SUGGESTIONS FOR THE RECORDING OF DATA ON SPINNING AND WEAVING AND THE COLLECTING OF MATERIAL

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Anyone studying prehistoric and modern textiles produced on primitive looms is bound to be impressed by the astonishing uniformity of technical detail within specific areas. In Peru, where it is possible to make comparisons of material from distinct cultural horizons dating back to the middle of the third millennium B.C. one finds that adherence to traditional practices was very rigid for long periods of time. So much so in fact that there is reason to believe that in yarn and textile production one may find a greater degree of conservatism than in any other activity of non-mechanized peoples.

If this is so, then an accurate knowledge of such features as spinning, twist direction, warping procedure, and construction details may well serve as significant clues in tracing cultural diffusion and relationships. So far relatively little use has been made of the possibilities in this field, partly because of the lack of recorded data and partly through unawareness of what might be accomplished.

In the hope that those who have opportunity to observe yarn and fabric production may be induced to record pertinent facts, the accompanying list of questions was compiled. Some of these admittedly are what any thorough ethnologist would record, but others will perhaps elicit information which might not otherwise be gathered.

Naturally, it is difficult to standardize such questions to fit all environments and situations. Obviously, they must be modified or enlarged to take full advantage of distinctly different opportunities and to clarify what has already been recorded.

In order that the purpose behind them be better understood, a brief review of the basic data illustrated with specific examples is warranted. For instance, in the matter of the fibers utilized, one will normally encounter either the wools, basts, or cottons, but, in the New World, who would think of inquiries about native silk? There are areas in Mexico, as in Africa, where on occasion silk is secured from communal insect nests (those familiar with the ravages of the common tent caterpillar will know what a communal nest is). Likewise in Mexico some people still gather wild cocoons for the silk in them.

While noting information on fibers, one should inquire whether any of them are dyed before spinning. This is rarely encountered today, but knowledge of raw stock dyeing of cotton with seeds attached has persisted in Peru for centuries, though recorded for the first time in 1947. It undoubtedly explains the misstatement dating back to Colonial times that naturally blue cotton was cultivated.

As to spinning direction, there are obviously only two ways in which this can be done, either clockwise (S) or counter-clockwise (Z). The choice would seem to be optional and is for wools and silk, and for these regional custom will be followed. The same appears to be true for cotton, though the claim has been made that some cotton when spun one way will wear slightly better than when spun in the opposite direction. Precise tests to settle the point have yet to be made.

With the bast fibers taken from the stems of some plants the nature of the fibers will dictate the best direction of twist. What this is can be readily checked by moistening single fibers and noting the direction in which they rotate as the moisture affects the cellular structure. If maximum wearing quality is to be achieved in the yarn this is the direction in which the fibers should be spun. In general most of such basts utilized in northern Colombia, Middle and North America are or were S spun, while in the rest of South America Z-spinning of basts predominate. Although no one has yet correlated the distribution of spinning direction with the twist properties of the basts used this broad regional difference seems definitely related to the tendency of some southern hemisphere basts to twist oppositely to the northern hemisphere products.

It would be of interest to know if any bast spinners can explain why they use one direction or the other for bast spinning, and whether relatively brief experience with a fiber will demonstrate which is best. In the oldest fabrics from Peru some Z-spun bast (the correct direction for this particular fiber), is used doubled with a cotton strand, which is spun S in conformance with their traditional handling of cotton. This is definitely an anomaly, for elements of two or more ply yarn should all be spun in one direction and doubled or compounded in the opposite. Yet in making yarn of cotton and bast fibers blended together, the same people handled the mixture as if it were pure cotton. How would they have explained these differences, which were rigidly followed for approximately thirteen hundred years?

There are, of course, exceptions to any such standardization. Yarn is sometimes intentionally made in the reverse of the normal product so that the two may be used together in a single fabric to achieve a subtle contrast. Or the traditional practice may be avoided for a less obvious reason, such as that reported by Harry Tschopik for the Aymara, who will reverse their normal spinning direction when making yarn for a fabric to be used in the rituals of magic.

Another aspect of fabric production too often neglected by observers is warping procedure. There is virtually nothing known about the extent to which this is standardized by the weavers of any one group or within closely related groups. Where warping is done over a frame or supported loom bars, does everyone consistently follow the same movements? What determines the shed to be attached to the heddle or controlled by a shed rod? If there are rules for this, do they apply where warping is done over stakes or pegs? For other than plain weaves, such as twills or heddle-controlled warp patterns, the heddling order in some, if not all, cases is determined at the time of warping. If such products are to

be perfect, far more skill and mental exercise are required than most of us realize. In our own culture, paper and pencil and a standardized procedure for drafting heddle arrangement and subsequent movements solve the problem for any trained weaver and enable one to duplicate another's work. The lack of such aids means that greater concentration is required and one might expect this to be a factor in keeping designs limited in number and in fixing them or maintaining them as "traditional" types.

As an example of what the warping processes can involve consider what we know and can reconstruct of the preparation of warps for the ikated Mexican rebozos. In these the pattern is dyed in the warps before weaving and, although we have excellent detailed data on the process compiled by Mrs. Elsie McDougall, we do not know anything about the mental calculations involved.

An analysis of a very fine rebozo shawl with an average of 305 two-ply cotton warps per inch shows a combination of patterned rows repeated thirty-one times across the full width of the garment. Each of these units have 320 warps divided among thirty-two stripes, half of which are plain, the rest with minute patterns created by resist dyeing. Four of the resist pattern rows are composed of five separately dyed sets of four warps each. Two other rows similarly have four sets of four warps each, while the remaining eight have a simple dot pattern which did not have to be subdivided for dyeing.

The first step in warping for such a fabric is done about two parallel bars, the weaver counting off the exact number of warps needed in each element of each patterned stripe. In the specimen taken as an example, there are 125 five element rows in which the same pattern is applied in four different ways; 124 four element stripes in which another pattern is applied two ways, and 248 of the simple dotted stripes. A total of 5,952 warps have been used for these, all set up at the first stage as a continuous yarn. We do not know if, in counting off the number needed, the weaver concentrates on the total required for all like pattern stripes, or if he works from a mental image of the final product counting in sequence the different numbers needed in the successive stripes.

Once the undyed yarn is so set up, the weaver then selects and groups together, without breaking the yarn at the bars, the warps to be dyed for each element of each pattern. These are picked up from the positions they will have in the finished fabric, the four which will form one part of the intended pattern in a single stripe combined with the corresponding ones wherever that stripe is to be repeated. In our specimen this stage of the process probably results in twenty-three groups of 240 to 248 warps each.

As this is not a description of the ikating process, we can skip the details of the treatment of the grouped warps: the stretching, starching, marking, the placing of the resist bindings, about 22,000 of which were needed for the creation of the pattern in the rebozo mentioned, the dyeing and subsequent steps.

Before the result of all this labor can be put on the loom the weavers must warp up the solid color stripes for separating the patterned rows. This is done the same way as for the patterned warp over parallel bars set at the same distance. Again a continuous yarn is used, the turns counted off to exactly the required number. In the example considered, 3,976 warps were required to form the 497 plain spacer stripes.

Once both this and the warps on which the patterns have been dyed are ready, the two sets are integrated, the pattern elements back in the positions they occupied prior to the grouping for dyeing, but separated so that the plain warp stripes can settle in their final position. Again this is done without breaking the yarn at the turns. Only then is the warp ready to be bound on the loom bars.

If all this seems complex, we can agree that it is. The only point in reviewing the procedure is to show that such warping requires more than skill and patience, that intensive concentration, numerical calculations and perfect memory are equally important. One should remember that such work was and is being done by seemingly poverty-stricken, simple, illiterate folk who make no use of paper and pencil to plan their moves. If we are fully to understand and appreciate the capabilities of such people, then technical procedures like this should be fully investigated. Such data could provide very specific points of reference for comparison. Would, for instance, the marked similarity of certain traditional ikat designs in parts of Indonesia and Mexico have any significance if the technical procedures were markedly different?

Where we do know that such a specialized technique has been transferred from one area to another for the production of a specific item, have all details of the process continued in use? A good example of this which merits study is the presence in Ecuador and northern Peru of the Mexican-type ikated rebozos, probably introduced there in Colonial times. It should be possible to determine the time of introduction, perhaps something of its subsequent diffusion and possible modifications to conform with local practices.

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Guide for questions on Spinning and Weaving, and Notes on Collecting

Fibers used:

Cotton:	If natural shades are available, are these handled identically with the white?
Basts	From stems of plants
&	From leaves of plants
Hard:	From bark of trees
	When are these collected? Is this time related to the plant growth cycle?

Wool & Hair: How collected or sheared? Is there any relation between the age of an animal or the part of the body from which obtained and the ultimate use of the fabric? What about natural color differences and whiteness? Preferences? Use?

Silks: Are wild cocoons used? Communal nests? Spider silk?

Miscellaneous: Sinew

Comment:

This listing simply points out fiber categories which should be expanded in detail before developing questions. For example, if one were gathering data on vicuña wool one might ask if the extremely limited amount of white wool on each animal is kept apart from the rest. This should have been the most highly prized of all wools in pre-Spanish Peru, because it can be dyed with colors which will not register on the natural brown of the rest of the pelt. The same is true for plant fibers; there are questions for specific ones which need not apply to all.

In this list bast and hard fibers are lumped together as there is no need in field recording to differentiate the two classes. Both are structural fibers differing primarily in their function within the plants. Some "hard" fibers can be softer than some basts and vice versa, and their preparation and handling can be quite similar.

It is well to remember that the identification of a plant fiber cannot always be done by the native name nor readily by microscopic examination. Exact results are best made with botanical specimens when these can be collected, preferably in the flowering stage.

Preparation of fibers before spinning:

Fibers require, first, cleaning or freeing from seeds, or with basts, freeing from the surrounding organic matter. With short length fibers like cotton and wool the mass of fiber must be prepared so that the fibers when drawn out will lie roughly parallel to each other.

As there are various ways of preparing each of the different fibers, are alternative methods ever used by the same person for some reason?

(Incidental intelligence: Are cotton seeds ever eaten or utilized?)

Spinning:

Direction of twist:

Record as S (clockwise), or Z (counter-clockwise). (The slant of the midsections of these letters symbolize the direction of the slant of the fibers after spinning.) Do all spinners of a single community or region when working the same fibers spin in the same direction?

Left-handed spinners: do they conform to the group practice?

Are all fibers spun in the same direction? If not, why?

Exceptions to the rule?

Comment:

The spinning process involves three distinct steps: the drafting, i.e., the drawing out and laying together of the requisite amount of fiber with skill required if yarn diameter is to be uniform; the imparting of twist; the reeling, i.e., the storing of the yarn on the spindle shaft. The amount of twist, the number of turns per inch, will vary depending on the desired nature of the final product. Where a very hard or crepe twist is desired, a yarn may be spun a second time. If possible get data on the length of yarn produced in a specific period of continuous spinning. Clocking for 15 minutes might be adequate as longer time would probably involve stopping to prepare fiber, etc.

Adding twist, doubling, tripling:

Many observers have confused spinning with subsequent steps in yarn production. These may involve the use of special spindles which are not used for spinning fibers together and are distinct procedures which should be clearly distinguished.

When doubling or compounding, are two or more yarns reeled together as an initial step, or are the yarns stretched parallel for some distance, then lead over a support to a suspended spindle?

Are different doubling procedures used depending on the intended function of the product?

Spindles:

How many will a good spinner have?

Do they prefer having them about the same weight or length, and if there are differences is there any relationship between this and the size of the yarn produced?

Are the same spindles used for different fibers?

Are the same spindles used in doubling or tripling yarns?

Use of Spindles:

There are many spindle types--some resting in a gourd or cup while rotating--others rotated against the thigh--others suspended in the air while rotating. Very fine, even, good quality cotton yarn cannot be made with a suspended spindle, though coarser cotton yarn can be so produced. The use of the suspended spindle with cotton can imply that the people doing so are or were accustomed to handling some other fiber and are only applying their traditional method to cotton.

Do the spinners use anything on their fingertips, like chalk or clay, to increase friction?

Is any particular time of day preferred for spinning certain fibers? For a fine product the moisture content of the air has definite relationship to the way the fibers handle, so in dry regions some spinners realize that early morning hours when more moisture is present are best.

Warping:

Is the warp yarn stretched around pegs either driven into the ground or fastened to a board?

If so, how many pegs are used and how are these related to ultimate position of the heddle or heddles?

Are patterns planned at this stage?

Is warping done over the loom bars or loom frame, and if so, is the yarn started at the left or right, top or bottom, and is it always done this way?

Are the turns counted off, and if so, how is this counting done? What is the relationship of counting to the final product?

How long does warping take?

Looms:

The many types and many variations fall into two broad categories, depending upon whether they permit the weaver to control automatically the tension of the warp or not. Where one of the loom bars is attached to the weaver's body, as with the back strap, such control is achieved. Very little attention has been given this factor. The movements become automatic and may be barely perceptible, but are integrated with the successive steps in weaving. It might be worth inquiring if beginners find it difficult to master this feature.

Setting up of looms:

Very little data are available on the length of time involved. The method of attachment of the warp to the loom bars is important and varies considerably. The insertion of the heddle lacings or leash cord varies a great deal and can be very time-consuming. With both these, there is a possibility of traditional procedure and of individual preference. What are these?

Where a single heddle is used, is the first loop of the lacing about the outer or the second warp from the edge or selvage? Is this always so? Do they consistently start this lacing from one side or the other?

What are the names of each loom part, the warp, the weft, and the various cords or yarns which function in some specific way?

Weaving:

Does the insertion of the weft follow any rule, i.e., is the first passage of the weft made with the warp which are attached to the heddle raised?

Is the first weft insertion consistently from either the right or the left? If so, why? By all weavers in the same community?

It is difficult to get any precise data on the rate of production. One can clock the time required for the insertion and beating in of a specific number of picks or passages of the weft. This might provide one basis for judging the relative efficiency of various loom types, but individual dexterity and skill will be a big variable.

The production of fabrics where the ends of the warp are uncut and the finished cloth has actually four selvages involves an area of terminal weaving. At one stage it is no longer possible to use the shed rod, i.e., the stock which works in opposition to the heddle, and the weft insertion becomes laborious. In very carefully finished pieces the final passages of the weft must be done with a needle, yet there is very little known of this phase of the work. Although this is essentially limited to Central and South America, products of this type are still made in Luristan and may have other rare occurrence in the Old World.

Does the fabric after removal from the loom undergo any specific treatment before it is ready for use?

Most primitive loom products are apparently ready to be used on completion of weaving, but we need more data on this.

Patterning:

In view of the number of techniques involved in achieving patterns and structural differences it would be foolish to attempt to formulate questions to cover them all. What can be checked is how patterns and designs are created and reproduced. Are traditional ones reproduced from just the mental image or does the weaver copy a finished piece?

In prehistoric Peru some use was made of samplers on which designs and details were worked out in embroidery, later to be copied in different techniques. An unconfirmed report indicates that these are still in use--and they may occur elsewhere.

What is the attitude toward traditional designs, and is their use in any way restricted? Examples involving rank are well known, ones related to supernatural factors less so, and there may be a number of minor but equally significant distinctions. Are these related in any way to the techniques and materials employed?

Dyeing:

Where dyes are obtained from plants, unless the source is well known, botanical flowering samples of the plant should be secured. The local name is no guarantee of specific identification.

What mordants are employed?

Is dyeing of unspun fibers known?

Can colors be closely matched at will, using different lots of the source material for the dye?

Collecting of Specimens:

Too frequently looms are collected with no precaution taken to make sure they will remain in the condition they were when acquired. The best method is to lay the loom on a piece of muslin and fasten all of the movable parts to it. Lacking this, all movable parts should have a cord tied to each end across the warp or fabric. If the weaver is asked to do this, notation should be made of what precisely is done for sometimes such retention cords are a normal feature.

If the price asked for a loom is not obviously excessive, do not bargain too much over the amount. If the price is low, give more than asked for. A loom is not just a set of simple sticks, but represents far more, the labor of preparing the yarn, the work of setting it up and perhaps more important to a good weaver, the working parts have been broken in, acquiring a needed polish through use. A weaver will become accustomed to the feel and weight of the working parts of a loom and it requires some time to readjust to new ones. It might be worth inquiring about this. If they claim it makes no difference you can be sure you are dealing with a poor or indifferent weaver.

In parts of Central America some people are reluctant to sell clothing they are wearing for fear that the buyer will acquire magical power over the former owner. Such people, however, can be persuaded to duplicate the desired specimen given sufficient time and inducement.

Never hesitate to take badly worn or old fabrics in poor condition, if they look interesting from the point of view of technique, design, material, or dyes.

Photographs:

One still photograph of a person working at a loom records only the step in progress at that moment. As the operation of any loom consists of a succession of related movements, a whole series are needed to cover the process. They should show at the least, for plain weave construction, all the movements required to complete the passage of the weft yarn for two successive picks or insertions to the left and to the right. The same naturally applies to a motion picture record.

The foregoing is admittedly inadequate. To investigate fully the spinning and weaving processes, knowledge of weaving technology is needed. Even so there is much that can be recorded by anyone and these questions and comments are offered in the hope that they will be of some guidance in getting more than the most obvious information.

The places where traditional weaving practices still have importance and vitality are rapidly becoming fewer. With the passing of the older weavers now living, much will be lost--so the importance of observation and recording at this time cannot be overstressed.

It is hoped that anyone who uses these notes will report back to the author on how useful they may have been and in what way they might be improved or expanded. Dr. Harold Conklin stated that with one group, among whom weaving was important, an inquiry formulated on these suggestions developed a rapport which might otherwise have been difficult to achieve. Most craftsmen and artists, like the rest of us, appreciate an intelligent interest in what they are trying to do--and spinners and weavers are no exception.