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OLD CRAFTS

ethnography
people's architecture
weaving
pottery
supeljka making

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project

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"Natura Balkanika", together with partner organization Foundation "PhD. Stamen Grigorov" based in Tran, Republic of Bulgaria, is implementing this project in the period 2009-2010 in two mentioned municipalities.

The Study aims at all parties dealing with or aspiring to deal with old crafts that still exist in the municipalities of Tran and Dimitrovgrad: construction of old houses, weaving, pottery and making traditional wooden music instruments. It was composed throughout the courses for these crafts held in the project workshops in Gulenovci village, Dimitrovgrad municipality, in June 2010.

ETHNOGRAPHY

ETNOGRAPHIC STUDY ON TRADITIONAL LIFE STYLE AND CRAFTS IN TRN AND CARIBROD AREA

Everyday life and national customs of the citizens of Trn area do not seem, at first glance, any different from the customs in other parts of Bulgaria. However, when a closer look is taken, one may notice a lot of specificities in everyday life and customs of this area. Firstly, ancient customs, which have been resisting modern foreign influences for ages, are kept. Apart from that, the citizens of Znepolje and Kraiste have been adding to each manifestation of life, each custom something personal, typical only of the citizens of this region. The local specificities are similar to those in Burel, Derekul, Zabrdje and Visok in Caribrod area in Serbia.

HOUSE

Many villages are scattered in Znepolje and on the slopes of hills in Kraiste. Village houses on vast mountain pastures are very picturesque. Although rare, there are some original old houses preserved in some village parts. These buildings are examples of the type and character of hospitable "ize" (house) which existed before the Liberation. Hospitality is a characteristic trait of a Trn and Caribrod family. Every guest, whether familiar or not, was welcome in their modest home, where they would be hosted warmly.

Old houses from both sides of border were usually made of stone and wood intertwining, smeared over by mud and covered with straw and reed, and later recovered by hollow tile. There were usually two rooms in the house, a big room and a small storage room. These small houses were inhabited by families which had many members and were very patriarchal.

The big room is the main room and often elongated. It is usually entered directly from outside or from a small hall, which was used only as a passage. There was a door which led to the small room - the store room. It was a small room for keeping wooden arks with clothes, covers, scarf, and cloth, all made by women. Some houses had "zemnitce" (cellars), where casks with cabbage and prickles and barrels with meat and cheese were held.

The hearth with trammel for cooking meals was either in the corner or in the middle of the big room. The hearth was also used for heating, but in ancient times for lightning as well. On one side, above the hearth, there were shelves to store kitchenware and pitchers. A bed was placed on the earth floor, usually made of straw, covered by woven or wool rugs. Pillows were as long as the bed was wide, usually made of brindled woollen cloth, made as a "introducing" rug and were staffed with rye straw. All members of the family slept in the bed and used homemade rugs as covers. There were numerous small and big hooks around the chimney for hanging the ropes of corn, pepper, onion, bacon and pork ribs as each family was fattening a pig for winter. In the corner, next to the door, the pitchers were usually placed. They were being produced from old times. Trn is famous for various clay dishes called "vrcve" and "vrcvice" which people used for storing cheese, peppers and butter. The country folk usually used a small wooden chair with three legs which they maid themselves. There was also a wooden bowl "tekneto" for making bread, frying pans, iron plates for baking meat and other household items. The housewives were known for their cleanliness and ability to maintain

their modest household neat. Well made rugs, small multicoloured curtains and curtains on the shelves create warm atmosphere in a clean home.

Yard

A hardworking and industrious housewife took care, not only of the home interior, but of the yard and small flower-garden in it. The yard was usually separated with a high stone fence in which there was a wooden gate, called porta. The yard was separated from the garden by a lattice fence. The garden was facing street, and the yard was behind the house. In every yard there were piles of logs, stables, hen-houses and other facilities. Early in autumn, before a severe winter, the villagers hurried to prepare logs for heating, making a big pile of logs in the yard called "drvnik" (a pile of logs necessary for winter). A thick wood on which the logs were cut was called "truplo" (body).

In every village there was a special place for grain, wheat, potatoes and beans, called "klet". Klet is a room with wood dividers called "presede", which were used in autumn for storing corn, potatoes, and beans; "Let it be fruitful, let the barrels be full, barns filled with grain and pigsties with pigs!"- this is how Trn villagers blessed during the holidays.

Domestic animals were life companions of citizens. In each yard there was some cattle, sheep, pigs, goats, hens, dogs etc. Cattle was kept in hovels (hangars) which were in the same yard next to the house, or outside it. In case the hovels were outside the village, older villagers stayed there during winter to take look after the cattle.

Nutrition

The main food in this area were bread, made by the house wife and baked as "provan" (bannock) in "crepna" (clay container), potatoes, beans, meat, butter, milk and cheese. Tasty beans, cooked in a "grnac" or ash covered bread, baked in ember, were favourite food of citizens. Necessary vegetable was produced in small gardens, or near the water. The gardens in the yards were managed with taste and skills of women who planted together with vegetables, but in separate rows and surrounded by box wood, different garden flowers. Nice scent of basil and geranium spread through village yards. On many fences, between stones, geranium was blossoming and gave them picturesque look.

Water for drinking and other purposes was taken by villagers from the springs, wells by pouring in the pitchers and other clay dishes. Girls and young women usually went for water. For girls and boys these were short encounters by the water where brindled goblets were filled in, bouquets of flowers were stolen and love messages exchanged. It was usual that older Trn women remembered, not rarely with a sigh, the pleasant duty was of bringing water in the evening, before dusk.

In winter the households were snowbound. Besides the duty to provide logs, men had to provide food for numerous families as well. When the first snow covers forest paths, the swine slaughtering would start. During the swine slaughtering the customs expressing mutual help, friendship and hospitality developed. It is an old custom to give meat to cousins and neighbours as a sign of respect. To those who, for some reason, did not feed pigs that year, bigger pieces of meat were given, so that they were provided for winter.

CRAFTS

The advancement of cattle breeding in Trn and Caribrod created conditions for the development of domestic crafts. The processing of wool from thousands of sheep scattered over the mountain pastures was the most prosperous.

Weaving

Wool was main raw material from which the experienced citizens produced both female and male clothes, rugs and other necessities for village household. Wool was processed in the simplest possible way and all activities during the production of rugs and warm clothes were done manually. After the wool was rinsed, it was "straightening out", as the citizens say, in order to get the desired product for processing. The combing of the wool was done manually with a comb, which was also handmade. Depending on the quality and purpose, the wool was combed with two types of combs, one for good and long hair, and the other for shorter hair. For the preparation of best wool used for making thin yarn, two combs with prongs in the end were used, so that the thread of wool went through both combs, first through one and then the other. This is how the longest threads are chosen for making a "tuft". The second type of combing is the preparation of wool for weaving. It is the process of preparing shorter and tougher threads, left after the first combing. This comb is a wooden log or board with two or more rows of prongs. In the past, each family had a comb for wool which was later used for combing only small quantities of wool, since new devices for combing the wool appeared.

The weaving was also done manually. Women were spinning the ancient wooden spindle tirelessly all night long, especially during long autumn and winter days, when there was not so much field work. Thin and even yarn was necessary for the warp of rugs, soft sock and waistcoats. At the time women were weaving wool from "hurkas" (distaff) to which they were binding threads. The very weaving was done on the distaff made by the villagers themselves and which were much more primitive then nowadays. Thicker yarn was made without hurka (from the hand). From thus made thick or thin yarn, depending on the use, all necessary cloth, rugs, socks, sweaters and gloves were made. Domestic cloth production was not intended for sale, but for satiating own needs, which made this craft very important. Industrious weaver would keep spindle in hands for months and worked on rugs which came out of their hands with marvellous patterns and successfully matched colours.

Domestic loom for making cloth and rugs is made of beam for winding warp, heddle and frame through which the threads pass and second beam for winding finished cloth. There are


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auxiliary tools apart from loom: big wood for keeping beam and warp when turning, shuttle for putting the treads through the warp threads, beam for winding the woof threads etc. In order to start weaving warp and woof are necessary. The woof is thin yarn, firstly steamed to soften, and then it is warped. Warping was usually done in the yard, in company of several women. The warping depended on the yarn and the length of cloth. In old times the measure for length was elbow, and that is why it is usually said "I warped it on 45-50 elbows". After warping there is winding on the wooden beam, starting with a shed and ending with a tail. Warping, winding and introduction are preparatory phases of weaving. Thus prepared loom is ready for work. The fore-weaving and up-weaving is done by thicker yarn, different in colour and thickness, depending on the needs. The fore-weaving was done by shuttle in which there was a stick with manually winded yarn. The yarn is put through the warp threads with the shuttle. The sticks were usually made of elder-berry, and were of the appropriate length to get into the shuttle. Depending on the number of threads to be used, the cloth was divided into two types: quadruple and double. Simple cloth and weaving was done on two threads, and aba and tougher cloth for male clothes and rugs were made on four threads. There was a great variety in threading. The skills of the weaver to combine colours and shapes were especially showing when making patterns. The rugs with magnificent patterns are the pride of weaver who wove into them their love towards their nearest and dearest. Sewing was a usual duty for women, because no one used to buy rugs and clothes, they were homemade. Apart from wool rugs, there were also rugs made of hemp and cloth made of hemp for making male shirts. The processing of hemp for life necessities was inseparable part of weaving activities.

Hemp was giving good yield in Trn and Caribrod area. The yarn for cloth and rugs was made of hemp. The way of processing the green stem of hemp into a nice thread was very simple. After harvesting, the hemp was being tied into small bunches and soaked in water until it softened and became suitable for processing. After softening it was rinsed in clean water and dried in the yard. Dried bunches were strongly beaten by a wood in order to separate single threads from the stem. Combing of hemp was done with wooden combs, the same as the combing of wool. The threads of thus prepared hemp for yarn were called "povesma". From processed hemp, women were making warp or woof for cloth, rugs, shirts and underwear.

Knitting

Apart from weaving, the women were also knitting. Hand knitting was also developed, depending on the needs. From the wool yarn, called "mane", socks, waistcoats, sweaters and other garments were knitted. Women were wearing nice hand-knitted wool socks. Knitted


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products in this area were characterized by a huge variety of models and patterns called "lastici". Women were very skilled in choosing colours and patterns for knitting male and female socks. Hand knitting improved over time. The women started making lace, tablecloth, covers, curtains and other products which contributed to the hospitality and comfort of the house. Trn girls used to weave hundreds elbows of cloth, aba and rugs and knit different items for house. Female national costume shows the skills and workmanship of women.

Embroidery

Embroidery was used from old times. Trn women invested their talent and sense of beauty in different embroidery on clothes, shirts and "litaci".

Sewing

During long winter nights in small dark houses, illuminated only by a lit fireplace, the sound of spindle and loom blended with the songs and teasing of the young. It was with love and skill that women produced material for clothes. The sewing of clothes was done by men so called terzije. Men sewed male clothes manually - "beletine", waistcoats etc. As they did not have their own workshops, they went from village to village, from house to house, and would stay in one house while there was work to do. When they finished work in one house they would stay in another. Terzijas sewed clothes in the simplest possible way and it all had the same cut. This can be seen from preserved ancient clothes.

Pottery

Pottery was, even from ancient time, together with mining an important part of the economic activities of one part of villagers. The same as in other parts of Bulgaria and Serbia, pottery in this area is one of the oldest crafts, though clay dishes from Thracian period and from the beginning of Slavs' migrations are scarce since there are no archaeological excavations. It can be said with certainty that pottery existed in the far past, and the craftsmen potters who had several centuries of experience at their disposal, transferred their skills to the next generation. On one hand, this can be testified by different shapes of clay objects much alike the forms of antique and Thracian and Slavic products. On the other hand, the pottery developed in this area thanks to quality red clay, which abounds in the area of village Businci, eight kilometres south of Trn. Apart from that, as mining was prospering, Trn potters had at their disposal lead without which the improvement of pottery would be impossible. The production of lead


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helped the citizens to establish pottery as one of the main activities even from the ancient times. The pottery production prospered so much in the village Businci that it became one of the biggest pottery centres in Bulgaria. Other villages from Trn region provided pottery from Businci. Although the experience of Businci potters is almost a millennium old, the preserved products are from 18th and 19th century, when this pottery blossomed exceptionally.

The potters worked manually and on the wheel. Different household items were produced from quality red clay that was found in the village surroundings. As the expensive metal objects were bought only by municipalities, churches and monasteries, Businci potters produced cheap objects for the needs of villagers who were satisfied with simple shapes which ensured the objects to be functional. Simple Businci pottery, aimed at everyday use, expresses the self-taught sense of beauty. Craftsmen-potters succeeded to incorporate artistic talent in their work in various ways and by using different techniques. Many pots were made of fired clay (so called terracotta), the others were soaked in purified and filtered engobe, which is usually white and makes the dish more elegant. The most beautiful and versatile products are glazed and are more solid and with more effective pattern. Glazed were mainly dining dishes (bowls, jugs and pans), different household pots and cult objects. Furnaces, stove pipes, weather vanes, stoves for making brandy etc. were pretty rough. More beautiful and complex was the decoration on the wedding dishes: beakers, wine dishes, food dishes and toys. They were decorated with geometrical and sometimes floral ornaments. Favourite colours of Businci potters are red and yellow – the colours of fire and the Sun. Warm green shades were often used as well. The products of Businci potters were present in every Bulgarian home. They were characterized by high quality and durability which is why they were demanded and famous far from Trn area. At the end of 18th century, Businci potters were making more than 100 different types of objects and there were more than 300 workshops in the village. The whole families were in the business. Father and older brother were main craftsmen and they were giving their experience and skills to younger, and it was very often that wives took part and were the best assistants to their husbands.

Craftsmen potters were connected. Although there was no constitution or codex of potters' guild, they were united in one association in line with the old craft tradition. Apprentices and assistants were subordinated to the craftsmen and everybody knew their obligations and tasks. As well as masons' craft in Trn area, the potters were also connected by working far from home. Businci potters were bringing far from Trn not only their products, but also their craftsmanship, bringing them to towns: Samokov, Custendil etc. It is characteristic that they would leave Businci in summer and come back home in October. They used to travel in


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groups on mules and horses, which were carrying tools and material. Their farewell and welcome were accompanied by special ceremonies and celebrations. During their travelling the potters spread their knowledge but also gained experiences which they used in their production. The connection between potters from different places is testified by an inscription on an icon in St. Nicola's church in Businci, on which there is a stamp of St. Spiridon guild. It was a present from craftsmen who worked in Nevrokop and it was dedicated to craftsman Sergej Georgijevic. Businci craftsmen used to sell their products in the markets in near and far away towns, in Breznik, Pernik, Vakarel, Ihtiman, Sogia and Vraca. Businci pottery was bought on fares in Uzindzov and Tatar Pazardzik, where merchants from whole Turkish empire came, as well as from European and Asian countries.

After the liberation the pottery declined in Businci because of the industrial production. In 1930 there were 120 potters in the village and later this number decreased gradually. The use of pottery reduced which affected long and positive experience of Businci craftsmen which is today again examined in order to enrich contemporary artistic forms with ancient original and simple decorations.

NATIONAL COSTUME

The national costume of Trn was preserved even in the time of Liberation. Certainly, in Trn, as well as in other parts of Bulgaria, industrial textile and simplified town clothes gradually came into use instead of domestic material and complicated national costume. Nowadays, national costume is almost disappearing. Only elderly women are wearing national costume. The changes of modern life have sent the traditional Trn and Caribrod costume to museums. The female costume is very specific, since the embroidery is very similar to the embroidery from the oldest times.

Female costume

The oldest preserved Trn clothes do not have crimpled and wide "sukmans" (sleeveless dress) like in other parts of Bulgaria, but simpler cut with tendency to follow the body. The sense of beauty of Trn and Caribrod women has roots in the natural beauty of this area. The old female litak (sleeveless dress) was made of two whole even parts - so called front and back part with two side parts (klisce) inserted under arms in order to give width to the skirt. The front part was cut in the middle so that the head could go into the rectangle décolleté which was called "pazuk" by women. The back part was straight. Female clothes was sleeveless, the same as "litak" was later.


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The old litak or sukman was decorated with embroidery on the armpit and bottom rims. This embroidery was first done by red, yellow, green and blue wool yarn by making seams and figures according to personal taste, and later silk was used. Thus made litak was winter clothes, made of aba or "bala" as it is called in this area. Together with old sukman, "alavica" or "plavenica' were worn, which were named after the yarns they were embroidered with. These were "rize" or "shirts" made of linen or domestic cotton cloth and they had the same cut as sukman with the only difference that they had long sleeves. Alavicas were shirts decorated with red colours on the armpit and bottom rims. The sleeves were decorated with special figures. Nice brindled aprons were an integral part of female clothes and were worn with litak. This kind of national costume was considered to be inherited from Thrace. Another piece characteristic of national costume is "tkanica'', a belt woven from differently coloured yarns. It was four fingers wide, and long enough to go around waist several times. Elderly women used to wear brindled wool socks and footwear made of pig's skin.

Female national costume made of linen and cotton domestic cloth for warmer days was very characteristic. It didn't look different from old sukmans and it was worn with rich embroidered shirt. Although very comfortable for summer, these clothes disappeared and gave place to litak which was worn both in winter and summer, but differently from old sukman, it was made from thinner material so called lit. It is considered that the name litak is derived from the name of material. Domestic wool used for weaving litaks was dyed in black. Litaks in Trn area are balck with fine lines. The newer litaks, preserved till present, are differ from old in that the parts inserted under arms are narrower so it is tighter to the body. Litak is knee length. It was decorated not only with wool, but with silver yarn, glittering ribbons, yellow metal buttons and braids. With time, litak gained more comfortable cut and more diversified patters and decorations. With simple form and original combination of embroidery, both on litak and shirt, the female Trn costume was widely spread further than Trn area. The shirt changed the same as litak. Later lace was attached to shirt to the part that was visible under litak. This kind of lace, only smaller, was attached to décolleté as well. Besides wool socks, women also started wearing cotton. Simple footwear was replaced with shoes called "crevice". Women used to wear knitted waistcoats as upper clothes, and later they wore velvet coats. These were shorter coats, waist long, with rabbit or fox fur around neck and hands. Women wore braids and covered their heads with scarf made of cotton or silk in different colours. They tied scarf in "rabbit" form and added a flower on the right or left side depending on whether they were married or not. They wore a necklace of guilders which gave glitter to litak. Litak changed its seams and decorations, but the form remained unchanged. In some places it is worn without

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embroidery, and in some places with simple embroidery around décolleté and rims, or ribbon fringing. In many places, the shirt was simplified with little embroidery and few beads around décolleté and on the rims.

Trn national costume is one of the nicest and most practical Bulgarian national costumes. It tells the story of hardworking and industrious women from Trn, culture and everyday life of citizens in the past.

Male costume

Unlike female national costume, male national costume completely disappeared from Trn and Caribrod. Even the oldest citizens are not wearing it any more; it is used only for special occasions and cultural celebrations. Male costume is called "baletine". It is probably because of the colour of cloth from which it is made, white thick aba. It comprises trousers called "breveneci" in this area and shirt and upper garments ("dorance"). Breveneci, the same as litak has simple cut. They have close fit with tight hoses decorated with black braid. Breveneci trousers are comfortable for wearing, but they went out of use very fast, probably because they were maid of white material and people started making trousers from black aba. Shirts were made from cotton and linen cloth, simply with just an opening for head, without collar and without decorations. Upper clothes is dorance which is composed of two front parts and one back part where there is an inserted part for overlapping. Dorance had two pockets and no sleeves with black braid around certain cuts and it is worn together with red belt. Thus clad men wore leather cap and leather footwear called opanak. The preserved national costume, which did not change significantly, proves that citizens of Jerma and Kraiste saved their original traditional way of life which distinguishes them more or less from other Bulgarian citizens.

Photos

1. Memories of the festival friendship, 1910
2. Old Trn litak
3. Trnska children's costumes
4. Boys from the village Vrabcha, 1911.
5. Sisters from the village Rejnovci, 1919.
6. Trn male costume
7. Trn national dance "selskata"
8. Trn family in 1896.
9. Wedding pitcher / cup
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12. Festive woman's costume from the village Slisovac
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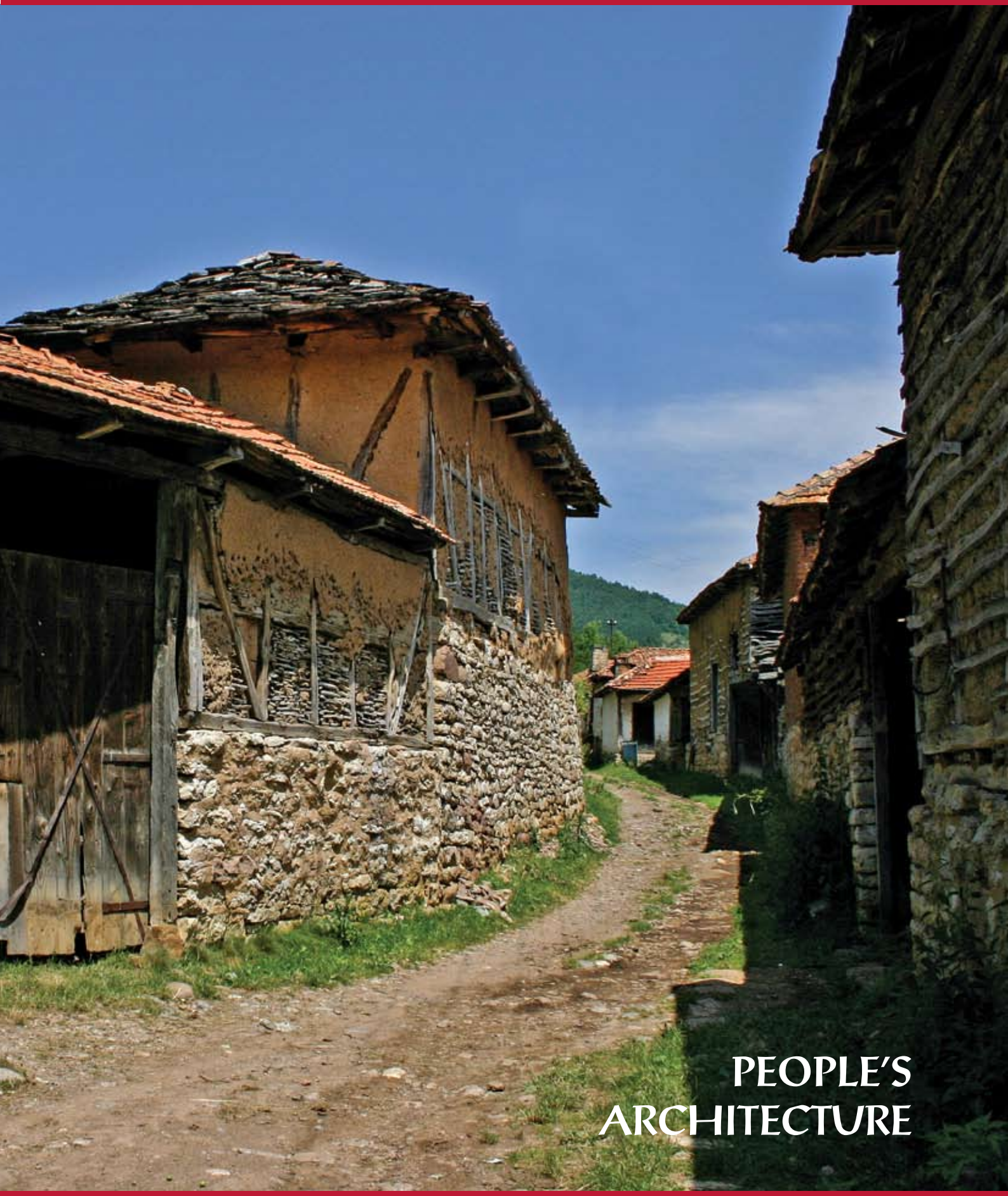
14. Trn woman is winding the yarn on the spindle
15. Women from Businaca selling pottery
16. Businci pitcher / cup
17. Ecclesiastical court of Businci
18. Businci master potter

Evgeniya Nedyalkova Takova



PEOPLE'S ARCHITECTURE

TO SHELTER

One of basic human needs for each individual was to shelter and protect themselves from the environment, which is why the architecture is considered to be one of the oldest human crafts.The man, together with the tribe it belonged to, was firstly hiding from bad weather in the nearby shelters, and as time passed and the intellect developed, the man started building and creating shelters which were not ephemeris, but were intended to last. Apart from bad weather, the man was protecting himself from wild beasts and people from other tribes.

From the construction of the first shelters in the caves, first cottages and dug-outs, up to modern skyscrapers with hundreds of floors, a continual and very exciting path has been created. Thus, the man started with the archetypal shack (picture 1) and after a long period of time, passed on to the solid way of building. For the grater part, it represents evolution. Only few of its historic parts can be called revolution - when new materials were discovered (for example – discovery of steel at the end of 19th century) or when new building techniques were discovered. This would significantly change the time of construction, flooring, quality etc. Unlike revolution, evolution was much closer following the development of people's architecture. As already mentioned, man started with the archetypal cottage, and it took him long to turn to the solid way of construction of unicellular and later multi-cellular. This type of development was conditioned by the choice of material, its processing and the way it was applied in construction. It took ages for empirical understanding which materials are suitable for putting up buildings and how each of them should be used, what their durability is and in which environment it would last for long.

MATERIALS

Some materials are often said to be cold, others are said to be warm, some are soft or hard, other are light or heavy etc. These are the epithets used by ignorant people (concerning architecture), but when they use them it is well understood what they mean, and what is more, they are right. A part of it we personally realize when we come in contact with certain material and some of it we hear from the adults in our childhood, such as "don't sit on the stone, you'll catch a cold" or "don't climb the tree, it will break."These are the sentences that we are listening to every day. No one knows when they were said for the first time, but it certainly took long time to come to them. It was in an empirical way that the man came to the conclusion

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which materials are good, and which not, and in which way each of them should be used in architecture. For constructing primitive facilities, lighter and simpler materials were used, both regarding difficulty and simplicity of processing. Up to the moment when the man started making and using tools in his production, the materials had been used in the form they could be found in nature, completely unprocessed. The esthetics was not being taken into account, it was important to fulfill the basic need that is sheltering. After the discovery of certain tools and, with them, new ways of processing, materials were used in a different way, which created a possibility to choose and furthermore established esthetics in architecture. This path is perhaps best described on the example of wood as material and the methods of its processing. Wood was first used in the shape in which it could be found in nature – cylindrical in shape, having different dimensions and characteristics. It was easiest to collect brushwood because it takes only human strength to shape it. With the use of different shapes of axes, thicker wood came into use and it was modelled in length, that is different beams were made. Later, similar tools were used to make various incisions with the aim of making various joints to reinforce the construction. With the development of different elements these joints became harder and more stable. The use of different shapes and profiles of wooden elements created the variety in construction and thus aesthetics was created. The development of tools and joints was continually improving which led to bigger and more complex constructions and the time of construction proportionally shortened. The development and use of other materials caused the characteristics of wood, which was used together with those other materials to improve. Wooden waste and wooden particles became raw material for making huge wooden elements, having much better characteristics than the wood alone.

The architects were always using materials that were at hand's reach, that were easy and cheap for conveying to the construction site and that were easy for processing. Different areas on the Earth abound in different construction material. Thus there are mountainous areas which abound in quality forests. Wood is there used for all purposes, from constructions to furniture. Houses are called a barracks or log house which depends on the method of modelling the wood. In rocky areas, the main construction material is stone, both for building and paving, covering etc. In planes, which abound in arable land, there is usually no construction material but earth, or it is bad quality. In this areas earth is modelled and different forms of bricks, blocks, and earth tiling and pottery elements for households are made. On the other hand, for our area the igloos – houses made of ice, that is water in solid state of matter- seem completely surreal. It is even more unbelievable that in such houses the temperature changes from -30° C to zero with just a human breath and that you only need a candle to heat the temperature to unbelievable +20° C.

It is not a rare case that some materials, row or processed are delivered from other climates, which increases the price of construction. When the residences are constructed the price is ignored. Everybody tries to build what the sovereign has imagined because this building will firstly be his monument and then keep his name in history. On this occasion the choice of quality material and its processing are elevated to the highest possible level. It was very often

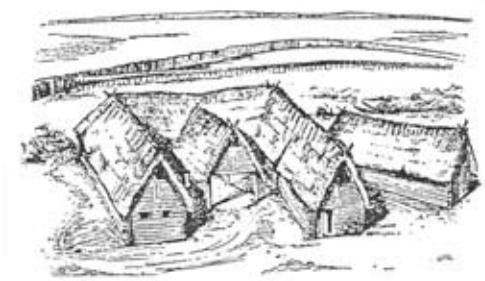
that sovereigns set too high goals for themselves so the buildings often stayed unfinished or were finished long after they died. The examples of such capital buildings are pyramids in Egypt, temples in Greece, the great China wall etc. However some similar works had very bad luck. They were often plundered by people because of valuables and construction material. It was often that the stone was taken from fortresses to the villages and there built in the houses, as was the case with the Coliseum in Rome. Some emperors were aware of this and banned the sacrilege of cultural monuments in this way. Thus when the Church of St. Peter was built in Rome it was banned to use the stone form historical monuments in 10 km radius, and every found stone with some inscription had to be preserved.

We associate different materials with different periods of time, and at the same time each period is characterized by different processing and application of the same material (picture 2). In this respect, "bondruk" systems of wooden elements are left visible in the north European and middle European countries, while within the Balkans they are hidden in the walls. On the other hand wooden elements used in our areas have square crosscutting, while in Nordic countries they are cylindrical.All these similarities and differences between places make the world the way it is, thus giving character to each nation and culture, which is why we, as temporary users of this area, are obliged to cherish and protect it.We can refer to ourselves as WE as long as we possess the qualities that make us special. However in order to know ourselves we need to compare with others.

Wood

As earlier said, wood accompanies humankind from the very start. People use many panegyric adjectives for wood, wood is said to be warm, agreeable, natural, and it is said to "breathe". However, there are some negative characteristics which can be considerably reduced or completely neutralized by contemporary methods, and these include that the wood is easily inflammable, that it rottens, has low carrying capacity etc. All these aspect potentially bearing risks for construction and building, many quality solutions have been found recently. Thus the anti-fire sectors are built, heat – resisting coatings are used, laminating is used to bridge big ranges and for the improving quality of wood.

It is characteristic of traditional wooden houses, since they are located in the upland areas, that they are "on celica" i.e. on a slope and thus have either a cellar or a stable which is half in the ground and half on the ground in order to even the terrain. The other characteristic of



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these houses is that they are often made in such way that they can be easily dissembled and then identically assembled on another spot. In extreme conditions these houses could act as sledges and be moved down with first snow to the mountain seat, and in spring before the last snow melts, they could be brought back to mountains.

Preparation of wood for construction starts right after lumbering. It is necessary to cut the tree in requested dimensions and cross-sections and leave it for drying, which can be natural or technical. Wood humidity influences considerably its characteristics, so it is very important to dry it carefully. For example, the weight of beech timber with 30% of humidity is 1070 kg/m^3, and when the humidity is below 15% then the weight is below 690 кg/m^3. It should always bear in mind that wood shrinks while drying which changes the dimensions, and also when dry wood comes in contact with humidity there is swelling of wood, which causes the wood to "work". Humidity influences sound and thermic characteristics of wood, and they are considered to be good if the wood is dry. Humidity is the factor which influences the durability of wood constructions, which means that if wood is constantly under water it can last up to thousand years (a ship on the bottom of the sea), and the same is for absolutely dry environment, however if it is in the environment with changeable humidity then the durability would change proportionally. The toughness of wood, which is influenced not only by humidity but by other factors as well, depends also on the way the wood element is weighted, that is whether the load is along the fibres or at right angle. The same as with other materials, wood bears more easily the even load than the changeable one, because the fatigue of the material is more slowly reached.

Apart from these technical characteristics, it is important weather the tree has any flows in its structure – upset grain, heart shake … Details such as knots and ingrown bark can significantly devaluate the characteristics of wooden element. After the tree is sawed there can be problems if the timber is not adequately stored. There can be twisting, springing, cupping, bowing or there can be end shakes. Bad storing can result in insect niches or rotting which affects colour and technical characteristics. In order to avoid all potential problems it is necessary to store the row timber into aired room where the elements are separated with distancers.

Wood in construction can be used in different ways. Firstly, the wooden construction system, better known as bondruk (picture 3) is a wooden skeletal system composed of pillars and beams, usually orthogonally arranged, and different bowsprits used as support taking over the action of horizontal forces (earthquake, wind) and transferring them to the ground. That is

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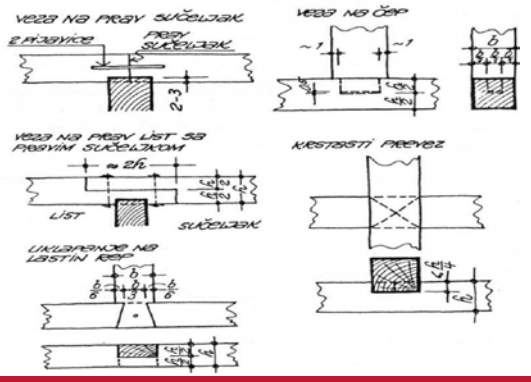

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why bondruk (post and pan) constructions are considered to be very resistant to earthquake. After the skeleton is put up, the filling between the shafts is possible to make in several ways: by mixing earth and straw and animal dung (to increase solidness), thin willow or cornel wicker which enables the air flow (good for barns and driers) and which makes the whole system harder, slabbing both sides and then putting sound and heat insulation in the middle. The most sustainable solution is to build a small wall of bricks which might be facade bricks or the wall might be plastered. The brick would insure the skeleton but would not transfer vertical load. In some places the skeleton is left visible and that is why it has to be specially protected. That is why the timber must look nicely. With the bondruk constructions around us, that is the type they belong to (orientall-balkan), the wall is plastered with mud and then it is painted. Such wall is not resistant to wind, rain and sun and a very big canopy is made to protect it. It is often up to two metres wide.

Apart from bondruk skeletal system, lumber can be used by arranging the elements horizontally one above another, thus creating a block-house or a barrack (picture 4). In both cases the lumber is arranged horizontally and the elements are joined in the ends either by different types of incisions or by some connecting devices. The difference is that beams, rotund lumber, are used in case of block-hoses; and in case of a barrack geometrically equal lumber is used. In Nordic countries thick trunks are put to prevent the passing of heath. Nowadays it is possible to put heath insulation within wall and thus improve the characteristics of the wall.

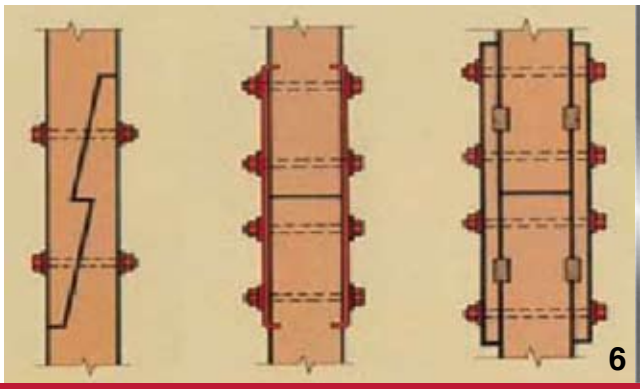
Wood construction is often elevated from the ground and put on a stone, recently concrete basis, in order to prevent the contact of wood and ground. This would cause the wood humidity to change very often and thus the construction would get old very soon. In case the wood must be in contact with the ground, it must be first protected with the agents that would prevent the water soaking.

Wood construction joints can be carpentry (picture 5) and static (picture 6). The carpentry joints are:

- Butt joint (straight or oblique)
- Halved joints (lap joint, dovetail joint, dovetail halving)
- Bridle joints (corner, t-bridle joint)
- Tennoned and mitred joint.

Static joints and elements can be:

- Elements with strained straps (when the acting force is separating them)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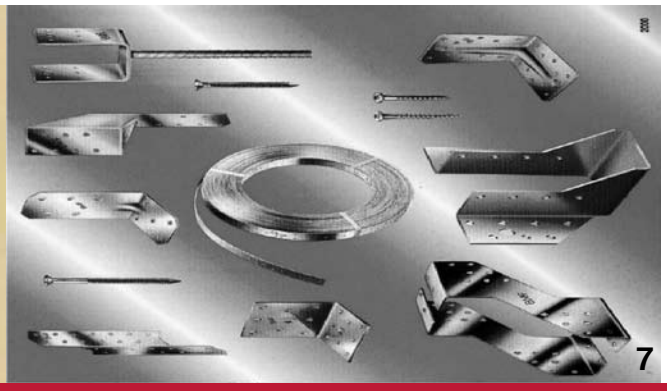
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- Elements wit pressed straps (when the acting force is pushing them together)
    - Notched joint with strained straps
    - Joints wit pressed straps at an angle with the mat
    - Joints with pressed straps at right angle
    - Joints with the help of other elements (picture 7)

For all above mentioned joints, only wooden elements can be used, without any other connection means if the force acts in such way that one element overlaps the other. If the elements are being separated by the acting force then other connectors should be introduced. In the majority cases the notching should not be more than one third of the height of the wooden element, unless a direct trust is underneath it (a post or some other joist). When the installations are introduced, the place where the joint is drilled for a cable or a pipe should be in the first third of the height from top, and not in the bottom third which is strained. In case of a balcony, canopy and eaves it is vice versa, upper zone is strained.

Connecting means for wooden constructions can be:

- Bolt and nut for wood
- Spike
- Nails
- Screws for wood
- Different types of dowels
- Clavis
- Wood pins
- Glues
- Metal elements (made in workshops or industrial)

It is important to say that connections should not be combined because each of them reacts in different way. For example screws must be tightened from time to time, while gluing is static – hard connection. Also, for each connection there must be a calculation of the number of necessary joints, their type is determined and the way they are installed. When it comes to small scale buildings it is allowed to rely on experience. Care should only be taken that the joints are not put in the end of wooden element so it does not crack soon and that the joints are put on certain distance so that the wood does not crack in the middle. It should not forget that bigger joint must be drilled in earlier, otherwise the wood will crack. For small cross sections of wood elements approximately small joints should be used.

Wooden roof constructions are usable in almost all facilities, both small (picture 8) and big in range. In the past, the range was limited to the length and quality of lumber, while nowadays a special type has been developed in the wood processing industry - laminated wood. Small wooden lamellas are glued thus making big carriers which enable achieving of different shapes during construction.

Classic wooden constructions used for housing are much more familiar. Roof pitch depends on the roof covering and not on roof construction. When the covering is roof tiles the pitch is 30%, when the covering is sheet metal the pitch is 10 – 15% etc. Depending on the

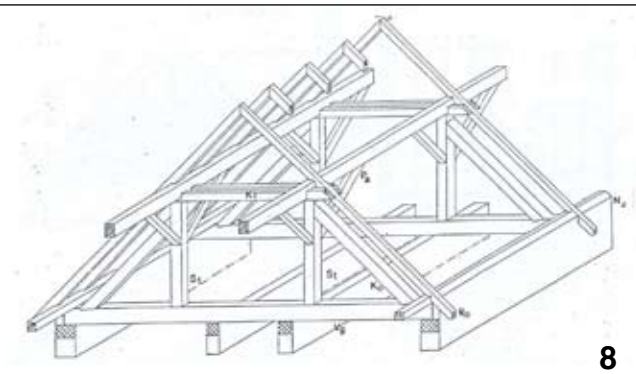
roof span, its shape, and whether there is a ceiling beneath or not and how it is reclined, the roof can fall into following categories.

- Single – sloped roof or shed roof (up to 4, 5 m of slope length)
- Single – sloped roof with double queen post or double trussed beam (up to 9 m of slope length)
- Simple double slope roof (up to 4,5 m of run)
- Double slope roof with single queen post or single trussed beam (up to 4,5 m of slope length on both sides
- Double slope roof with double queen post or double trussed beam (up to 7 m of slope length on both sides)

When it comes to slant queen post the rules are the same. The only difference is that the posts are obstructing if the user wants to use the attic space and if not they are not obstructing. When it comes to these classic wooden constructions we can distinguish between the following elements with their assigned standard dimensions for above mentioned spans: Rafter 14/10 cm, Ridge 14/20 cm, Joist14/20 cm, Purlin 14/20 cm, Upper plate 10/12 cm, Shaft 14/14 cm, Hurricane strap 6/12 cm, Roof boards 5/3 cm.

Wooden panel can be used both for exterior and interior. In exterior wood is used as paneling for walls and most often as wooden boards minimum 2,4cm wide which are hung on the skeletal construction, or as roof battens also minimum width 2.4cm. In both cases wooden boards should be less wide (up to 15 cm) in order to prevent disfiguring and cracking of wide boards. As interior paneling wood is used for paneling walls or for flooring as parquetry, wide plank flooring etc.

Wood protection is, as earlier said, necessary always when it is exposed to changeable humidity, insolation, temperature etc. In all these conditions wood can be protected either by coating or through clever construction.The wood is preserved from humidity, insects, heath, or the coating is done for aesthetic reasons. Nowadays there is a great variety of coatings which fulfil special conditions and have specific characteristics. In the past the wood was protected by smoking or parching, with bigger cross-cutting, or coating with some fat, which is why old mountain houses are today darker. When it comes to clever building, it should first decide where the wind is coming from and then set the position of the building. Also on these sides canopies should be larger to protect walls. The rain water drainage should be solved in the way that it doesn't harm the building. When building a wooden building, fire resistant sec-



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tors should be constructed, so in case of fire, sector by sector would burn which would make the fire last longer and enable one to extinguish it.

Earth

Earth as construction material came into use right after wood because it doesn't require greater effort for modeling. This material is possible to use in two different construction forms, one is fired (brick and other fired products) and the other is non-fired (compressed earth, adobe and daub.

Compressed earth is a very old construction technique in which earth is used in its non-fired shape. A wall is built up by putting a formwork 40-50cm high within which earth is staffed and then the formwork is removed and put up. However, today, with the application of aggregate and use of new tools and techniques, the formwork can be placed at 10-25 cm distance (picture 9). Adding cement to new systems of compressed earth brick is questionable because huge quantity of CO_2 is released. The compressed earth wall dries quickly and it takes two-three days for drying with optimal temperatures. The maturing of earth continues and lasts up to two years, after which such wall has characteristics of a stone wall. Compressed earth is very convenient when it comes to heath insulation in Vojvodina area, where it is mainly used. Unlike thermal insulation, sound insulation is almost ideal in these buildings. It was characteristic of Vojvodina that after each layer of earth a layer of cane was inserted to serve as reinforcement.

Earth is pressed with manual tools as in past or with pneumatic tools, which considerably facilitate the work. In both cases earth must be pressed down to 50% of its initial height. The advantage for the investor is that the framework does not need to be put up for the whole building, but only for a small height, because it can be taken down immediately after filling. The compressed earth walls are very easy for repairing - when some small holes are covered with new mud it blends very fast and becomes invisible in the wall mass.

Daub, unlike pressed earth, uses earth only for filling, that is earth in this case does not bear anything but the overall load is carried by wooden construction In this case the earth is put in the space between wooden pillars which is closed in length with unprocessed slabs or battens. They do not have to overlap ideally because earth cannot leak through small slots. Earth used for this purpose is most often clay which is first mixed with straw and animal dung so that mud connects well. In the past horse hair and animal blood was used so that the mud would

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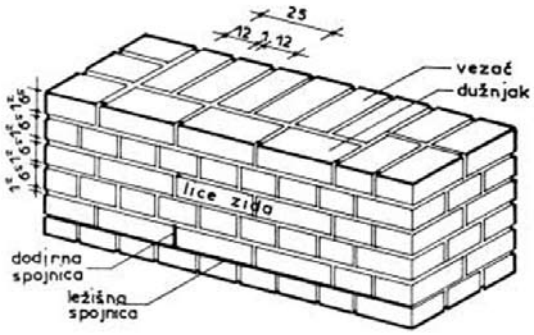

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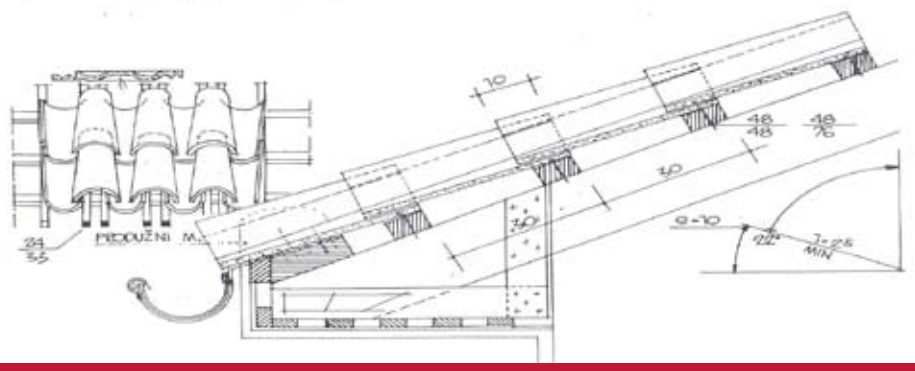
connect better. After filling in the last holes, the wall canvas can be plastered with mud and then pageted. This wall is very sensitive to the influence of rain which not only rinses lime from the wall, but damages it considerably. In this case, as said earlier, big canopy should be made, which became a trait of houses in east and south Serbia, Macedonia, Bulgaria and as far as Near East.

Adobe is a non fired brick and it is made in the similar way as the filling for bodruk. It is necessary to dry well this brick before usage. This mixture (picture 10) is poured into previously prepared moulds which give it the shape and dimension. Vitruvius (the first architect who left a written work) says that in Roman times bricks were left up to two years to mature and used only after that. Roman brick was somewhat bigger, but also thinner than today's brick, for the reason of easier drying in the Sun. Many preserved objects witness the quality of such system.

Brick, unlike adobe, is fired in appropriate brick stoves, which brings into question its sustainability, because a lot of energy is consumed for baking bricks. Nowadays, a lot of technologists are trying to find a solution for this, which is why different aggregates, influencing the thoroughness and firing time, are introduced. Today's brick is 25x12x6, 5 cm, as opposed to the times of Babylon, Rome and Austro-Hungarian Empire when each of these empires standardised the dimensions according to their conditions and needs.

According to that dimensions the wall can be 12 cm, (12+1+12) 25 cm, (12+1+12+1+12) 38 cm, etc. depending on the number of bricks put along the width of the wall (picture 11). Dimension of one centimetre represents necessary distance between bricks for connecting the plaster and it is called touching contact binding. This binding between rows in height is 1, 2 cm and is called bearing connection. The wall 25cm thick is considered to be the thinnest bearing wall, and has been considered thermally suitable until recently. However, the wall must be minimum 38 cm thick to have necessary thermal characteristics. In old buildings: churches, fortresses etc. the thickness of walls started with 51 cm and went up to one or two metres. When building walls of different thickness different bonds are used: common bond, cross bond, English bond, Flemish bond, stack bond etc. The thickness of the wall can be up to 6, 5 cm if the brick is built sideways or 6 cm if it is machine cut. In this case there must be a sub construction to which the wall is fastened. Otherwise a very small horizontal force is enough to achieve balance. When building there are stretchers (which are put in the direction of the wall length) and there are headers (which are put at the right angle with the length of



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the wall). They should rotate vertically in order to avoid the overlapping of bonds and thus cracking of wall

The golden rule when starting a wall is to begin with ¾ of whole brick. Because of its structure, it is possible to build completely even and big walls with bricks, which are no longer boring and empty. As it is small, compared to the whole wall, it is also possible to build waved walls, which was first used in architecture by Finnish architect Alvar Alto. The construction of arches and domes with bricks in sacral buildings is very famous and done by the best masons of the time. In the end, the brick can be plastered and thus covered or left visible if nice façade bricks are used.

Ceramic products are all brick products besides bricks, which was most famous and used. These are all products used for panelling walls and flooring.

Roof covering of earth is the most widely spread and it appears in different shapes, such as hollow tile (picture 12), biber tiles, classic tiles etc., all of which differ in dimensions and finishing. In some the finishing is completely even (biber tiles), and in others the finishing is completely wavy (hollow tile), while other types of roof tiles are in between and differ from producer to producer.

Stone

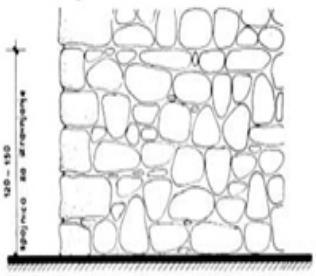
Construction stone is produced from the rock mass by using different procedures. Exploitation of stone is done in the queries/mines by using specific mining methods. When exploiting rock big parts of rocks are usually first detached by mining, and then these parts are cut, cleft and broken or minced in smaller parts, depending on the use. If the stone without any cracks is needed, then mining is excluded and exploitation is done by cutting or ripping with wedges. Stone processing can be diverse and comprises the mincing of rock pieces with or without simultaneous special processing of certain surfaces.

Stone modelling can be done in following ways:

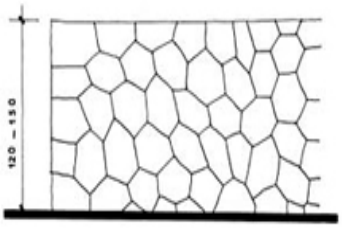
- hewing,
- cutting,
- abrasion,
- polishing

Stone division is done according to its use and depends on the area of its use. It is divided in two basic groups: technical stone and architectural stone.

Technical stone is the stone used as construction material in unprocessed or processed state, or as aggregate in engineering. This is why stone can be divided according to the level of processing into non-modelled and modelled stone.



zidanje oblutkama



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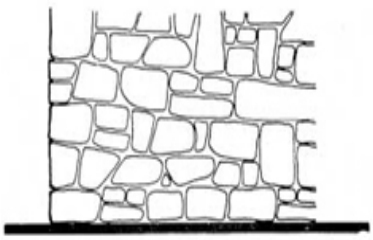

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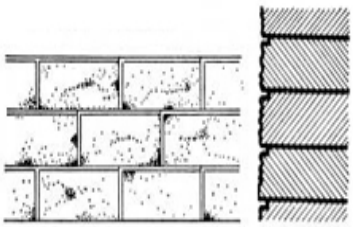

zidanje tesanicima

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Architectural stone is the stone which has decorative and protective role in constructions. It is used as panels for facades and interior wall surfaces and for constructing staircases and floors, and it is divided into stone for exterior application and stone for interior application.

Different sorts of stone are used in building construction. Depending on the conditions to be fulfilled, i.e. on the place of use in the building, certain sort of stone is used. Stone for building and decoration should be resistant to weather conditions, frost, aggressive conditions and that it has certain hardness when pressured. When it comes to staircases, they can be made of granite, diorite, porphyry, sandstone, marble etc. As decorative stone the following are used: granite, sienite, diorite, marble, travertine etc. for interior the following can be used: marble, serpentine, alabaster, breccias, conglomerate, tuff etc. The stone for flagging the interior can be limestone, marble and sandstone.

Protection of stone is necessary against fractures and deformities, separating, material losses, chromatic aberrations and deposits and biological colonisations. The protection measures can be constructive or measures of immediate protection.

Building with stone can be (picture 13):

• ***Building with stone cobbles*** that are taken out from the river. They are used only when there is no other suitable stone or when it is for aesthetic reasons. Bigger stones are put in the ends and smaller in the middle. It is possible to insert on every 1 to 1, 5 m 3-4 rows of bricks with the aim to achieve alignment. The building is done with plaster of hydraulic lime. The thinnest stone wall is 50 cm or 20 cm more than the brick wall. In residential buildings it is desirable to put on the inside a thin brick wall which is put on the 6-7 cm distance thus creating air buffer zone.

• ***Cyclopean walls*** are built with roughly hewn stone in the shape of a polygon which can be seen on the wall face. It is characteristic for this type of construction that three bonds always meet at one point. The name originates from Greek mythology from the one eyed colossus.

• ***Construction with shattered stone*** can be one with simple shattered stone or layered shattered stone. In both cases the optimum height of stone is 15-30 cm and length is 4-5 times the height and cannot be less than one height because of the redistribution of vertical forces and wall stability. As the stone is uneven, sometimes it must be hewn in order to fit in. The wall doesn't need to be built with plaster because of emphasized horizontal dimensions in relation to vertical.


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• ***Building with ashler*** is almost always connected with some representative buildings where each stone is made in line with a technical drawing. This requires a lot of time for modelling and thus increases the price of such edifice.

Stone as roofing (picture 14) has its advantages and disadvantages. The advantage is that it is durable and the disadvantage is that it is very heavy and a secure roof construction must be provided. Stone used for roofing must be in plates and with optimal dimensions which enable mounting the roof and the smallest number of joints. The panels are put in such a way that looked at, each of them seems diamond shaped with the sharp angle pointed downwards

Straw bales

The first association on straw house is the animated movie "Three piglets" and the wolf blowing away their house. The question is what would have happened had the three piglets knew for the straw bales, and not only simple collected straw? Straw is material that abounds in our environment, it is cheap and sustainable. There are a lot of doubts concerning this material when it comes to heath permeability, fire fighting security, problems with insects and many others.

Straw must be left in milk of lime before the use. Thus all insects in it are destroyed and the milk is plastifying it and protecting it from further attacks. The next very important step is to pack the straw well inside the wall in order to prevent further outside influences on it. Straw can be a bearing wall; it doesn't request other solid materials. They can be used only as panelling for the wall or its protection. Straw wall is usually 45 cm thick (picture 15) and with this thickness it has the three times lower grade of heath insulation than the present regulations and modern materials. Sound insulation is on a high level. When it comes to baled straw, the tests show that its fire resistance is limited to 30 minutes. This is achieved because the straw is pressed and there is no space or air inside the bale, which contributes to onflaming. If the wall is plastered then the fire resistance is raised to two hours which astonishes, even in comparison with materials such as wood, steel, concrete. One should take care of the quality of construction that is to prevent the straw going out of the wall because it can virtually be a fuse for fire.

On the other hand non-baled straw is also convenient for making heath insulation in combination with other material in modern or traditional ways.

Cost –effectiveness, as already said, is definitely a factor which helps the development and


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surviving of such construction – low costs of electricity, easy for construction, fast to build, cheap material and above all sustainable and natural environment.

Cane

Cane as material is characteristic of swamp areas and in some characteristics it is very similar to straw. It is bigger and tougher than straw. Cane is sometimes used for ceilings on the lower side and then it is plastered over. In this case cane fibres are connected and plates of different thickness and dimensions are made. They are hung on the ceiling that is on the previously made wooden truss. These panels can be used for covering tendas, canopies and roofs of housing units. (Picture 16). The other usage of straw is as an insulation plate, for which the standards are very high today, but it is pushed away from the market by a very low price of Styrofoam. The good thing about this material is that one can solely prepare the needed quantity and thus procure construction material individually.

Vertical Greenery

It is very often that buildings which do not have special architectural importance, as well as towns with low level of greenery are clad in green shell which is hang on the sub-construction (picture 17). This method increases visual quality of the building and its thermal characteristics.

TOOLS AND TECHNIQUES

Tools have been continually developing, so it is very difficult to decide what should be used and when. One very important characteristic of each original architect is to find something that would solve their problem at once, that is, an architect is as good as he is resourceful and capable to solve the same problem in different ways, both when lacking tools and in construction sense. It is a fact that there are never enough tools. That is why we will mention here only some basic ones (picture 18), which we consider inevitable.

Tools for wood modeling

Presently electricity powered tools are increasingly coming into use. They are first used to cut the tree, then for sawing and modelling and in the end for installing. These tools are so

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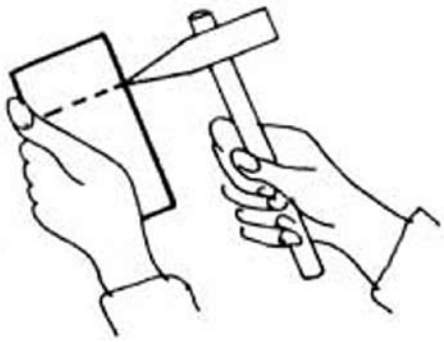

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widespread that they can be found both for professional and personal use, which determins their price. However when it comes to traditional tools the choice is the same as ever. In order to cut and process a tree an axe is needed. When it comes to cleaving of tree into smaller slabs or boards the axe is combined with axle – pins which mark the direction in which the tree is cleft and makes sure the thickness of the wood remains the same along the whole tree. When the timber is ready for use many notches are made in it. Depending on the position the timber is modelled with a hand saw which is used for determining the thickness of the notches. Then these notches are processed with a hewer, various chisels and bolts. For installing wooden elements drills are used, as well as hammers, chisels and other tools, depending on the mode of joints or connectors. For all additional processing and decoration of wooden elements, graters, emery and chisels are used. When the whole construction is finished it is necessary to protect some elements by painting, varnishing and simple coating.

Tools for stone modeling

The same as for wood, the development of modern tools was also necessary for stone since the processing of stone is very hard and tough work. The masons with rich skills in this field were very rare in the past and today almost do not exist. Depending on the sort of stone to be modelled and whether it is rough or fine processing the appropriate tools are used. For rough processing, that is for breaking and hewing of stone it is necessary to have a wide range of hammers and tenons. For building, the same as for other materials, different standard tools are used: hammers, plumb-line, level, rope for direction, trovels … Fine processing of stone is done by polishing the stone in different special ways always under a spout of water in order to reduce the dust and small particles. The proof of the advancement of technology is the fact that both stone and steel 30cm thick is today cut by a spout of water under high pressure

Tools for modeling bricks

Brick is much easier for processing than stone, and it is done only when the size of standard elements is not suitable. As each new row in building with brick is started with ¾ brick, it is necessary to cut the brick, which is done by a sharp hammer (picture 19). The same elements are used for building with brick and stone, with the difference that with brick higher precision can be achieved because of the geometrical shape of bricks.

Mitov Dejan

WEAVING

It is a known fact that textile, as one of the man-made products has one of the longest traditions in the history of humankind. The weaving workmanship has existed and developed for millenniums; however it has always provided new experiences and materials of undescribable beauty and attributes. That is why waving is always an appropriate field for artistic and technical innovation.

Hand weaving is a challenge. During weaving a weaver makes and creates a whole design which means not only the appearance but the whole range of important traits which the material must meet. As a creator of a new value, incorporated in the fabric made through a patient and industrious work, from an idea to the complete realization, the weaver commits themselves to the work, which for a reason, belongs to artistic crafts. First, the basic steps of the weaving workmanship have to be mastered, after that there is a phase of exploration, searching, studying and reflection on weaving.

For learning weaving handicraft one needs patience and love. The weaving technique is studied first through getting to know the tools, which improved over time, and through copying some basic woven objects. Gradually, the weaving technique is mastered by using more and more demanding materials. During this process, a weaver always brings in something own and individual, characteristic only of themselves.

MATERIAL

The weaver must understand and be familiar with the technical characteristics of the material used, as well as with the way in which the materials and row materials can be adjusted to the production requests. The knowledge on the raw material and materials, and the way they are used, will influence the functionality and appearance of the object made.

When weaving, it is necessary to bear two preconditions in mind: the material which is available and the production methods suitable for that material. This order is important, because the material which is available to the weaver conditions the method and tools that the weaver will use. The function of the object also dictates the choice of material to the weaver. The functionality requests met, the weaver often doesn't have any further limits to influence their final product. This freedom permits a great artistic creativity and results in a great variety of the products made.

The waving materials used to be only natural, but with the industrialization, artificial materials came into use as well. For manual weaving, making of fabrics, textile fibers with certain



fiber thickness, length and strength are used. They are divided according to their origin (this is one of many classifications) into two main groups:

Natural textile fibers

- Herbal fibers (cotton, linen, hemp, or known in our area as grsnica, sisal, jute);
- Animal fibers (wool, alpaca, angora, mohair, camel hair, cashmere);
- Mineral fibers (asbestos).

Chemical textile fibers

- Cellulose fibers (cellulose, viscose);
- Protein fibers (casein, alginate).
- Inorganic fibers (glass, metal);
-Synthetic fibers (polyamide, polyurethane, polyvinyl, polyester)

Any kind of yarn can be used for making textiles. Earlier, only natural, herbal textile fibers (cotton, linen, hemp) and animal (wool, silk) were used. In recent times, all yarns are also used for manual weaving, solely or in different combinations. The use of two or more yarns in one textile, mixing two threads of different raw material composition and their use can give extraordinary effects in their appearance and textile quality. Special appearance and rusticity are achieved by application of different effects of boucle yarn and colored yarns.

Since in the wider region around the border between Serbia and Bulgaria, 75% of households were breeding sheep at the end of the 20th century, wool was the main material for making products necessary in a family. During summer, women were growing hemp as well, more known in Bulgaria as grsnica, and used its fibers to make finer yarns. Silkworm breeding was also present. The majority of manually made textiles are still made of natural fibers (wool, cotton, linen)

Natural row materials of soft fibers used in hand-woven objects, mainly clothing are: wool, cotton, linen and silk. Raw materials of hard fibers are mainly used for making textile fancy goods (bags, belts), mats, beddings, tapestries. It is interesting that wool is mainly used for making beddings on horizontal and vertical looms.

Wool is dominant in making rugs. Honey combed wool, spinning, is possible to use as multifold thread. It is necessary to double combed fine, thin and smooth spinning. The fabrics made of wool are soft and warm. Wool is used both as warp and woof for making Pirot rugs. It should not forget, especially while cleaning, that this natural fiber is not resistant to high temperatures.

Cotton as material used for manual weaving has great strength but not enough elasticity. It is used for weaving both as warp and woof on horizontal loom; while on the vertical loom it

is used as warp (Ciprovo rugs) and rarely as woof.

Linen spinning, as well as hemp, is very demanding for manual weaving.

Silk has its unmatched beauty, elasticity and great delicacy, so it is recommended for weaving on horizontal loom and for very fine reed. For hand weaving it is suitable to use the combination of silk and wool for warp, because it gives very interesting results

All types of material used for hand weaving first maintained their own natural color until a need was created for their change. That is why they were dyed with natural, herbal dyes. First, leaves of certain plants were used for dying, than foot-stamps, root or a complete plant were used. Later some types of earth containing iron oxides were used for dying. All types of natural spinning were dyed: wool, cotton, linen, silk, then chemical fibers with the advancement of technology. Natural fibers were treated with special protective agents in order to protect their structure from parasites attacking them. This protection has recently become necessary.

"Spinning is the source of endless inspiration. Cooperation with spinning creates opportunity to reconcile design and form in many purposes. If the design is simple, adjusted to the use and spinning, our work will not be temporary fashion, but timeless."

Ani Albert,
Bauhaus Schoul of Arhitekture and Desing

TOOLS AND ADDITIONAL EQUIPMENT

The basic tool used for making hand-woven products is the loom. Since the very start of their use till today, nothing has changed in the construction of looms. The loom consists of two wooden beams and a simple frame on two columns.

According to the position of the warp which extends between two beams, the looms can be divided into horizontal and vertical. Vertical looms are with vertically positioned warp. They are used for making tapestries and rugs (picture 1). Horizontal looms are looms with horizontally positioned warp. They are used for all types of textiles, but rugs as well. They differ in the work technique, complexity, technique of weaving that can be done, as well as in the construction (picture 2).

According to the technique we can distinguish between counterbalance and countermarch looms. ***Counterbalance looms*** are famous for their simple work and possibility for different


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intertwinements because the threads are moved in opposite directions, one opposed to the other, which makes a shed. In ***countermarch looms*** the threads can be moved independently of each other, so each can be lifted and lowered, which makes a tighter shed.

According to the complexity of work we can distinguish between looms with two and four threads. Two thread looms are very simple; they work in two steps, so they are convenient for weaving cloth. Four threads looms enable greater number of intertwining, so the structure of the fabric is richer. They can perform a total of fourteen different combinations of lifting.

According to the construction there are table and floor looms. Table looms have smaller dimensions and can be placed on a table. When working on them only hands are used, so weaving on them is somewhat slower than on floor looms, where both hands and feet are used. With the help of treadle, the threads are lifted by feet, and hands are manipulating the frame and move the shuttle with the warp through a shed. This enables the simpler creation of textile. This kind of loom is much wider than the table loom and it makes long warp for making textile.

Apart from looms, additional equipment are necessary for weaving and these include necessary parts of looms, equipment for preparation of spinning and introduction of warp and woof into the loom.

Heddles trough whose eyes a warp thread goes. Heddles can be metal or made of yarn (picture 3).

Shafts which carry the heddles (picture 3).

Reed and heddle hooks for putting the threads through the eyes of the heddle and the reed (picture 4).

Reed whose purpose is to determine the thickness of the warp, it is determined by its constant position in the fabric and it presses the warp. It can be metal or wood and it stands in the frame (picture 5).

Shuttle for lifting the woof through open shed (picture 6).

Lease sticks for separating warp and fixing back side of shed (picture 7).

Yarn swift for rolling the spinning (picture 8).

Warping board for making the warp for weaving (picture 9, 10).

WORKING TECHNIQUE

The preparation for weaving starts with choosing the weaving object, its drawing and marking all of its dimensions. Then the yarn for warp and woof should be chosen. The yarn


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for warp should be smooth, nonstick, and non-stretchy, without any knots and strong, and it cannot be extended along the warp. The yarn for woof can be the same as for warp but also utterly different and it can be extended during weaving in the shed.

It is necessary to calculate the consumption of yarn for the warp of wanted textile. The consumption of yarn for warp can be calculated in different ways. One of the simplest ways is if the number of warp threads is calculated from the thickness and width of the warp. If this is multiplied by the length of the warp, the result is the total length of warp threads, i.e., total length of the threads necessary for making suitable warp. The length of the winded thread is usually marked on the bobbin, so the number of bobbins will depend on the length of the warp thread.

The consumption of yarn can be calculated by a formula:

Tg = (Lm x Wcm x Gcm) : Nm

where: **Tg** - is necessary consumption of yarn in grams, **Lm** - length of warp in meters, **Wcm** - width of warp in centimeteres, **Gcm** - number of threads in one centimeter, **Nm** - how many meters of spinning there is in one gram.

When calculating the consumption of yarn for warp, losses must be taken into consideration and added to the consumption. The losses are made while warping because of different tightening of threads on warping board. There are losses when connecting the warp to the warp beam and cloth beam. On the tightened warp, there are losses in the length of warp when weaving. Because of all these facts, the warp taken off the loom will be shorter than the warp put on the loom. The length of the warp should be increased by 10% for the losses while warping, and 10% for the losses while weaving and 60-90 cm for putting the warp on the cylinder and cylinder of the woven cloth. The width of the warp should be increased by 10% for the tightening of the edge threads and by 10% for the shrinking of the warp made by many intertwinings (lace and similar).

The project form for making a fabric or Weaving protocol should be made because all necessary data are filled in it. A weaving scheme for making a fabric, as well as fabric sample, should be added to the protocol. Thus, the archive of woven fabrics, as well as used intertwinings is made. The data filled in the weaving protocol are as follows:

WEAVING PROTOCOL

DATE OF WEAVING:

NAME OF THE WOVEN OBJECT:

INTERTWINING:


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EQUIPMENT:
YARN: for warp
for woof
WARP LENGTH: put on a loom
taken from the loom:
WARP WIDTH: put on a loom
taken from the loom:
WARP THICKNESS: number of woof treads in cm
WOOF THICKNESS: number of warp threads in cm
REED: number of prongs in cm
APPROXIMATE TIME USED FOR MAKING THE FABRIC:
PRICE OF MAKING THE FABRIC:
OTHER DATA:

Weaving

When we have done everything in line with the weaving protocol, the weaving process can start. Weaving starts by making the warp for weaving

Warping is making the warp for weaving and it is done on a warping board (picture 9). It consists of a frame with bolts on which the warp threads are winded. A warp 10 metres long can be made on this type of warping board. A loop of necessary length is made on the first two bolts. Between the third last and second last bolt, the threads are folded and intersected making a cross or an eight in order to make a shed.

The warp is fastened by yarn crosswise on several places before removing from warping board. First, the cross is fastening it, and then the rest of the thread.

Putting the warp on a loom

The warp is put on the back beam, i.e warp beam, first by extending along one part of its length, and then it is spread and put on a beam stick for winding on the beam (picture 11). Then the warp is put through the reed to get its full width. In the cross, made during warping, lease sticks are introduced to reinforce it (picture 12).

For winding the warp on the warp beam, two persons are needed, one to wind the warp on the beam and the other to hold the warp and slowly prepare it for winding. In order to achieve


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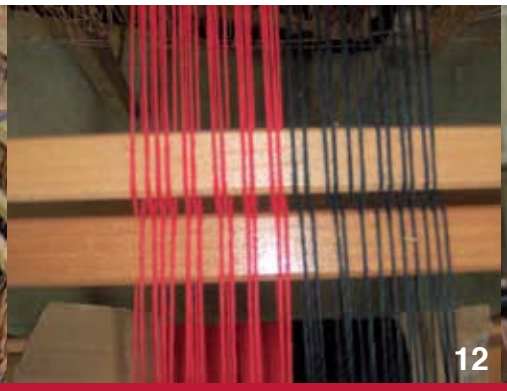
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the tightened warp on the beam during winding, warp sticks are inserted from time to time between the warp and the warp beam.

Introducing

Building the warp for weaving is actually slinging the warp for weaving from warp to cloth beam through the loom. When the threads are put through the eyes of the heddle and the reed, we connect them to the cloth beam (picture 13).

The way of introducing the threads in the heddles is shown in the weaving scheme. Four threads with heddles and eyes are represented as a sequence in the scheme.

The complete weaving scheme is in four parts: the way of introducing the threads, the connection between the threads and treadle or lift, the schedule of lifting the threads and treadle or lift, the scheme of intertwinings for fulfilling certain weaving scheme

The link between the threads and treadle is direct, meaning that each thread is linked to one treadle or one lift. Lifting, that is the arrangement of lifting the threads is decided by the numbers in certain rows. In the first row numbers 1 and 3 mean that it should lift threads 1 and 3 in order to push the woof through the first shed. Intertwining is represented by black and white squares which represent the tied points of the woof (picture 14).

Weaving on a horizontal loom

Now, everything is ready for creative work and joy during interweaving the threads into a cloth. Pushing or lifting the treadles, depending on which a loom is, table or floor, part of the warp's threads is moving up. With the shafts which are not connected with the active treadles they make a distance called a shed.

Through the shed a warp's thread is pulled. The thread is rolled on shuttle. This thread connects all threads of the warp into entirety making a cloth. When the warp is pulled through the shed, it is bitten by beater. After that - again pushing or lifting the rest of the treadles, pulling the warp, beating, till the end of the warp. Weavers say that when they pull the first thread of warp, time for them ceases to exist and remains only enjoying motion and creation. They are a little bit sorry when there is no the warp, their work is finished and they wake up from a nice dream.

It is considered that the first weaving on the horizontal loom was intertwining cloth. Intertwining cloth is an unavoidable companion on the weaving journey (picture 15). Even today, this very simple intertwining is used when making a straight textile. Starting from this inter-


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twining we are able to combine and get different variations of intertwining: panama, caper, honeycomb, overshot. The weaving of double textile can be done on the horizontal loom, as well as weaving with several threads and lace weaving, which can be woven on the very loom or by weaver's fingers. Combining the colors and intertwinings we will get remarkable textiles which are very colorful and ready for use or further processing (picture 16).

Weaving on a vertical loom

Vertical weaving loom has a very simple construction and is made of two cylinders which are fixed to the vertical pillars. Pillars keep the cylinders between which the warp is extended. There is a cylinder in the middle of the loom for which the warp strings are tied so the shed is made. The cylinder is tightened by dowels and the shed is formed. The tools, used in kneeling technique, depend on the type of object of weaving (reed or so called beater). Reed is used for weaving tapestries, and for weaving rugs beater is used. Yarn swift is used for winding yarn on bobbins.

The warp treads for vertical looms are made by winding the two threads that form a shed around the warping board. The warping board is very simple; it is made of half cylinders whose distance depend on the length of the warp that needs to be put on the loom. The warping is done in the form of endless circle (picture 10).

The kneeling technique is used on the vertical loom. It had been known in our area obviously even before the settlement of Slavs on the Balkan Peninsula. Since the area was famous for cattle husbandry, the abundance of raw material found its use in weaving of rugs, so rug making was simultaneously developing on both sides of Stara Mountain. The famous reporter Feliks Kanic wrote about the trade of rugs in Pirot in Serbia and Ciprovac in Bulgaria organized by merchants from Dubrovnik Republic. Wool was used for making these rugs. Later on, in the 20th century, cotton was being used for warp in Ciprovci.

In kneeling technique, the patterns are made by different colors of woof threads, introducing tufts or making knots. This technique is also used for Pirot rug, famous for its beauty, imagination, quality and durability. According to the richness of ornaments, they can be compared with the most beautiful rugs from the East. They are identical on both sides, which is accomplished by tight weaving of woof. Their colors are clear and harmonious. They can last over a hundred of years.

Slavica Jovanovic

POTTERY

HISTORY

Historical records show that pottery started developing in western parts of Bulgaria, especially in the village Businci, at the start of the 18th century. In the second half of the 19th century, there was a pottery wheel in almost every house in Businci. Some explorers of Businci pottery claim that there were more than 300 independent pottery craft-workshops there in the 70s of the 19th century, where approximately 1500 people – craftsmen, journeymen and apprentices were processing pottery. Abundance in clay, and its variety in this region, made a possibility for almost whole male population to earn for their existence from pottery.

The development of the market on the Balkan territory within the Osman Empire, forced labor outside the abode and gradual development of "affiliated" centers expanded the application of Businci pottery over a lot vaster area. At the same time, it stylistic and plastic variety was enforced, its image became a permanent sign of domestic environment through a profiled specific artistic shape and elements.

During the period of two centuries, Businci craftsmen potters were spreading their products and influences over the whole northwest Bulgaria and Serbia up to the Danube on the north, and to the south along the rivers Struma and Mesta, as far as to the Aegean Sea.

Businci pottery from the 19th century represents the blooming of the regional pottery center in which functionality and artistic solutions are reconciled. Because of good familiarity with the environment, its best pieces reflect the sense of the renaissance craftsman for the harmonization of form. Businci pots suit the specific needs for cooking, preserving food and liquid. Furthermore they have an important place in the esthetic development of the home interior, because many of the pots are ornaments (picture 1a and 1). For the picturesque bodies of the jugs new shelves are made and then filled with them. The richness of the functional solutions of Businci pottery found its application in the sacral sphere as well. The ceramic pots for festivals, grave lampions, censers are all expressions of local pottery trials to find utility answer for all life segments


1a


1b


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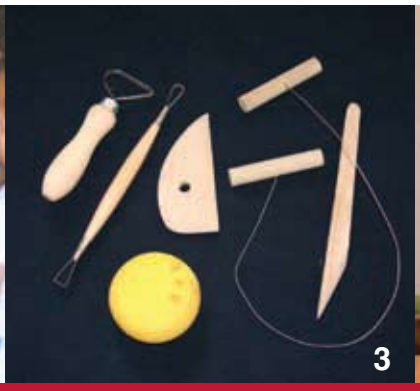
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MAKING PROCESS

The production of ceramic pots has several phases, the first of which is the preparation of clay.

Preparation of clay

In the whole Trnski region, especially in the village of Businci, there are different types of clay according to its plasticity: greasy, non-greasy, and slippery. Some of them are heat-resisting and are used for making tougher kitchen ware. The other have very pronounced plasticity so they are suitable for harder table ware, pitchers, bowls, jugs. They differ in color, from light to dark red.

The excavated clay is left outside for one winter. A day before its use the clay is brought in to a special place called "kalnik", it is sprayed with water and several times stamped by feet, before it gains thickness and texture. After kneading it is ready for modeling (picture 2).

Making of objects

The clay objects can be in different shapes. Furthermore, they can be partly or completely symmetric or completely asymmetric. They are made on a pottery wheel, or from even clay tiles, or by combining these two methods. The main tool for modeling is skilled fingers. The accessory tools are different wood, plastic and metal patterns for modeling, incision, punching, stitching, sponges, cloth, and wire for cutting (picture 3)

Making an object on a pottery wheel demands special skills for centering and maintaining symmetric capacity, while the wheel is continually turning, for extending and thinning the form aloft and broadways, closing the capacity and making the obligatory details. Craftsman potter skill is represented in achieving the wanted expression, proportion and details of the pot (picture 4). For centuries the pottery wheel has been rotated either by foot or by hand (picture 5). Modern pottery wheel is electricity powered and has continual regulation of speed. (picture 6).

After taking the pot off the wheel and a short period of mild drying, the construction parts are glued: handles, neck, and ornamental parts: rosette, shields, and figures. Afterwards, fine finishing is possible and decoration in the end.


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7a


7b

Decoration

Decoration with engobe is very widespread. Engobe is fine, washed white or colored clay. It fills the clay pores thus reducing the absorption of water during the use. It is applied on the dried pot by complete or partial soaking of the pot in a dish filled with engobe, or pouring engobe from a cup over the pot or by painting on the pot with a brush or other gadgets soaked in the engobe (picture 7a and 7б). One way of artistic finishing is to make engraving with a thin blade after applying of engobe, so that the lower layer of clay is reached and denuded (picture. 8). In the next glazing the contrast, between usually white engobe and dark base clay beneath it, is enhanced.

Drying and baking

After complete drying, the pots are arrayed one above another in the stove and for the first time baked "as cookies". The bigger pots made of rougher clay are placed on the lowest positions, finer are in the middle, and on the highest position are pans, in order to form an arch together with damaged and broken parts of pots. After mild heating for 10 to 16 hours, the fire is heated and the temperature is maintained approximately, that is according to the color of the fire in the stove. (picture 9). The baking cycle is programmed in modern electric stoves in line with the experience of the craftsman potter. (picture 10a and 10б).

After the first baking the pots are much stronger and they get dark color (picture 11). When they are completely cold and taken out of the stove, they are being prepared for glazing. Powdery glazing, transparent or colored is dissolved in water. Then the pots are either completely soaked in this solution, or the solution is poured over them, or it is partly applied by side soaking, pouring over certain parts, pouring only inside, etc. The glazed effects are enriched by colored metal oxides.

After glazing the pots are again put in the stove for second "glazing" baking. The baking regime depends on the peculiarity of the used glaze. The combination of the pots according to size and complexity, their touching on glazed or non-glazed spots, with a specific dose of risk of gluing, achieving and maintaining necessary temperature, all these things require great experience and craftsmanship (picture 12).


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10a


10b

Types of pottery

Businci pottery is divided into several big groups: table, life (everyday), technical, cult and decorative.

Many different basic shapes fall into these groups, as well as their numerous varieties. Businci pottery comprises extremely vast repertoire, more than a hundred main shapes, and great number of their varieties and sub-varieties. (picture 13). Springing from specific needs, improved over long period of time, gaining its form from specific technical limitations, this pottery represents the result of the artistic efforts of many generations of Businci potters.

PRESENT STATE AND PERSPECTIVE

In the first half of the 20th century, the craft was increasingly dying out. Around the year 1930 there were approximately 120 craftsmen potters. At the beginning of the second half of the 20th century the remaining Businci potters gathered in one small company where serial products were made. Unfortunately, in the summer of 2009, the last Businci potter died.

Is the spirit of Businci pottery alive, and can it be blown into the creation of modern Bulgarian ceramics – it is a question whose answer has been searched for last nine years. The idea to revive the artistic activity in one of the oldest centers of pottery, in Businci, is inspiring scientists, artists and local community. A great role in the active interest in craftsmanship of old Businci potters belongs to the plenary lectures on ceramics held almost every year, during last 15 years in Businci Museum complex. The participation of contemporary potters from Bulgaria, Macedonia and Serbia, together with the collection comprising great part of traditional Businci pots (picture 14), have created conditions for making patterns having modern note, reflection in modern life and bearing elements of old Businci tradition in the sense of colors, shapes and utility.

Boryan Kodjakov


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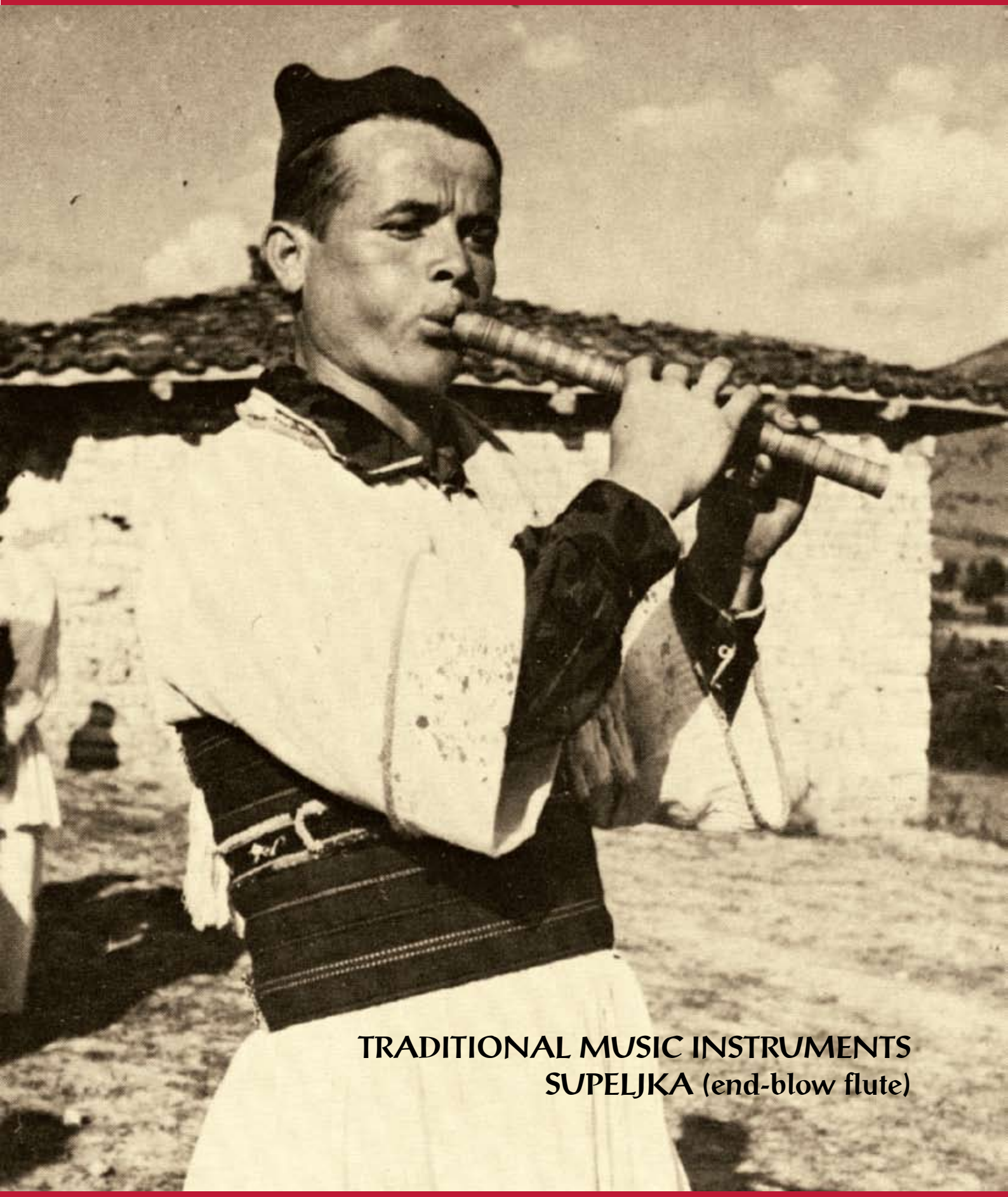

TRADITIONAL MUSIC INSTRUMENTS
SUPELJKA (end-blow flute)

HISTORY

The history of music instruments, their production and playing on them, can be said to last as long as the humankind. Data on different music instruments date back to prehistory; the cave drawings of prehistoric men depict different types of fifes and percussions, and the oldest historic sources are evidences of the use of instruments in religious purposes.

The man has a need to create, both tangible and intangible, cultural property. With the development of civilization, musical instruments also developed, as well as musical expressions. Starting from those primitive and simple at the dawn of civilization, musical instruments evolved into the present, complex, sophisticated means of musical expression.

This paper will address the making of wind instruments (namely end-blow flute-supeljka) and the use of natural material – wood.

A constructor of a music instrument takes material from nature, uses tools and techniques to make the instrument and is led by acoustics principles. Taking the available materials and making musical instruments from them, represents a process of transformation given to us by nature, and creates new values, which is a sort of refinement in nature. Acoustic properties of materials from time immemorial have been the subject of interest and research for people, not just for makers of instruments, but even more for scientists (mathematicians, physicists, philosophers). With the advancement of technology, the man got more complex and better tools and the development of science provided knowledge about the laws of acoustics. A constructor of a music instrument relies in his work more on intellectual then physical work. Tools and techniques of work are just means ("carpenter's" part of work - as said by constructors of instruments) in the process in which a natural material is transformed into a handicraft that you can play, which includes familiarity with materials and nature of sound in general (which would be craftsman's part). In this sense one can say that there is a relationship between man and environment, the natural materials and builders who use intellectual and physical work to make an instrument out of it.

Since time immemorial man has worked with his hands. There are crafts, but also fine crafts and art crafts. Handiwork is a human need but also a privilege, it is known that handiwork is beneficial for both mind and soul, therefore, it can be used in therapeutic purposes. In all religions of the world handwork is an important part of praising and self-improvement and is practiced on a daily basis, in Orthodoxy, for example, it is combined with prayer.

We live in a time of rapid technological development which is reflected in the development

of instruments. Laws of the market, the speed of life and the availability of sophisticated tools and machines have led to the completely industrialised production of musical instruments (the guitar for example, in recent times even the violin). Such instruments may apear to be perfect, and their price is very reasonable. Of course, these instruments can never play the same quality as the hand-made instruments. The reason is that the craftsman of hand-made instruments dedicates his attention completely from start to finish, and at every stage makes the desions based on the particular timber and the particular instrument. The point is that no piece of wood in the world is the same; even each piece of the wood of the same species from the same forest is not the same. Experienced artists know that even wood cut from the same tree from different places (more or less) or different sides of the cross-section (south-north) is not the same. This means that the ideal approach to construction of instrument needs constant physical and intellectual presence of the craftsman, and often relying on personal inner sense when making decisions

The process of instrument construction is a logical and defined process both in terms of operations and steps and in terms of interdimensions in the process row material - finished instrument, from start to end dimensions. However, during his work on the instrument, the constructor comes several times to the point when he needs to make a decision. In fact, all interdimensions and final dimensions are actually only recommendations defined through experience and are relevant for a specific instrument and a specific type of material - wood. (These recommendations can also be different depending on the school and tradition they come from). Further, methods, actions and steps are also framework norms that a craftsman, more or less respects in his work, while making a decision which of the recommended values (changeable up-down) he will choose in the given moment.

The conclusion is that there are certain limits within which instrument maker includes their knowledge, experience and intuition - a sense of making the instrument. Simply, “I have this piece of wood in my hand, I knock on it, listen to its acoustic response, I evaluate how bulky it is in my hands, I think that it needs to be a little more laminated ...” This is about craftsman’s sense of wood, sound, and the idea (inspiration) how to come up with a good instrument, which has been holding for centuries the whole mistery of famous craftsmen and their instruments.

Supeljka (end-blow flute) is a wind instrument made from a small cylindrical (mainly wooden) pipe, 250-300mm long whose interior is empty from start to end (fig. 1). The outside


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diameter of supeljka is approximately 20 mm, and the thickness of the pipe wall is 2 m. From the middle of the pipe towards the end there are 6 holes which serve to produce music from this instrument. The tone is produced by holding supeljka tilted to a side and blowing into the nib edge on the top of the instrument. Lately, there are end-blow flutes with seven holes (above six front holes there is a back thumb hole), as well as with eight holes (beneath the last hole there is another one added)

Supeljka is considered to be a very old instrument, but there are no reliable data about it. We can hear from stories of old players and masters that "it has always been there ...". Supeljka was a popular pastoral instrument of succession, "every shepherd was trying to learn how to play supeljka because it was a shame not to know how to play it." In addition, supeljka is convenient for carrying, due to its small size (belt or bag), so it could always be at hand's reach, unlike other, larger and heavier instruments.The absence of mouthpiece on supeljka poses a drawback for players beginners, because it requires effort before learning to play which is why playing the supeljka (as well as other instruments with no mouthpiece - kaval and nej) is considered to be a mastership.

Music repertoire of supeljka players can be divided in three groups:

a) Pastoral music (so called ezgije) - melodies out of the rhythm, which were created as improvisations of some famous themes, or as a instantaneous personal inspiration of a player; б) National dance music - melodies in the rhythm, with a familiar theme of a country dance or a dancing song; в) Signal melodies - melodies for leading a herd or for communication.

Supeljka (as well as kaval) is considered to be blessed, God's instrument because its tone provokes tranquility and peaceful mood. It is the instrument of shepherds who, being in nature with their flock could spend a lot of time on music (fig.2). That is the reason why supeljka was the creator of national creativity of high artistic value. Supeljka was the medium of national players - artists, inspired improvisers and creators, anonymous national composers, fast and good performers of national dance melodies, sensual and gifted performers of melancholic melodies. Supeljka is the instrument of shepherds and people bonded with nature, inspired by nature and animal sounds. It is therefore not surprise that the imitation of birds entered the style of supeljka players, whose color and tonal sound is reminiscent of the height of birds' song.Many music ornaments during playing the supeljka reminds of warble, and also there is music that imitates birds and does not have a specific melody.

Geographic distribution of supeljka includes area spreading over several Balkan countries, namely: Serbia - south and southeast (supeljka), Bulgaria (supeljka), Greece (flogera), Macedonia (supeljka) and Albania (fluer). Nowadays, with the creation of new living styles (in the country); supeljka is on the way to disappear.

Instruments similar to supeljka are kaval and nej which are also without mouthpiece- they are hollow, but are longer and have more holes so they can also be called long supeljka (fig. 3). On the other hand, fife (frula, svorce duduk) is similar to supelka which is an instrument with a mouthpiece and six holes, so in all respects, except for the mouthpiece, it is similar to supeljka. Therefore supeljka can be said to be a fife without a mouthpiece (fig. 4 и 5). Greek

flogera can be considered as an instrument related to supeljka, but it can be seen also as the same instrument, only with more holes.

MATERIALS

Materials used for production of supeljka are: wood, cane, horn, bone and metal and plastic pipes (fig.6).

As earlier said, ***wood*** is the most often used material for making supeljka. As the most available material in nature, wood has been used in human life daily for different purposes; as construction material, log wood, material for furniture etc. The man realized through experience which types of wood, with regard to their natural and acoustic characteristics are the best for making music instruments.

This is testified by the etymology of the names of some trees; such as: zova (eng. elder) - zov zvukom (eng. call by sound), jasen (eng. ash tree) - jasnost zvuka (eng. clarity of sound). We should also point out that old Slavs had special attitude towards trees, they believed that spirits of their ancestors lived in trees, that ghost hid in trees (even dead ones), as well as the fact that many toponyms in Slavs have names of trees (Leskovac - filbert, Jasenovac, Jasenak - ash, Drenica - cernel tree, Glogovac -howthorn tree, Lipovica-linden, Krusik - pear tree, Jablanica - apple tree, Orhovac-walnut tree etc) Therefore, wood had a very important daily role for our ancestors.

Elder (*Sambucus nigra*) - is a medium hardness tree. It grows near water, and the nearer it is to water, the faster it grows and the thinner and softer structure it has. Therefore, one should avoid elder that grows on low and flat terrain near water and look for one which grows on the more insolated side, on a steep terrain where water cannot stay, that is look for it far from water. This remark, concerning the choice of tree according to the terrain and distance from the water, is relevant for all trees. In folklore, elder is considered to be the fairy wood, and it is known that fairies love playing and singing. There are many poems and short stories in which fairies are connected with music, specifically the flute and the musicians. Interestingly, elder is thought to be "soft wood, not suitable for the instruments." Contrary to this view, elder is a very durable wood (used for the handles of pickaxes and shovels), and the instrument made from carefully selected calls has nice strong tone and looks good (due to the interesting texture of growth rings), so often such an instrument appears to be made of "a higher quality wood (fig. 7).


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The important advantage of supeljka over other instruments is its simplicity and possibility to make an instrument in a short time. Shepherds used to make supeljka from elder saplings by pushing out soft pith and opening the wholes by knife, getting an instrument in a short time. Elder saplings are new branches - this year's suckers, which are soft in the middle of the core around which is a thin ring of harder wood mass - pipe. Thus, by ejecting soft core a wooden tube is made. Thus made fife lasted for one day and it would break when it dried, but the very next day a new one was made. Serious instrument made of elder is made from branches (not the saplings), and it takes more time to make such instrument, and require the use of serious tools.

Ash (*Fraxinus,* sp) is a hard and tough tree. Ash that grows on the sunny side has a very dense structure and it is pressed. Nevertheless, when dry, it is "workable" (not hard to handle). Ash has a very pronounced fibrous structure which gives good vibrancy. Besides that when the ash is dry it is very resistant to moisture, making it a good material for the instrument. People say that ash tree plays clearly. Ash has nice texture (distribution and layout of growth rings) and color that goes from grayish and ashy to light brown. Because of this ash is often used for making supeljka and other wind instruments (kaval, duduk, double, etc.). Ash appears in several subspecies and is known as white ash and black ash, which is harder and more vibrant (Fig. 8).

Cornel (*Cornus mas*) is a very hard tree and with high resistance to illnesses and caterpillar. People say that it is a "steel-tree". Thus it entered the folk songs and stories as a symbol of hardness and health and someone who is strong is said that can drain water out of dry cornel (Prince Marko), while someone with good health is said to be to be fit as cornel (fit as a fiddle). Cornel, however, requires special attention. In fact, during drying cornel is prone to cracking. Also, the surface of cornel absorbs moisture when it is already dry. Thus, during playing, the moisture which is condensed inside the instrument is absorbed by the wood surface, which stresses the outer layers of wood and may lead to cracking. For this reason, it is particularly important for cornel to be well impregnated and thus protected from moisture. There are several subtypes of cornel, known among people as black and white cornel, and special type so called dog-cornel is known for its hardness (fig. 9).

Boxwood (*Buxus sempervirens*) is one of the hardest trees ("bone tree", "stone-tree"). In addition to being very solid, boxwood stands out for its appearance, it has a large number of pressed yellowish growth rings in different shades as if they were painted.

It is very acoustic and produces very powerful and crystal clear sound. Boxwood needs to be dried longer than other wood, six to seven years, before it is used for construction. Taking into account its characteristics, boxwood is very much respected wood, and the instruments made of it are wanted and valued (they are the most expensive ones). It is used for a variety of musical instruments, except for supeljka and other fifes, the material is indispensable for bagpipes (fig. 10). Other types of wood have been used for making supeljka: hawthorn (*Crataegus monogyna Jacq*), walnut (*Oglans regia*) and harder fruit trees (plum, pear, wild pear).

Reed is also the material suitable for making of supeljka. It almost has, by its natural

construction, the final form of the instrument. By piercing the longitudinal hole and opening playing holes, one can get material for making fife. Reed is one of the ancient materials used for making of fifes. This is confirmed by different national traditions, from Greek mythology to people's stories from our areas. There is an interesting story that can be found in many different forms in many nations, the story "The Goat's Ears of the Emperor Trojan. "In fact, Emperor Trajan kept secret his anomaly, goat's ears, but the hairdresses discovered it when cutting his hair. The hairdresses was threatened to death to keep this a secret, and as he could not keep it for himself, he leaned over the well and shouted "The Emperor Trojan has goat's ears." After that a cane grew up from the well and someone used it to make a fife. When played, the fife revealed the emperor's secret (This story exists in several versions, in one version, the secret is entrusted to a hole, from which ashwood grew later. The ashwood was used for making fife, etc...) (fig. 11).

Bone is probably one of the most ancient materials that man ever used for different needs, from tools, weapons and items for everyday use, to music intrumenats. To this day, bone is used for producing parts or entire musical instruments (keel and horses with strings, keys on the piano, pick, marquetry - ornaments, fifes). By its shape, bone already reminds us of fife, and for people it has had mystic importance, it is thought to carry the energy of the animal it belonged to. It is known that supeljkas used to be made of eagle bones, of thigh or wing bone. Eagle is a proud bird that flies so high and because of its traits it has become an important symbol, a fife made of its bones was much appreciated.

Fifes made of bones are made as follows: the bone is first cleaned of flesh, and then well boiled, which separates all softer parts and the bone itself is disinfected. After that, the hot iron is used for making holes. The finishing that ensues refers to the sharpening of the upper edge - mouthpiece, outside processing and final refinement of the diameter of holes - the so-called "tuning of supeljka. The fife has a natural length of the bone which is not reduced.

Horn also belongs to a group of materials that have been used for ages for different human needs. Symbolism of a horn is well known in all traditions of the world; horn is a symbol of victory and freedom Different types of fifes have been made of horns, as well as some parts of music instruments, protective rings on the flute and bagpipes, ornaments - trim, keel, horses, pick, etc. In our country the most spread was the usage of bovine horns, from old autochthonic breeds, whose horns were more quality - hard and endurable. The fife is made of horn as follows: the horn is first boiled in water for two to three hours, taking into account that heat should evenly increase to preserve the structure and its subsequent processing and durability. Boiling the horn cleanes the dirt off and softens the bone which enables the straightening. After straightening, the horn is drilled, and laminated on the outside. It is important that the basic shape of the fife made of horn is achieved while the horn is still warm (straightening, drilling and thinning), while the finishing can be done later.

Metal pipes have been used for making supeljkas (and kavals) for more than hundred fifty years. The convenience of the metal pipe is twofold. The material is already in the form of tubes with the required internal diameter and thickness of the wall, so it is only needed to cut

to length and drill playing holes. Metal pipe is resistant to physical damages and atmospheric influences - humidity and temperature. The disadvantages of metal pipes are heavyness, the need for appropriate tools for drilling holes and the fact that the material is cold metal, which is awkward for the player. The first flutes made of metal pipes were probably made of rifle pipe. In the late 19th century in the Ottoman Empire the rifles made by the Italian company Martini-Henry were much spread. These rifles had the pipes with slightly thicker walls and therefore were convenient for making fifes. ***Plastic pipes- the newest material for making supeljka***. They are good because in a short time and using only simple tools, just by piercing several holes, a fife for beginners can be made and it can be used for learning how to play, while acoustic and esthetic values of such instruments are in the second plan.

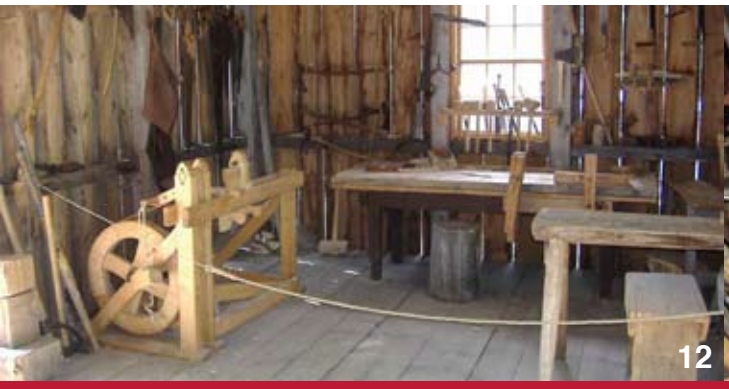
Supeljkas made of plastic pipes are used in the course as a teaching tool. Namely, over the course of making wooden supeljkas, daily training on playing plastic supeljkas are conducted. The goal is to educate each student till the end of the course how to play on the wooded supelka made during the same course.

Material for final finishing – for decorating supeljkas, additional material, inlay, rings and incrustations are seldom used. However there are some examples of ornaments made from additional material and they are most often carvings filled in by melted lead, which are, when cooled and hardened embellished and adjusted to the surrounding wooden surface. It is said that in some areas fifes were decorated by silver (!?))

Fat and oil, depending on the environment and possibilities, have been traditionally used for protecting instruments. In some societies instruments were held after production in impregnating medium, and this medium could have been heated. The time of keeping instruments in the impregnator also varies from master to master.

TECHNIQUES AND TOOLS

With the development of technologies and tools, the techniques of making musical instruments also developed. Until the twentieth century, our areas, being Turkish provinces, were very slowly developing, if at all. This applies to tools used for making musical instruments, as well as to the method of making, and the theoretical knowledge of acoustics. With social progress in the twentieth century, there was a sudden development and construction of musical intruments. This is the result of both technological development and the use of better tools and methods of making, and the higher expectations from both musicians and instruments - in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terms of the quality of instruments, tone color, intonation accuracy, durability and aesthetics

In light of the above said the tools and methods used in the past can be divided as follows - inherited tools and methods and tools and methods used in modern times.

Techniques and tools used in the past (legacy)

In the past few, available at the time, tools were used (fig.12). These were mainly hand, forged tools, of medium quality, sharpness and durability. Foot powered lathe (metal and drebonk make) was the only powered tool (fig.13). Therefore the fact that craftsmen were making important instruments with such scarce tools is worth admiration.

Some of the tools used in the past are:

Hand auger - drill used to manually drill internal, longitudinal playing holes,

Zig - a javelin shaped pole, which was set on fire and then used for piercing longitudinal hole or playing holes,

Knife - was used for trimming playing holes as well as for sharpening upper playing border (mouthpiece)

Cornel branch - (or other thin piece of hard wood) used for internal processing of supeljka, to remove irregularities caused by drilling

Scrape - metal or glass tile used to scrape the outer surface of supeljka

Maklica - a knife with handles on both sides of the blade, used for the outer wood thinning

After processing with tools supeljka was being protected- impregnated. Impregnation of the instrument is a very important point, as it protects the wood from moisture and changing weather conditions, partly because of acoustics. The only way of impregnating supeljka in the past was greasing, by fat or oil.

Techniques and tools used in modern times

In more recent historical period there were craftsmen - makers of instruments, who were only doing this and who were serious in studying and making the instruments, and even more who were making them in large numbers, which enabled the development and improvement. On the other hand, along with that, the practice of having one craftsman in almost every village, making instruments for him or neighbors, gradually disappears. In modern times the


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following tools and machines are coming into use (electricity powered):

Automatic lathe	machine o n which the internal whole is drilled and external processing is almost the ultimate measure
Radial drilling machine	machine for drilling the playing holes
Circular-saw	a machine for cutting pieces of wood
Diht-abrihter	machine for thinning the wood

Manual tools used for making fifes are also sophisticated, and today we have quality, sharpenable and durable tools which are suitable for work. With the introduction of emery both external and internal finishing of the instrument has reached a very high level. There is a special technique for the thermal preparation or processing of wood, in water or oil, as a preparation for straightening the wood, or its physical improvements in order to get rid of the stresses generated during drying. In addition, impregnation of instruments has been developed, which requires equipment for preparation of different coatings (resin or wax), and soaking of wood in them, while they are hot.

METHODOLOGY OF MAKING

Tree cutting is the first phase in the making of each instrument. The cutting is done before winter, when the tree stops soaking all juices from the soil in big quantities. People say that the wood has calmed down. This is important because of smaller amounts of water present at the time in the wood, which will shorten the drying time. The tree cut between spring and autumn is full of water, so it cracks when dried.

Drying of wood is second and very important phase in making the instrument. Generally, drying should be as long and as even as possible. Through even drying a material with less internal tensions, made by uneven drying of different parts of the crosscutting, is obtained. Secondly, in the longitudinal direction of the tree there are pipes and canals through which the juices travelled from root to branches. Those canals should shrink in time and if possible close completely, in order to get more compressed and thicker structure (necessary for acoustics). It takes time for the canals to get closed in the tree. Drying should last as long as possible, dry wood plays, wet wood does not play, and will break.

Conclusion: wood dried in kilns is not good for instruments. Wood dried in the shade, by ventilation for years is good for instruments.


18a


18b

Choosing of wood for fifes is done by the craftsman based on experience according to the appearance of the wood (pattern, regularity and density of growth rings) and echo after knocking it. Today there are manual meters of humidity, as well as the meters of the sound propagation speed, which facilitates the choice to a great extent.

Cutting according predimensions is done before piercing. The length of pieces into which the wood is cut is somewhat longer than the final length of the instrument so that the final dimension is achieved by shortening in the later phase of supeljka making. The work principle "according to pre-dimension" is the strategy for making the instrument because as long as we are on the side of excess of material, by shortening or removing the material we can come to an end - appropriate measure. On the other hand, if you overdo the shortening or thinning of material, there is a mistake that can not be corrected (Fig. 14).

Piercing of wood is a procedure of opening the inside, longitudinal hole in supeljka (Fig. 15). When drilling, it is important to determine the appropriate course of passing the drills through the wood. Specifically, a piece of wood shaped as a roller can be drilled from either direction. However, the result of drilling will not be the same in both cases. When the wood is drilled in a direction that it is growing and, in the direction from root to the branches, that is in the same direction in which the juices flowed from the ground towards the leaves, you get smoother inner surface, and the drilling is carried out more easily, with less resistance when processing. In the opposite direction (from the top of the tree to root) it is difficult to drill, and you get rough, jagged inner surface and the resistance to drilling is higher. Accordingly, the direction in which the fifes are made should be the direction from root to the branches, that is, the direction in which it is blown into the instrument should be the same as the direction in which the tree grows; it is the direction in which the juices flowed through the tree - from roots to branches

Piercing can be done in two goes:

- ***Drilling of two passages*** where the first passage (piercing) is performed with a smaller diameter drill, a second pass is done by the drill of the same diameter as the final measure. This drilling was usual in earlier times when there were no siphisticated tools and the drilling to the measure in the first passage was impossible. On the other hand drilling in two passages enabled a better quality of internal fife surface after drilling.

- ***Drilling in one passage*** is done on an automatic lathe using a drill that provides high quality treatment to a level where you get a smooth inner surface after drilling.

Rough external processing is done on a lathe, processing the material up to the pre-dimension that is to 1mm over the final thickness of the fife wall. The rough external processing can be done by manual tools out of which the most suitable is drawknife (which in the past was the most important tool for this operation) (fig.16), but it can be done by a rasp as well.

Rough internal processing is done by improvised tools for internal sanding, which is made by gluing rough surface emery paper (40-60 strength) to a cylindrical rod and wrapping in such a way that it can be inserted into the hole. By longitudinal passing of the tool through the wood and by the internal rotation the sanding of the pipe is done, which aims at polishing the inner surface or removing the irregularities caused by drilling.

Piercing of playing holes is most easily done by a radial drill, when special care should be taken that the auger is entering the material gradually, slowly. Just before piercing the hole it should slow down to avoid detaching of inner fibres in the vicinity of the holes (Fig.17)

Playing holes can be opened by a sharp knife or by inflamed baton (as it was used to be done) (fig 18a and 18b).

External adjusting to dimension is done by alternative use of scraper (metal or glass) and finer emery paper. In fact, in several passages, the scratching of the external surface of the pipe is done, where the scratching force decreases as we approach the final measure, and after each passing of scratching, the sanding is performed with finer emmery (increasingly finer sanding).

The use of scraper is very important in making the fifes because it removes a layer of material while at the same time pressing down the processed surface.

Sharpening of mouthpiece is done by cutting the upper edge of supeljka. The angle of sharpening is around 45 degrees. Some characteristics of instrument depend on the sharpening angle. So, if the mouthpiece is sharper the supeljka will have stronger and fuller sound on the lower notes, while the blowing of higher notes will be somewhat harder, and if the mouthpiece is under blunter angle the supeljka will be more suitable for higher notes (it will be faster), while lower notes will be quieter and softer.

Fine-tuning of holes is done by a very sharp knife and thin cylindrical file. The holes are opened almost to the final dimension and are chamfered downwards, that is made in the way that the diameter of the holes is bigger inside than outside, where the fingers are put.

Internal fine sanding is done in the same way as inside rough sanding, with the only difference that a finer emery paper is used (100-120 strength). After that even finer sanding can be performed using water paper (600 strength)

External fine sanding is done by using a number of finer emery papers, 100 to 400 strength. In the end, with the aim to achieve high glaze, supeljka is mildly wetted (by using a wet cloth) and sanded with water paper (1000strength).

Ornamenting of supeljka is an esthetic moment and represents a personal touch of each craftsman. Some constructors are prone to details, some to more demanding cravings, others to making relief ornaments, yet others to simpler forms of ornaments and shallower carvings. The external look of supeljka is very important, both for the player who inspired by the sound value of the instrument and by its esthetics as well, plays it and for the audience who has an opportunity to enjoy the sound and also to experience the instrument visually.

Oiling (several times) is very important. As previously pointed out, supeljka, the same as other wind instruments, is exposed not only to changeable atmospheric conditions (variation of temperature and humidity), but to the humidity that condeses inside the instrument and that is formed while playing by blowing in the air. Oiling is done externally and internally, by rubbing in the oil with a cloth externally and internally with a cloth on a rod. Different oils can be used for oiling. It is important that these oils are well absorbable by wood and that they do not go rancid, such as olive, walnut and hazelnut oil.

Varnishing is a process (that can and but doesn't have to be) done by applying some kind of varnish on the instrument in order to protect the instrument from atmospheric conditions, humidity before all. The used varnishes can be different types (on the base of resin, vax, colophony) but it is important to be applied in thin layers. It should actually make a thin film of varnish which will protect but at the same time make no "acoustic ballast" (choking tons). After impregnation, external and internal sanding is done again with the finest emery paper.

Fine finishing of holes represents the final adjusting of the natural key of supeljka. It was done in the past based on hearing and with the help of a tuner or by comparing with a comparative instrument.

CONCLUSION

Supeljka is one of the oldest types of wind instruments not only in our region. Because of its simplicity and small size it has become a favorite instrument of shepherds, who always carried it with them, but they could also make it on their own. In almost every village there was once at least one man who could make better and more durable instruments which the better players - authors, folk artists were inspired to play. Such a craftsman would make all instruments in the village or the surrounding area. Although supeljka can be made in nature - improvise in a relatively short period of time (in one day), its production still requires certain knowledge and experience. This will be addressed in our course. We will use a combination of the methods of old masters and new methods and knowledge of modern producers. We will use some modern machines, but some parts we'll still make manually. It will take more time than if using an automatic lathe. However, through "hands on" approach we are getting familiar with wood, we will feel its hardness, feel that it resists the treatment, both in longitudinal and in transverse direction, we will feel, how it smells, how "plastic" and how "fat" under tools it is, is how it sounds while being made, and when the instrument is finished and jetnot impregnated, and that eventually, when fully completed.

One should know that every instrument and even supeljka, when being palyed is getting better and better, "the instrument is being tuned ...". This is a consequence of the subsequent drying of wood which makes it even more acoustic, but even more thanks to another process. Namely, when the instrument is fully completed, it is very important to play it to ensure that within a few months (in some instruments even a few years or decades!) played out. What does this mean? Serious scientific papers on the subject seems lack, but all craftsmans agree there is such thing called playing out the wood. One explanation is this: a new material changes when intensively played by the effects of sound frequencies changes occur in a tree at the micro level (the "adjustment, settlement, fixing the material" - what actually are these concepts is an interesting question) that lead to greater ability of wood to continue to respond to the incentives under the influence that led to changes in wood - the "maturity".

All these are experiences and impressions to be tasted and the one that tastes them once understands what is the privilege and pleasure of making instruments. The story of how the vast majority of instruments makers became what they are is well known. When asked how

they became popular among the instrument makers, most of them give more or less the same answer: "I just wanted to try something a little ... and then became infatuated for quite some timewent ...". A witness to this story is a signatory of these lines, whotried 15 years ago just making one instrument!

Glossary

Acoustics	acoustic properties of materials, the science of sound
Vibrancy	acoustic properties, the material's ability to respond to excite the sound, the ratio of the propagation of sound through the material and its density - specific speed of sound through the material
Duduk	flute, long flute, synonymous with the flute
Drebonk	lathe (matkap), wood lathe on the foot-operated
Ezgija	(Turkish) music, inprovisation on supeljka (or other instrument)
Stamp	tool, a long rod with a sharpened spear-shapedtop
Kaval	playing without a mouthpiece (hollow tube) length 620-800mm long šupeljka
Maklica	big knife with handles on both sides of the blade
Matkap	lathe (see drebonk)
Ney	hollow reed flute, great length, according to tradition, it is considered to have been invented by the great Sufi poet al-Rumi (maybe only perfected, developed), now occurs in the traditions of several nations of the Mediterranean
Mouth piece	the upper part which produces sound; the supeljka is the sharpened border of a hollow pipe
Rasp	rasp for wood, rough and sharp tools for removing more layers of material
Svorce	fife, supeljka
Drill	used to drill holes inside pipes
Signal melodies	ringing tones playd on supeljka to lead the flock melodies for comunication with distant friends or pastors
Texture	growth rings layout and colors of wood, which can be seen after finishing
Tuning	in craftsmen , jargon refers to the final, fine processing of playing holes and in terms of shape, but more importantly in terms of intonation accuracy
Flogera	(Greek) hollow pipes in Greece, Greek šupeljka
Fife	Flute played with a mouthpiece; newer name, synonymous with the flute, duduk, trill

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