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WRINGING IT DRY: THE CHALLENGE OF PREHISTORIC TEXTILES

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Some time ago I embarked on a "short little project" to find out what I could about Bronze Age Aegean textiles, which I had come to suspect were more elaborate and more important than anyone was giving them credit for. I knew the project could not take very long, and would not take more than maybe ten pages to write up, because virtually nothing in the way of textiles has survived from Greece--even in the Classical period, let alone the prehistoric era. But my father, who was a physicist, had instilled into me a question that changed everything: namely, "(If I can't get at it by the direct route,) **how else** can I get at it?" Fourteen years and 800 pages of "how elses" later, I had more or less wrapped up my "little project"--soon to be published as a fat book.¹ It is the story of what strategies and methods I had to invent or discover, to squeeze out the answers to my original questions, that I have been asked to talk about here.

My project had begun when I noticed a) that some typically Aegean artistic motifs were turning up in Bronze Age Egypt without visible means of transport across the Mediterranean--patterns that looked to me like textile patterns; and b) that the earliest archaic Greek art had sprung up with some clear Mycenaean traits, but with no visible means of transport across more than 400 years. These traits, too, looked to me as if they had their origins in textiles.

Archaeologists and art historians, however, pooh-poohed the idea of fancy cloth. After all, people then could not have known how to make such fancy fabrics: we all know that the Greeks were used to wearing plain "classical" white; that they had just climbed out of a cave, sartorially speaking--like Herakles, running about in nothing but a lion-skin--; in fact, that they barely knew how to weave! So my problem was, could I back up my case? After all, virtually no textiles had survived, and indeed, Greece is one of the very worst places for the survival of ancient textiles, because the climate alternates between very dry and very wet each year.

Most people who work with the history of textiles are used to looking at reasonably large pieces of cloth. But the prehistorian is lucky to get scraps the size of your thumbnail. The reaction of most scholars to such crummy little artifacts is either to toss them on the dump heap, or barely to mention them in a footnote, thinking that there is no information value in such scraps. And as long as you only look at one or two of them, that's true. I found, however, that the information value of these tidbits increases almost endlessly as you widen

the context. It is rather like looking at a pointilliste painting by Van Gogh: if you get up very close, all you see is dots--lots of little dots that don't mean anything. But as you move farther away and get a broader view, you begin to see meaningful patterns in them. In just this way I learned I had to increase the context--increase it geographically, in time-span, and in the scope of the questions.

It occurred to me, for example, that I might at least be able to show whether the requisite **technology** was available that early for fancy textiles. Did they have the necessary raw materials--the fibers, the dyes? Did they have the necessary techniques--spinning? weaving? pattern techniques? Again the paucity of Aegean remains was going to be a problem, but I found I could move outwards to get a better view. That is, I discovered that I could tell what was going on in Greece by watching the ripples of technology and materials spreading from nearby areas over a period of time. If the neighbor to east had something, and suddenly the neighbor to west had it, then probably the people in the middle were not entirely ignorant of it either, unless there were some very special circumstances.

Eventually I had increased the time-span of my research back to the origins of each part of the craft--20,000 years for some of it. The space involved expanded from "Aegean" to "Mediterranean", to the area from Iran to Britain--that is, the entire cultural sphere of influence. Five million square miles and twenty thousand years! But that's what it took to wring out a clear idea of one poorly attested little area.

* * * * *

So this was the problem I faced, and the general solution that I took. To see how these methods worked in more detail, let us start with the raw materials. How could I find out about textile fibers in the prehistoric Aegean? A very few miserable-looking scraps survived from the Late Bronze Age, and analysis showed that they were of plain-weave linen. Was that the end of the road? Couldn't I learn any more? There were so many questions. Was the linen local or imported? Did they use anything else too--like wool or cotton? How else could I get at this?

I found that I could trace the use of linen and flax back to the 7th millennium in Turkey and Palestine. In fact, by mapping every bit of ancient textile I could find in the literature, I could see flax getting domesticated and spreading westward, until by 3000 BC there was clearly extensive use of it **beyond** Greece--and far beyond its natural habitat--in the pile-dwellings of Late Neolithic Switzerland. Obviously, then, flax **had** to have been well known in Greece, which was directly on the route between Anatolia and south central Europe.

What about wool? Didn't they know it, or hasn't it survived? That turned out to be a much tougher question. We know that sheep had been domesticated in the Near East by the 8th millennium BC, and we find sheep bones at Greek and other south European sites soon after. But we find no woollen textiles **anywhere** in the Near East or Europe until the Bronze Age.

Careful investigation of the palaeobiology of sheep indicated that early sheep were not woolly--in fact, they had a hairy coat much like that of a deer. It is possible, however, to trace the gradual development of woolly breeds of sheep, and to say that they existed in Iraq and Iran by 4000 BC. We can also see the spread of (the bones of) a new breed of sheep into Europe after that: the front-line passes through Greece ca. 3500-3000 BC. So by careful mapping we can deduce that wool was available in Greece after that date. In the Late Bronze Age (1600-1200 BC), spotty economic records that have survived show sheep and wool as major industries, and flax as a minor one.

So mapping the wider context has again allowed us to wring out an answer. As my friend and New World textile expert Patty Anawalt says, "When in doubt, map it, chart it, and draw it." This approach is terribly productive, because by doing these things you begin to see the relationships you had missed.

But we can go even farther now, because the archaeology and biology thus combined illuminate and bolster the interpretation of the hard-to-understand economic records. The Mycenaean Linear B tablets give evidence of a major wool industry--once you understand that the huge flocks of male sheep were wethers being kept for their wool, rather than useless animals destined for slaughter at the next feast of the gods. (Incidentally, the striking parallels with medieval English sheep-keeping records helped too in untangling the details of the Mycenaean flock-records, once people recognized what was going on.²) What is more, all this proof of a major wool industry tells us that wool was indeed surviving even worse than linen in those conditions.

I can also say, after chasing all the other textile fibers in similar fashion, that wool and linen were the only ones available in the Bronze Age Aegean. Cotton, silk, and hemp all arrived in the Iron Age, each moving outward from a traceable time and place of domestication. So, from what seemed like almost no remains, we have built up a very solid picture of the basic raw materials.

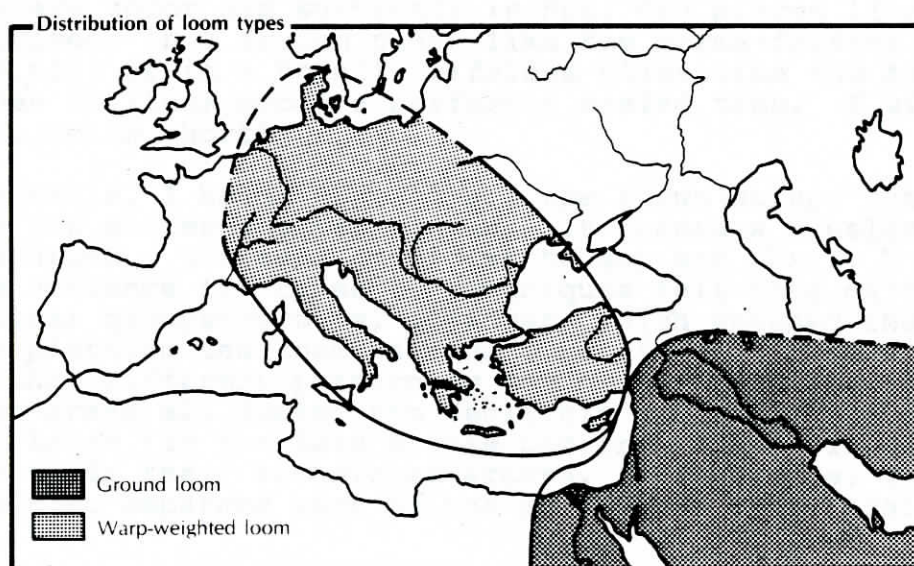
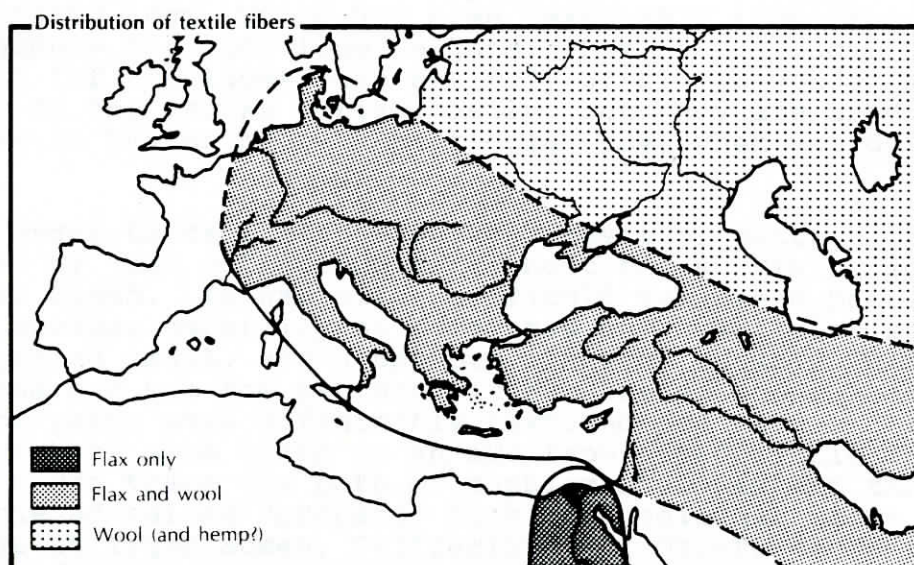
But have we jumped the gun in assuming that flax and wool mean the spinning and weaving of textiles? Archaeologists in Greece find things called "spindle whorls" by the boxful. But are they just beads, as some excavators claim?

No. And we can show that answer by mapping and charting. Robert Liu conducted a world survey of the range of sizes, shapes, and weights for known spindle whorls as opposed to known beads, and of the necessary range of size, shape, and weight for each to do its job.³ The results show clearly that most of the so-called spindle whorls of the Aegean sites **are** in fact whorls. (Note that for this study the useful sciences turned out to be statistics and physics.) We also find a very occasional shaft still stuck in the whorl, which gives added corroboration.

When I began to trace the history of spinning, I got another surprise. It kept going back farther and farther, until I had traced it past the beginning of the Neolithic, ca. 8000 BC, all the way back to 20,000 BC in southern Europe. I didn't quite realize it until I tried doing my own drawings of the figures (remember? "Chart it, map it, and draw it"?), but we actually have a clear representation of strings twisted from fibers, on the Venus-figure from Lespugue in southern France. We also have an actual fragment of twisted cord from the famous cave of Lascaux, ca. 15,000 BC. The cord is 3-ply, and very neatly fashioned of some sort of vegetable fiber.⁴ On the other hand, spindle whorls don't begin until the Neolithic, when people discovered that adding a flywheel to the spindle shaft greatly added to the speed of production. From then on, we can trace the whorls all over the Near East and Europe.

In terms of method, note the usefulness of reproducing the object oneself. This process, precisely **because** it is time-consuming, directs the mind to details otherwise unnoticed. In the case of the Venus-figure, the act of drawing her caused me to notice the tell-tale details of the strings--both the twisting and the fraying. In another case, it wasn't until I tried reproducing some strange details of the surviving Egyptian **fabrics** that I finally understood in detail the Egyptian **paintings** of the processes of spinning and weaving. For example, it had seemed a bit strange that the spinners were not using any kind of distaff; but I hadn't really thought about that lack (a "lack" is the hardest of all details to notice!) until I realized that the thread in the Egyptian linens was spliced at regular, short intervals. That is, the spinners were not using a distaff because they were not drafting the fibers: the thread was pre-formed by splicing and rolled into a ball by the woman shown sitting behind each spinner. There are no scenes of hackling and scutching the flax either; and it was only as I was drawing one of the spinning scenes that I realized that the women were shown softening the flax stems **one by one** with a pair of sticks and stripping the hanks of fiber off with their fingers!

The methods for working on the origin and development of looms turned out to be similar to those for working on spinning, since it involved mainly the tracking of tools and



Maps showing the distribution of textile fibers and loom types in the Late Neolithic and Early Bronze Ages (roughly 4000-2000 BC). Plotted against each other, these two types of data show four major zones of textile development in the ancient world. (From E. Barber, **Prehistoric Textiles**; Princeton University Press, in press.)

occasional representations. Mapping was fairly easy for the warp-weighted loom, which has some reasonably indestructable parts, namely the clay loom-weights. But it was much more difficult for the looms made entirely of simple wooden sticks. Not only do the sticks perish easily, but they are hard to recognize as having had any particular use, when you do find them.

In order to deal with the development of pattern weaving, I started by just collecting data about the surviving scraps of patterned cloth. It was often difficult to assess pattern weaves, because generally no color has survived: most scraps, besides being small, are a uniform black or brown. In rare cases, one can see the pattern without seeing the color: e.g. where the yarns were differently textured (as with a pseudomorph of some cloth on an axe from chalcolithic Susa), or where one can trace the path of supplemental pattern threads (as in the so-called "brocade" from the Neolithic pile-dwellings at Irgenhausen, Switzerland).⁵ Otherwise we are dependent for our knowledge of the use of color upon the few places where color has survived: in hot, dry places like Egypt or the Crimea; in a frozen place like the perma-frosted tombs of the Altai; or in a totally lifeless place like the Austrian salt-mines or (less good) a perfectly sealed tomb. I will return to color shortly.

Meanwhile, I began mapping all the known scraps that gave evidence for patterning techniques. It seemed a hopeless mess when I started. But as I continued to map and chart, I found that the evidence for types of techniques fell into major geographical groups--groups, moreover, which matched the zones found by plotting the looms against the fibers. I began to realize that different patterning techniques were growing up in different areas all during the Neolithic and Early Bronze Ages, and only later (in the Late Bronze and Iron Ages) did people begin to trade their techniques around. Furthermore, I could even begin to separate such things as imports from locally made fabrics.

At this point it became particularly useful to try to reproduce the cloth and techniques myself. It was in trying to copy a bit of Coptic tapestry owned by a friend that I came to understand how to disentangle one of the pharaonic techniques that had been published hastily as "embroidery" but wasn't. (It involved supplemental weft.⁶) In copying an exhaustively published Hallstatt plaid twill I learned a good deal about the weaver's habits, and also how to tell warp from weft even with all four edges torn away.

Where no actual cloth survived, as in the Aegean, I experimented with ways of weaving the ornate cloth represented in the wall-paintings. I found, for instance, that to copy typical Minoan textile patterns I always had to use a

supplemental weft-float weave to get the right effect. (Much later I discovered from the mapping project that this is the only pattern technique attested for early Europe.) While working on the Minoan and Mycenaean frescoes that show costumes, I was in the habit of hand-coloring my own xerox copies, so I could have the colors in my files. The sixth or eighth time I found myself coloring the same border pattern, I began to muse on its frequency, and realized how easy it would be to weave it on the simplest of band-loom. So I tried it, and realized, as I was weaving it, that I had seen the exact same pattern in the pictures of modern Scandinavian women working on the warp-weighted loom. They were using it as their standard pattern for the heading band of the warp for this loom. From this I suddenly understood, from the **ethnographic** parallels, how it was being used in ancient times.

The Egyptian representations of Aegean cloth, too, required several stages of work for me to realize what was going on. Again, having once noticed that these representations occur, I began to collect the drawings and to copy their colors onto my xeroxes. (In this case, they were mostly published in black and white with verbal descriptions of color, and I wanted to be able to visualize them.) As I worked, I began to notice that I was using only red, white, and blue for the Aegean cloth that was represented. Why no yellow or green, which were colors used freely by the Egyptian artists elsewhere?

To understand this, we need to go back and discuss the problem of ancient color. Color, as we have said, has survived only in limited places. Since we are seldom willing to destroy the meagre remains to do analysis (and even then our tests are often indeterminate), we have very little direct information about what dyes were used on the colored textiles that we possess. The newest methods, such as chromatography and spectography, use up less cloth than the old methods, and are more accurate; so we are moving in the right direction. But we still know almost nothing as yet. So how else can we get at the information about ancient dyes?

I made a pincer attack. On the one side, I asked what dye-plants (and animals) were native to where, and when and where they spread. In this work, as with fibers, I turned to the palaeobiology for its evidence, and also to the **linguistics**, since the words have survived better than the artifacts. (Linguistics was especially helpful in tracking woad, weld, and safflower.) Note that neither the existence of the dye-plant locally nor the antiquity of the words proves that these plants were being used for **textiles**, but they do prove both availability and human awareness--**sine qua non**.

I also attacked from the other side, by asking what colors are known to have been used for ancient textiles; and then

tried to match up in the middle, with likely sources for likely colors. To find out what colors were used for textiles, I gathered data a) from the surviving fragments, b) from any pertinent economic records that had survived, c) from "scientific" treatises of the time (the Mesopotamians and Egyptians have actually left us a few dye-recipes); d) from "literary" records (e.g. Homer mentions Helen spinning "sea-purple wool"; and we know from Roman literature of the yellow robes of the Vestal Virgins), and e) from painted representations.

Now we're back to our Egyptian representations of Aegean clothing, and the fact that this clothing was **seen by the Egyptians** as only red, white, and blue. As it happens, Minoan frescoes show no green clothing, so that part matches; but Minoan frescoes **do** show lots of yellow clothing. What's going on? Was the Minoan yellow dye not color-fast, so that it didn't make the trip to Egypt well? Somehow I didn't like that solution.

Eventually I saw a publication of a newly discovered fresco from Thera--a fresco of young Minoan women picking saffron as part of a specifically women's ritual, evidently to do with puberty, and offering their saffron to a goddess. It occurred to me that perhaps yellow cloth was sacred specifically to **marriageable women!** Compare the later Greek tradition of brides and virgins wearing yellow. Furthermore, the article about the fresco mentioned that among modern Greek peasant women, saffron is considered a specific for menstrual ills! (Note again the usefulness of ethnographic parallels.) So apparently yellow **was** sacred to women and their special goddess(es)--and men apparently didn't wear yellow (unless perhaps in the service of the goddess, which seems now to be the only time that we see the men wearing it). From all of this we have a much more cogent, not to say interesting, reason why the (male) ambassadors to the Egyptian court were seen to be wearing only red, white, and blue.

More corroboration of this hypothesis came still later, when I happened to notice some Cretan pottery of about 1000 BC. It caught my eye because it contained motifs that I had been tracing as Minoan rug motifs among the Egyptian frescoes from 2000 to 1400 BC. When I looked up the color plates of this pottery, I discovered it was done exclusively in a stunning red-white-and-blue color scheme, unique in Aegean pottery.

Having isolated the peculiarity of the red-white-and-blue color scheme, I was now struck by a single red-white-and-blue ceiling pattern in one of the Egyptian tombs that had other evidence of Aegean inspiration, the tomb of one Menkheperaseneb. Upon closer inspection it proved to have as its border the same peculiar motif as a handsome linen belt from about 1000 BC found recently in Greece!

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In this way, over and over, the research has fed itself for years, one approach providing just the data for another approach to work, and so on. The kinds of data obtained include the nature and distribution of the textiles themselves, the origin and development of the crafts involved and the tools for working them, artistic information on preferred textile patterns and techniques (even in the absence of actually surviving textiles), linguistic information of various sorts, economic information (especially concerning women's work), and, as we just said, information on how to interpret other information. The sciences drawn on include biology, chemistry, physics, statistics, linguistics, and ethnology.

The kinds of methods used have included collecting known examples of textiles and everything related to them (e.g. tools, raw materials, representations, language terms); examining every conceivable sort of context--archaeological, geographic, physico-chemical, biological, historical, literary, economic, linguistic; obtaining technical and statistical analyses of surviving artifacts of any of these categories; mapping and charting the artifacts and related data in space and time (that is, looking for patterns in the many "dots"); and reproducing examples (by drawing, reweaving, or otherwise manufacturing--closer knowledge of this sort never failed to bring in surprises).

In short, I was always having to ask, "How else can I get at it?" When you have next to nothing to go on, you have to wring **everything** dry of its information.

NOTES

¹All of this material, and all that follows that is not specifically footnoted, can be found in detail in: E.J.W. Barber, **Prehistoric Textiles**. Princeton University Press; in press, expected Fall 1989. Most of the objects discussed here are illustrated there also.

²Most of this work was done by John Killen: see in particular J.T. Killen, "The Wool Industry of Crete in the Late Bronze Age" in **Annual of the British School at Athens** 59 (1964) 1-15.

³R.K. Liu, "Spindle Whorls, Part I: Some Comments and Speculations" in **The Bead Journal** 3 (1978) 87-103.

⁴A. Glory, "Débris de corde paléolithique à la Grotte de Lascaux" in **Mémoires de la Société Préhistorique Française** 5 (1959) 135-69.

⁵Z. Lacaisne, "Note sur les tissus recouvrant des haches de cuivre" in **Mémoires de la Délégation en Perse** 13 (1912) 163-4. Emil Vogt, **Geflechte und Gewebe der Steinzeit**. Basel, 1937.

⁶E.J.W. Barber, "New Kingdom Egyptian Textiles: Embroidery vs. Weaving" in **American Journal of Archaeology** 86 (1982) 442-5.

⁷Nanno Marinatos, **Art and Religion in Thera**. Athens, 1984.