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## THE ART OF WEAVING IN PRE-HISTORIC TIMES

by EUG. PITTARD, Professor at Geneva University and Director of the Ethnological Museum Geneva

It was in Switzerland that was gleaned the first information obtained in Europe concerning the art of weaving in pre-historic times. The making of cloth dates back to the Stone Age.

The text-books tell us that lake-dwellers' villages were first discovered during the winter months of 1853. In that year, the waters of the Lake of Zurich fell to an exceptionally low level and, at Obermeilen, innumerable piles were found in the bed of the Lake ; among these were gathered stags' horns and bone débris, pottery, flint and polished stone implements.

In reality, the existence of these and similar objects had already twice been brought to public notice ; first in 1829, when the little lake port of Obermeilen was being

deepened and, the second time, in 1843-1844, at Männedorf, another township on the shores of the Lake of Zurich, again when work was being carried on in the port. In each case, stone objects, implements and stags' horns had been found, but no one realized what these deposits signified.

It is to an Obermeilen schoolmaster, Johannes Aepli, that we owe the revelation made in 1853 and which became a scientific and most prodigious discovery ; to Ferdinand Keller of the Zurich Museum must be attributed the scientific interpretation of Aepli's find.

When Ferdinand Keller perceived that these objects were a record of a relatively advanced and hitherto unsuspected civilization, the news fell like a thunder-bolt

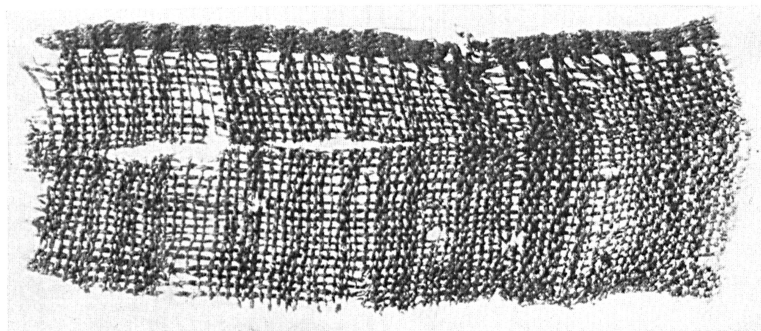


Fig. 1 Linen cloth (beginning edge) found in the Robenhausen Lake Settlement (Zurich) : Swiss National Museum (natural size).

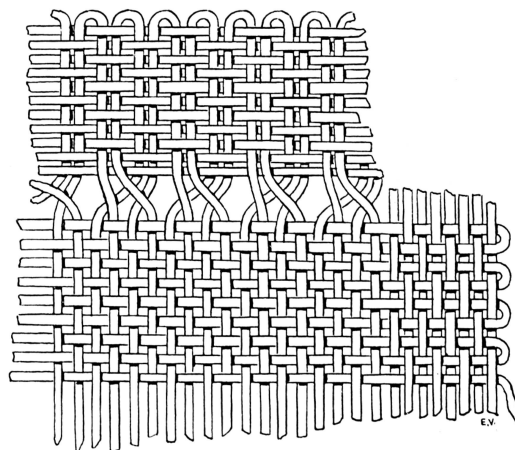


Fig. 2 Pattern at beginning of weave and selvage of specimen illustrated in Fig. 1.

in the scientific world. As soon as the sensational news was published, archaeologists set to work on all the lakes of the Swiss Plateau. Very soon other remarkable discoveries were made.

Among the primitive dwelling-places which were destined to become famous in the chronicle of pre-historic times, Robenhausen, a village on the shores of the Lake of Pfäeffikon, was particularly predominant and has, in fact, lent its name to the Swiss lake civilization or so-called Robenhausian culture. It was here that were found small fragments of cloth, specimens of which are now deposited in European and American museums. The Neolithic Age (or « New Stone » Age, when polished stone without copper was used) can be considered as a period when one of the greatest social revolutions in history took place. Before this, Man had been a hunter for millions of years ; now came a crisis which followed the great climatic changes in Europe. Hunting gave way to herding and cultivation. Nomadic clans which had wandered over probably restricted regions, now began to settle down to community living. Early cultivators dug the soil and sowed cereals. From that time on, the communities grew and became an expression of a much broader mode of living. A moral code, born of the social restrictions and obligations inherent in all human agglomerations, gradually became law.

To whom do we owe these transformations which modified humanity so profoundly? Present knowledge seems to show that this development is due to migratory movements of intruders who thrust their way

through Eastern Europe from the Near East, where cereals (wheat, barley, millet) were indigeneous and which, in Europe, became the major element of human diet. It is to these invaders too that we owe the art of domesticating animals, first the dog — which made its appearance in the preceding Age, the mesolithic — then the ox, the sheep, goat and pig.

The newcomers also brought the art of cultivating flax, of using the wool of sheep and of weaving the first fabrics and cloth known in Europe. Until their coming, the primitive races of Europe had employed only the skins of animals to protect their bodies against the cold, but we do not know exactly how these skins were used. Perhaps they made real garments from the furs ; it is certain that fragments of long bones have been found which carefully prepared and sharpened and obviously used as needles. The thread was obtained from the tendons of animals. Certain unidentified objects have also been found and are considered to have been employed as buttons.

Neolithic Man may therefore have been the first tailor, the first dressmaker. However, we cannot allow our imagination to roam too far afield, because no trace of these perishable furs have been found in the cave-dwellings of pre-historic man.

It was a lucky chance for historians of dress that men took to the lakes and built their dwellings and villages there. None of the perishable objects which have been found in a relatively good state of preservation in the mud of lake-beds could have survived had-they accu-

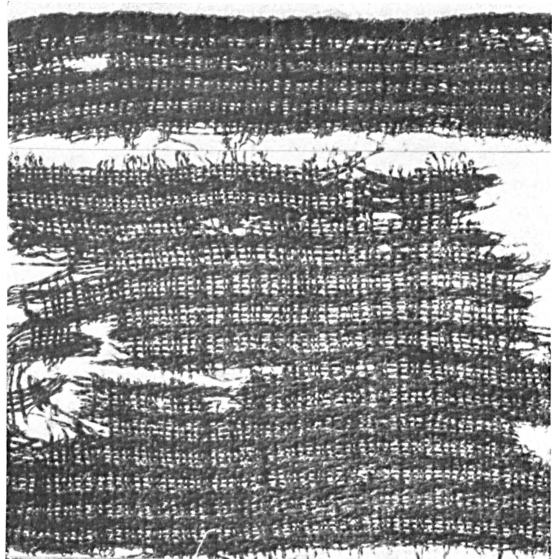


Fig. 3 Right side of a piece of striped cloth with initial selvedge. Specimen found at Robenhausen (Zurich). Swiss National Museum (natural size).

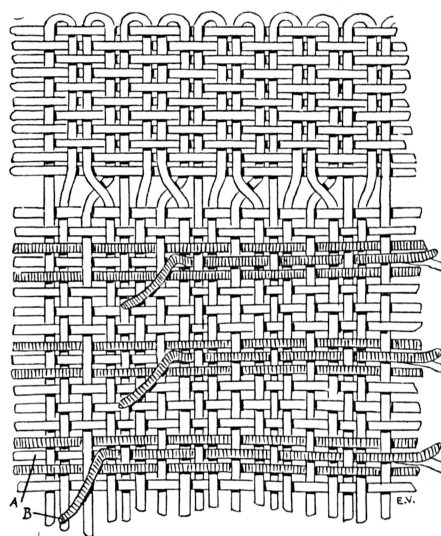


Fig. 4 Pattern of weave in cloth illustrated in Fig. 3.

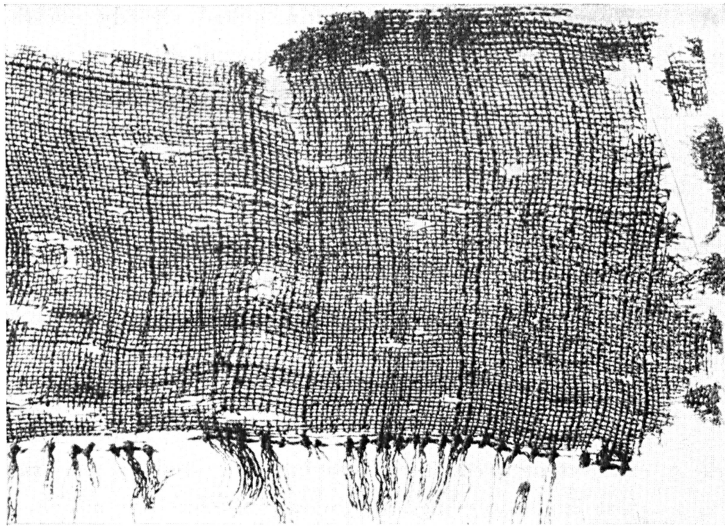


Fig. 5 Fine linen cloth with fringes and showing traces of lateral selvedge. From Robenhausen. Swiss National Museum (natural size).

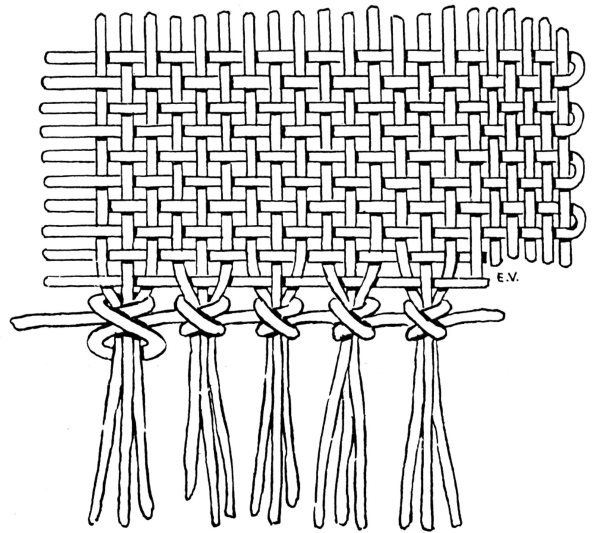


Fig. 6 Pattern of weave: specimen illustrated in Fig. 5.

mulated on dry land. All organic substances such as linen and wool disintegrate very quickly under the influence of air, rain or damp. Protected against the action of air by a layer of mud and the more or less deep mass of lake water, various objects have come down to us after thousands of years, despite their perishable nature. It is in this way that we have been able to learn what foods the Swiss lake-dwellers cultivated: wild fruit and seeds which they gathered have been found.

But — what is of greater interest to us here — traces of primeval woven cloth have also been found. Swiss lakes, at least those which were suitable for the construction of settlements, were inhabited in the Neolithic and Bronze Ages. In the Iron Age, not so very far distant in time, men built their villages on land. What were the fibres used by Neolithic Man for spinning and weaving?

Cotton was probably not used so early even in Asia where the plant is indigeneous; nor could silk have been used, even though the utilization of this fibre was known in China, they say, in about 2 000 B. C., although it remained unknown in Europe for many centuries. (According to Pliny, the Romans spent large fortunes in obtaining silk from China). There only remains two possible textile fibres: flax and wool.

The lake settlement of Robenhausen was discovered in 1858. In 1861, Messikommer found the first traces of woven cloth deep in the mud of the lake bed. This cloth is woven from flax fibres. Later, in the course of exploration, balls of thread were discovered, and these

testify to a highly developed art of spinning. Specimens of this primitive cloth also show that several methods of weaving were employed by the lake-dwellers. (H. Messikommer: « Die Pfahlbauten von Robenhausen », Zurich 1913.)

Wool does not seem to have been widely used in the Neolithic Age. Sheep were probably not kept in large herds at that time and it is also possible that mud does not preserve wool so well as it does linen. Robenhausen was not the only primitive settlement in which archaeologists have found specimens of ancient cloth. When the bed of the River Aar was being straightened, the level of the Plateau lakes — Neuchâtel, Biemme and Morat — fell considerably and several lake villages were partly exposed. Cloth was also found among the remains. Many of the greatest museums in the world today possess fragments of this pre-historic cloth the Swiss Lakes have preserved through the centuries.

\* \* \*

It would be most interesting to know where the art of weaving was first invented. We shall doubtless never know, chiefly because of the perishable nature of the material employed (again it must be stressed that the specimens extant owe their preservation to the mud on the lake beds). Is it to Asia that we owe this craft, to the continent where cotton, flax, silk and wool are abundant? To Egypt?...

It is of course evident that wherever the raw material is to be found, almost every race in the world has invented a method of weaving, this craft being preceded by plaiting which seems to have been its prototype. We do not know exactly what these ancient looms were like. By comparison with those used by surviving primitive races today, we can reconstruct these very simple apparatuses, however, and also the methods used. In the mud of lake settlements have been found certain implements used to gather the flax : a wooden or flint blade for cutting the plant (today it is torn from the earth) ; other implements were used to loosen the fibres. The filaments were carded with sharpened animal bones



Fig. 7 Reconstruction of a polychrome, sewn cloth from the Irgenhausen Lake Settlement (Zurich). Woven from left to right.

tied together or, perhaps, with a comb. How did these primitive people wind the thread on the spindle? Probably by hand at first, as do still primitive races of the modern world ; some natives even now wind their thread on their thigh. The bobbin seems to have been quite an early invention. In the Robenhausian culture, the spindles were made from small pebbles, rounded, with a small hole in the centre through which the stem of the spindle was passed. In later lake-dwellings of the Bronze Age, the bobbins are found to be made of ceramic and, in some cases, daintily decorated with geometrically carved designs.

Weavers in those remote times had already evolved several methods of work ; a number of different weaves have been traced — linen, repps, fringes.

A very interesting study entitled « Geflechte und Geweben der Steinzeit » has been written by Professor Emil Vogt of Zurich on the craft of weaving in the Neolithic Age and the various methods invented at that period. Very detailed information concerning these different techniques is further explained by illustrations. In the February 1946 number of the « Ciba Review » an article by the same author gives an invaluable summary of all that is known today on the subject of pre-historic weaving. The study of this subject is not confined to Switzerland but has also been developed in certain countries especially favoured as regards means of research : Austria, Denmark, Sweden.<sup>1</sup> Although we have a fairly wide knowledge of the different aspects of pre-historic cloth, it is impossible, even with the most vivid imagination, to reconstruct the garments worn in the Neolithic Age. The fragments of cloth found in Switzerland are too small to allow for this. Professor Vogt has announced the discovery of a dress accessory found at Robenhausen : the fragment is a primitive pocket, a cloth of fine weave on a more coarsely woven cloth.

More abundant information has been obtained (thanks to finds made in Denmark) concerning the cloths used in the later Bronze Age and their various applications. Discoveries made in Bronze Age lake-dwellings show that flax was relatively less used then than it had been in the Neolithic Age. It was replaced by wool. That, at least, is what seems to obtain from present data. At this period, the breeding of sheep, relatively restricted during the preceding Age, was intensified ; large flocks were now kept and yielded their wool. Perhaps, too, our ancestors had discovered that sheep-shearing calls for less work than the many tiring operations of flax growing, or the preliminary preparation of this vegetable fibre for spinning.

Several specimens, not only of cloth, but of garments of the Bronze Age have been found in Northern Europe. It is not known however whether, in the Robenhausen culture, garments were cut in the same fashion as in the North of the Continent. One day, perhaps, some fortunate discovery will enable us to obtain more explicit data concerning the garb of our pre-historic ancestors. Time only can tell...

<sup>1</sup> Professor Vogt has kindly permitted us to reproduce here a few illustrations of specimens he has studied personally, together with details concerning the weaves. We wish to express our sincere thanks for this spirit of scientific co-operation.