, 1982-Jan. 2, 1983, Magdalena Abakanowicz retrospective to premiere in Chicago. This retrospective surveys her work of the last 20 years, from her monumental, three-dimensional woven sculptures of the mid-1960's to early 1970's -- the Abakans -- at The Cultural Center to her cycles of sculptures based on the human figure dating from the 1970's to the present and collectively called the Alterations at the Museum of Contemporary Art. A recent group of large drawings will complement the sculptures. The installations at each location will be conceived of as total environmental works of art by the artist who will travel from Poland to execute them personally.

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Oregon - Feb. 28-Apr. 22, 1984.

Dailas Museum of Fine Arts. Texas - Jun. 21 Aug. 19, 1984.

Frederick S. Wright Art Gallery. the University of California. Los Angeles - Sep 23-Nov 11 1984 Following its North American tour the exhibition will be

presented at distinguished museums in Japan

Ames. Jul. 6-9 1983. Heirloom to Heirloom Quitters Conference '83 Held at Brunnier Gallery and Museum, Scheman Building Iowa State Center, Ames, IA 50010 Keynote speaker, Mana McConnick-Snyder

COMING **EVENTS**

KANSAS

Wichita, Oct. 16 Nov. 20, 1983 il Kansas Fiber Directions 183 will he held at the Wichita Art Museum, Wichita, KS, Co. sponsored by the Wichita Handweavers. Spinners and Divers Guild and the Wich ta Art Misserm, Juned, Fig. information write Kansas fiber Directions 83, 4039 € English Wichila KS 67218

MARYLAND

College Park, Sep. 23-24, 1983. Symposium on the historical aspects of coverlets and their significance. Ken Colwell's collection. "The Woven Hedord" will be on exhibit through Oct. 23. Held and exhibited at the University of Maryland College Park campus. For more information write. Jo Paoletti or Clarita Anderson, University of Maryland, College Park, MO 20742

MASSACHUSETTS

Amherst, July 13:17, 1983. Refore NEWS workshops. Study with Mary Elva Ert. Antionia Kormos, Patricia Lyster, Douna Muiller, Marge Rohrer, Mary Snyder, For information write Mrs. Mary Yusko, 17 Stanley Road, Norwell, MA 02061.

Amherst, July 17-22, 1983, Weavers' Schman, University of Massachusetts, Amherst MA 01002 Keynole speaker Max Lenderman, Special interest groups, Lectures, Swap sessions Room shows For information write, Mrs. Mary Yusko, 17 Stantey Bond, Norwell, MA 02061.

MISSOURI

University City, "Missouri Art and Craft Fairs 1983, is now ready for distribution. To order send \$2,00 and SASE to Craft. Alliance Education Center, 6640 Delinar Blvd., University City MO 63130

Bozeman, July 4-8, 1983. Eleventh Biennial Conference of the Association of Northwest Weaver's Guilds entitled Fiber Flair sponsored by The Bozernan Weaver's Guild, Held on Montana State University campus, Workshops, Seminars, Commerical Exhibits, Sample Exchange, For information SASE to Ellen Alvord 221 Ridge Trail Ad. Bozeman, MT 59715

Laurenceville, July 29-31, 1983. The Mid Atlantic Fibre Association is soliciting resumes and class outlines from teachers interested in mini-sessions of the 2nd Mid Atlantic Fibre Conference For information write Kava Schafer Weisel Youth Hostel R D 3, Quakertown PA 18951

Los Alamos, Jul. 29 Aug. 21, 1983. New Mexico. Three Cultures. One Magic" a tri-cultural exhibit of work by Iridian. Spanish and Anglo artists, will open at Fuller Art Center, Los Alamos, NM, For additional information write: Karen Noll Puricker, P.O. Box 790. Lis Alamos, NM 87544

Las Cruces. Mar. 1-25, 1984. Handwoven 1984, a juned show will be displayed at the New Mexico State University Museum, Las Cruces, NM 88003. For a prospectus write. Helen Garner, New Mexico Weavers Conference, 1105 Calle del Encanto, Las Cruces, NM 88005.

Las Cruces, Mar. 23-25, 1984, Second New Mexico Weavers Conference hosted by Mesilla Valley Handweavers Guild Workshops, seminars tashion show commercial exhibits juried show. For more information contact. Nacy Spreng 1105 Calle del Encanto, Las Ciuces, NM 88005

Syracuse, Aug. 27: Sep. 5, 1983. New York State Fair Weaving. Competition Open to all weavers, Judged competition, Entry deadline: Aug. 8, 1983. Schedule and entry form. Art & Flome Center Catalog, New York State Fair, Syracuse, NY 13066 Inquiries, Beverlee Baker, 908 Kinnry Moor, Fayetteville, NY

Syracuse, Sept. 24-25, 1983. Central New York Hand. Spiriners Seminar sponsored by The Golden Fleece Spin-ning Society of Baldwinsville, NY, For information write Golden Fleece Spinning Society, cho Mrs. Betsy Walker, RD 1 Breed Rd. Baldwinsville NY 13027

Croton-on-Hudson, Sep. 24-25, 1983, 9th Annual Croton Graft Fair sponsored by the Croton Lions Club and the Westchester County Dept of Parks, Recreation and Conservation Held at Crolon Point Park For more information write Monya Brown, 33 Lexington Dr., Croton on Hudson, NY

NORTH CAHOLINA

Brasslown, Jul. 3-30, 1983, Workshops, Spinning, dyeing, weaving. For information write John C. Campbell Folk School Brasslown NC 28902

PENNSYLVANIA

Monroeville, Sep. 30-Oct. 2, 1983. Eastern Great Lakes Fiber Conference Held at West Wing of Expo Mart, Fash-on show Exhibits Commercial Exhibits For information write Peggy Cost Peliz, 101 F. Pittshurgh St., Delmont, PA 15626

TENNESSEE

Gallinburg, Exhib tions at Arrowment School of Arts and Crafts Jun 5-Aug 19 1983 Arrowment Faculty "Mixed Media Aug 22 Sep 20 1983 Arrowment Permanent Art Collection Exhibitions Sep. 26 Oct. 29, 1983. "Focus the Artist, exhibition of surface design work. Sep. 26-Oct. 29. 1983 - From the Collection of an exhibition of historic surface work from the coilection of contemporary surface design artists.

Gallinburg, Sep. 26-Oct 1, 1983 | Surface Design 83/The Artist in Focus 1 Major presentations and workshops by Lenore Davis, Ana Lisa Hedstrom, Ina Közel, Edward Lam bert, Pamela Scheinman & Shigeko Spear Demonstrations Exhibits: For more information write: Arrowment School of Arts & Crafts P.O. Box 567, Gatlinburg, TN 37738

Gatlinburg, Nov. 5, 1983-Jan. 7, 1984, National juried exhibition sponsored by Arrowmont School, 2 and 3 dimensional media. Stide entries due Sept. 10. Julior. F. Clark Stewart, Professor of Art. University of Tennessee, Write. Arrowmont School, Box 567, Gattinburg, TN 37738.

WISCONSIN

Mineral Point, July 7-9 1983. First Annual Conference on the Creation of Complex Weave Structures. The conference will accept papers related to little known historic or ethnic woven structures or those involving innovative concepts and techniques including those pertaining to the utilization or modification of equipment. Submissions should be in one of three areas (a) Ethnic woven structures (b) Historical research, (c) Inhovative manipulation of weave structures. Contributed papers will be allocated 20 min. Send a draft of your paper before the conference. Abstracts of papers should be sent by 10 May 1983 to: Joyce Marquess Carey. School of Family Resources and Consumer Sciences, University of Wisconsin. Martison, WI 53706. For information on accompliation contact Ken Colwell The Looms Shake Rag Street Mineral Point WI 53565

Sheboygan, July 16-17, 1983, Thirteenth Annual Outdoor Arts Festival, Held at grounds and areas adjacent to the John Michael Kohler Arts Center, 608 New York Ave., Sheboygan. WI Juried Entry deadline May 1 1983 5 slides required Exhibitions, Workshops, For more information write John Michael Kohler Arts Center, 508 New York Ave., Sheboygan

Whitewater, July 25 Aug. 12, 1983. The 8th Annual Fiber and Textile Exhibit "A Celebration of Creativity" sponsored by the Whitewaler Spriners and Weavers Guild, Held in the Crossman Gallery on the University of Wisconsin-Whitewater campus. For information write. Sara J. Woods. Rt. 2. Box 144 Whilewater WI 53190

WASHINGTON, D.C.

Textile Museum, Jun. 16-Aug. 21, 1983. "The Scandinavian. Touch" an exhibition of approximately 80 works by 20 textile artists from the countries of Denmark, Finland, Iceland, Norway and Sweden as part of the Scandinavia Today celebration. Wall tapestries, free-standing and hanging sculpture, rya rugs, unique textiles woven of hair, coats. Exhibit at Textile Museum, 2320 'S Street, N.W., Washington, D.C. 20008. For more information write: Debby Striner at the Textile Museum

ONTARIO CANADA

OTTAWA, Oct. 14-16, 1983 Annual Conference of the Ontario. Handweavers and Spinners. Hosted by Outaouais Spinners and Weavers Guild "Options 83" Speaker Helena Hern-marck Juried exhibition seminars, fashion show, guild shows. For information write, Betty Kirby, 89 Reid Avenue, Ottawa, Ontario, Canada K1Y 1T1

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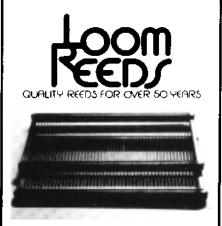
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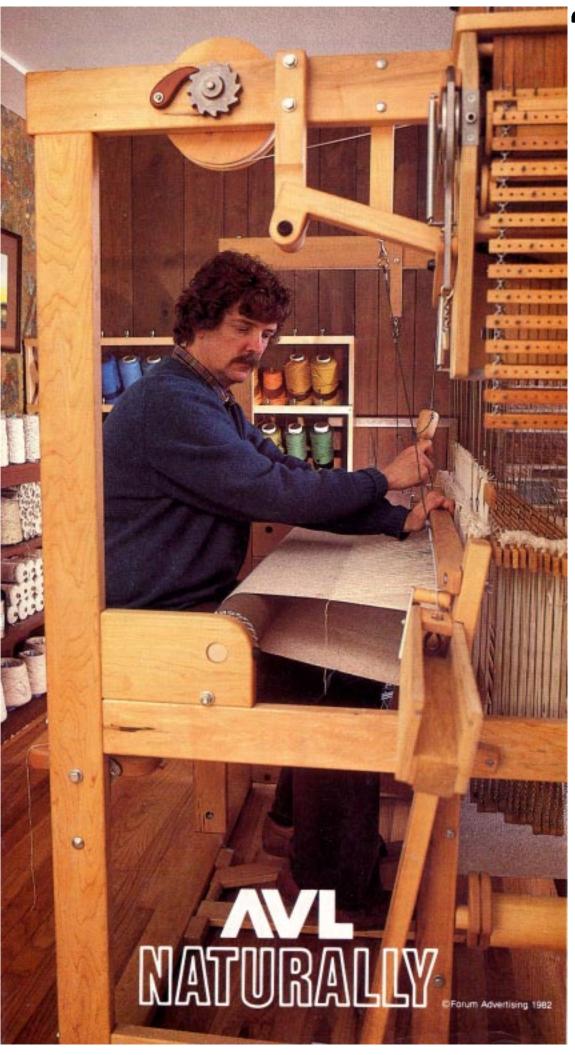
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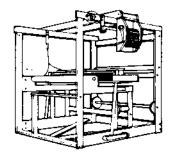
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