

ARCHITECTURE

CONSTRUCTION TECHNOLOGY OF UKRAINIAN NATIONAL HOUSING (PRYDNIPROVSK REGION IS AS AN EXAMPLE)

EYVSEYEVA G. P., *Dr. Sc. (Publ. administer.), Prof.*

The department of Ukrainian studies, State Higher Educational Establishment «Prydniprov's'ka State Academy of Civil Engineering and Architecture», 24-A Chernyshevsky str., Dnipropetrovsk 49600, Ukraine, phone: 38 (0562) 46-94-98, e-mail: evseeva@i.ua, ORCID ID: 0000-0001-9207-6333

Abstract. Problem statement. Nowadays it is difficult to see a typical, old peasant house, or different types of national confident buildings. It will take a little time and some monuments of national architecture will be difficult to find. Meanwhile, rural housing was the most massive object of traditional construction. It embodies the best achievements and experience of national architects; it is of great value for the history of Ukrainian culture, history of Ukrainian art, architecture and ethnography, sustainable construction. National art of peasant house construction of Prydniprovsk region of Ukraine, is multidimensional space and time in an array of hand-made Ukrainian art is a national architecture, its decoration, clothing filling of the interior of the house and estate, as well as plastic and spatial formation, determining loci ritual of family life of Ukrainian village since the ancient times to the present. **Analysis of publications.** The first publications about the Ukrainian national housing, was made in the late nineteenth - early twentieth century. These were the works of ethnographers and historians M.Sumtsova [17] and D. Bagaliya [1-4], G.Lukomskogo a little [12]. B. Kharuzin's work is interesting in the context of our study .[19]. The interesting materials were found by us in the series of publications that have appeared in the end of XIX and beginning of XX centuries and are associated with vital trend to build fire-resistant housing, and ukrainian peasant house was such kind of housing. "Nowadays such kind of peasant houses and storages are put because they cheap, strong and good and the most important is to be resistant to fire. Houses with brick and stone trying to be built by reach people, and houses with the clay and saman are built by poor people,they are elegant, strong, cheap long-existed and non-flammable " that is stated in the foreword to a small edition by I. Ulashivsky "Saman building" [18]. A small booklet " Valkovi Building (with 20 figures into text). F.S. Dudko also describes in detail tehnology of ukrainian peasant houses construction as the safest and the cleanest houses of present. In the 70th of the XX century, works began to appear devoted to the study of nation architecture in Ukraine. The features of construction of one or another region, the types of peasant houses, their interior; construction of farm buildings, equipping of the yard were considered in this work. Among them A. Danyluk "Closed yards in Polesie" [6-7], A. Danyluk and M. Shpak "Traditional and new in boikivskyi housing construction" [8], M. Strunka "Ukrainian national housing of Mykolaivshchina" [16], M. Manurevich "Gagauz nation housing..."[14], Z. Petrova "Rural houses in the Carpathians" [15] and others [11; 13]. The purpose and the main directions of our research is to study the complex technology of the walls construction of the Ukrainians' national housing of Middle and Lower Naddnpirianshchyny of Ukraine (of Prydniprovsk region) of the end of XIX and middle of the XX century, as the Dnipropetrovsk region belongs to this historical and geographical, industrial and economic region.

Keywords: saman, rolls, pise-walled house, clay-moulded house

ТЕХНОЛОГІЇ ВИВЕДЕННЯ СТІН УКРАЇНСЬКОГО НАРОДНОГО ЖИТЛА (НА ПРИКЛАДІ ПРИДНІПРОВСЬКОГО РЕГІОНУ)

ЄВСЄЄВА Г. П., *д. н. управ., проф.*

Кафедра українознавства, Державний вищий навчальний заклад «Придніпровська державна академія будівництва та архітектури», вул. Чернишевського, 24-а, 49600, Дніпропетровськ, Україна, тел. +38 (0562) 46-94-98, e-mail: evseeva@i.ua, ORCID ID: 0000-0001-9207-6333

Анотація. Постановка проблеми. Уже сьогодні по всій території України не часто можна зустріти типову, стару хату, той чи інший тип народних господарчих споруд. Мине небагато часу і окремі пам'ятки народної архітектури важко буде знайти. Між тим, сільське житло було найбільш масовим об'єктом народного будівництва. У ньому втілені кращі надбання і досвід народних зодчих, воно становить велику цінність для історії культури українського народу, історії українського мистецтва, архітектури та етнографії, екобудівництва. Народне мистецтво хатобудування Наддніпрянської України – багатомірний у просторі й часі масив українського рукотворного мистецтва – являє собою народну архітектуру, її оздобу, речове наповнення інтер'єру дому та садиби, а також пластично-просторові утворення, що визначають ритуальні локуси родинно життя українського села від найдавніших часів до сьогодення. **Аналіз публікацій.** Перші

фундаментальні спроби дослідити народну архітектуру, зокрема українське народне житло, були зроблені в кінці XIX – на початку XX століття. Це були праці етнографів та істориків М.Сумцова [17] та Д. Багалія [14–4], у певній мірі – Г.Лукомського [12]. У розрізі нашого дослідження цікавою є робота В. Харузіна [19]. Цікаві матеріали знаходимо в серії публікацій, які з'явилися в кінці XIX на поч. XX століття і пов'язані з життєво необхідною тенденцією будувати вогнестійке житло, яким власне була українська хата. «Скрізь тепер намагаються ставити такі хати та комори, щоб і дешеві були, й міцні, і ловкі, а саме головне – щоб не піддавалися так «червоному півневі». Заохочуються ставити – хто заможніший – будівлі з цегли та каменю, а хто убогіший, той до глиняних, саманних береться, – вони чепурні, міцні, дешеві, довговічні й негорючі», – зазначається в передмові до невеликого видання І. Улашівського «Саманні будівлі» [18]. Невеличка брошура «Вальковия постройки (съ 20 рисунками въ текстъ)» Ф. С. Дудко також детально описує технологію будовання української хати як найбезпечнішого та найчистішого (в значенні екологічного Г. С.) житла цього часу [10].

У 70-ті роки XX ст. почали з'являтися праці, присвячені вивченню народного будівництва в Україні. Це роботи, в яких розглядалися особливості забудови того чи іншого регіону, типи хат, їх інтер'єр; будівництво господарчих споруд, облаштування двору. Серед них А. Данилюк «Замкнені двори на Поліссі» [6–7], А. Данилюк та М. Шпак «Традиційне і нове в бойківському житловому будівництві» [8], М. Струнка «Українське народне житло Миколаївщини» [16], М. Мануревич «Народное жилище гагаузов...» [14], З. Петрова Сельские жилища дома в Карпатах [15] та інші [11; 13]. Мета й основні напрямки нашого дослідження полягає у комплексному вивченні технології виведення стін народного житла українців Середньої та Нижньої Наддніпрянщини України (Придніпровського регіону) кінця XIX - середини XX ст., оскільки Дніпропетровщина належить саме до цього історико-географічного та промислово-економічного регіону.

Ключові слова: саман, вальки, глинобитна хата, глинолита хата

ТЕХНОЛОГИИ ВЫВЕДЕНИЯ СТЕН УКРАИНСКОГО НАРОДНОГО ЖИЛЬЯ (НА ПРИМЕРЕ ПРИДНЕПРОВСКОГО РЕГИОНА)

ЕВСЕЄВА Г.П. *д. н. госуд. управл., проф.*

Кафедра украиноведения, Государственное высшее учебное заведение «Приднепровская государственная академия строительства и архитектуры», ул. Чернышевского, 24-а, 49600, Днепропетровск, Украина, тел. +38 (0562) 46-94-98, e-mail: evseeva@i.ua, ORCID ID: 0000-0001-9207-6333

Аннотация. Постановка проблемы. Уже сегодня по всей территории Украины не часто можно встретить типичную, старую хату, тот или другой тип народных хозяйственных сооружений. Минует немного время и отдельные достопримечательности народной архитектуры трудно будет найти. Между тем, сельское жилье было наиболее массовым объектом народного строительства. В нем воплощены лучшие приобретения и опыт народных зодчих, оно представляет большую ценность для истории культуры украинского народа, истории украинского искусства, архитектуры и этнографии, экостроительства. Народное архитектурное искусство Украины Надднєпряньщини многомерный в пространстве и времени массив украинского рукотворного искусства; являет собой народную архитектуру, ее убранства, вещественное наполнение интерьера дома и усадьбы, а также пластично-пространственные образования, которые определяют ритуальные локусы семейной жизни украинского села от самых давних времен до нынешнего времени. **Анализ публикаций.** Первые публикации об украинском народном жилье, были сделаны в конце XIX - в начале XX века. Это были труды этнографов и историков М. Сумцова [17] и Д. Багалія [14–4], в определенной мере - Г. Лукомського [12]. В разрезе нашего исследования интересной является работа В. Харузіна [19]. Интересные материалы находим в серии публикаций, которые появились в конце XIX начале. XX века и связаны с жизненно необходимой тенденцией строить огнестойкое жилье, которым собственно была украинская хата. "Везде теперь пытаются ставить такие хаты и кладовые, чтобы и дешевые были, и крепкие, и хорошие, а главное - чтобы не поддавались "красному петуху". Поощряются ставить - кто более состоятельный - здания из кирпича и камня, а кто более убог, тот к глиняным, самановым берется, - они нарядны, крепки, дешевы, долговечны и негорючи", - отмечается в предисловии к небольшому изданию І. Улашівського "Самановые здания" [18]. Небольшая брошюра "Вальковия постройки (съ 20 рисунками въ текстъ)" Ф. С. Дудко также описывает технологию. В 70-ые годы XX ст. начали появляться труды, посвященные изучению народного строительства в Украине. Это работы, в которых рассматривались особенности застройки того или другого региона, типы хат, их интерьер; строительство хозяйственных сооружений, обустройства двора. Среди них А. Данилюк "Замкнутые двory на Полесье" [6–7], А. Данилюк и М. Шпак "Традиционное и новое в бойковском жилищном строительстве" [8], М. Струнка "Украинское народное жилье Николаевщины" [16], М. Мануревич "Народное жилище гагаузов". [14], З. Петрова «Сельские жилища дома в Карпатах» [15] и другие [11; 13]. Цель и основные направления нашего исследования заключается в комплексном изучении технологии возведения стен народного жилья украинцев Средней и Нижней Надднєпряньщини Украины (Приднепровского региона) конца XIX - середины XX ст., поскольку Днепропетровщина принадлежит именно к этому историко-географическому и промышленно-экономическому региону.

Ключевые слова: саман, вальки, глинобитная хата, глинолитая хата

Problem statement. Nowadays it is difficult to see a typical, old peasant house, or different types of national confident buildings. It will take a little time and some monuments of national architecture will be difficult to find. Meanwhile, rural housing was the most massive object of traditional construction. It embodies the best achievements and experience of national architects; it is of great value for the history of Ukrainian culture, history of Ukrainian art, architecture and ethnography, sustainable construction. National art of peasant house construction of Prydniprovsk region of Ukraine, is multidimensional space and time in an array of hand-made Ukrainian art is a national architecture, its decoration, clothing filling of the interior of the house and estate, as well as plastic and spatial formation, determining loci ritual of family life of Ukrainian village since the ancient times to the present.

Analysis of publications.

Presenting main material. In the Prydniprovsk region a tradition of different housing technologies became traditional during the centuries, but among the large variety, distinguished which required for its implementation the smallest quantity of timber. This was crucial to the treeless or little wooded rural Ukraine territories and Dnipropetrovsk region territory belongs to them. territory of the Dnipropetrovsk region. On the territory of the region the construction of housing was given with the following technologies:

Saman peasant house. Saman production technology. **Saman** is a small block of clay and

straw mass. As a construction material it is widely used in national housing of southern areas and western part of the forest-steppe zone of Ukraine. The main advantage of saman wall over other construction with clay is that they quickly dries out and give a relatively small subsidence. Ease of this design is that preform of saman can be done gradually, pre-dry it. A major drawback of clay walls, including with saman, is that under the influence of atmospheric moisture they become humid, thus they get very significant deformation. As noted by some studies [114] to avoid this, in the southern walls of saman after their subsidence, it is veneered often with brick, sometimes it is only the lower part of the wall (to the level of windows), and sometimes it is the whole wall. Typically, houses with sush walls have been warmer and stronger, but also more expensive because they were built mostly by wealthy farmers.

For production of saman with clay the greasy, sticky, plastic clay are taken (plasticity and determine the fat content, see Part 3) because the clay dries crack, it added straw. Specifically breeze straw (threshing or chopped straw) of different lengths from 10 sm to 20-25 sm. This straw strengthens (binding) clay solution, especially for broken efforts. If the straw uses from 2 sm to 5 sm (chaff) so, the solution loses its binding properties.

Straw may be wheat, barley, rye, and even flax or hemp. If in the economy there was not thrashing straw, it crushed on special equipment, it is straw-mill. (Fig. 4.5).



Fig. 4.5. Straw-mill (Drawn by Oksana Yakovenko, master of architecture).

Adding straw to clay reduces the thermal conductivity of clay mud wall that for housing is paramount. However, a large amount of straw lead to an increase subsidence of wall, makes the walls loose, accessible to rodents

that are too dangerous for rural areas. Value of clay and straw clearly no one defines as the ratio depends on the quality of clay and straw, and it is in every village and even in yard is own. But generalizing heard and seen, in our

opinion, the straw can be up to 25% of the volume of clay, or 16 -20 kg per 1m³ of clay.

There are several successive operations in the production of saman:

- 1) preparing of clay solution;
- 2) mixing of clay solution;
- 3) production (formation) of saman;
- 4) drying of saman.

The first stage begins in the spring. Preformed clay in the autumn (see part 3) of early spring start to soak. This is done either in current or in holes (Fig. 4. 6). On threshing-floor the clay is put by layer of 25 - 35 sm of thick with rollers on the edges to resist water. Then pour water on the clay at the rate of 0.75 bucket of water in a bucket of clay by breaking down large lumps of clay. At the threshing-floor mostly clay soaked with a small amount of work: construction of barn, cellar, chicken coop and etc.. With a significant amount of work, such as building houses, barns, stables, etc., soaking the clay did in the pits. Soaking pit for clay was made by depth of 60 to 80 sm with a radius of 3 m to 4 m (it depended on the amount of work). Pit was dug round, because this is the best way to mix clay in pit by all sides, in addition to the round pit there is more space for backfilling clay. It is easier to take ready solution from round pit. The edges or walls of such pits were entrenched with boards, to avoid slipping of these walls. Clay is put

with layers into a pit: a layer of clay

By thickness of 20 - 25 sm, layer of straw, filling with water. Having filled the pit, water is poured to cover the clay, the top covered with a thick layer of straw and left for 3-6 days. The pit with of soaked clay and straw called Gras. It is important to remember that soaked the clay never stirred during soaking. Because of it clay loses its quality, because clay lumps during mixing slip and then are out of further slaking.

The second stage is mixing clay. Mixing clay is one of the most important operations of clay preparation solution, thus as clay is mixed, the quality of the solution, its homogeneity depends on it, and the strength and purity of saman.

When the amount of clay solution is small, it is kneaded with your hands or feet. This work is done by women. The skills of women of dough kneading are useful in the kneading of clay. Only women's hands or feet are able to qualitatively knead clay. With a large amount of construction work a clay solution then is mixed by using animals, usually horses. Wrought iron horse well stirred clay. In the old days used traction force oxen. When is kneaded clay by animals and also they are under control by, their riding. This work was performed with great pleasure by teenagers who rides well even without bareback.

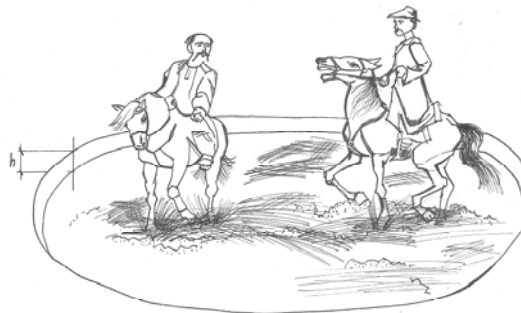


Fig. 4.6. Kneading of clay by horses into the pit (h = 70-80 sm) (Drawn by Oleg Tokarev, architect student).

Regardless of the method of kneading clay, clay is kneaded until it becomes completely homogeneous and soft dough. Kneading technology is that the first clay is kneaded then straw is added to it. Readiness of solution is determined with help of visual inspection: ready mixture does not stick to hands and feet during stirring. Or quality kneaded of clay can

be set as follows: clod of clay is taken and cut with a knife or spade, and if a cut across the surface has the same color, moisture, viscosity and the same allocation of straw, so clay and straw solution is ready. Ready to use solution covered with matting, and straw so clay do not dry up.

The third stage of production of saman.

Three ways of making saman has been forming for the long centuries among Ukrainian, that is hand, heel and machining methods. Workplace to form saman is near the pit. Formation conducted at the level of planned and sprinkled with straw place (estrus) When hand-made saman "moulder" (the same woman who

kneads clay) separates from clay and straw mass of a piece of clay straw mixture, plunges it into the water, and with the force throws soaked in water form, which is placed on a thin layer of straw. The form for making of saman made as a box without a bottom from 19 mm planks on one or two samans (Fig. 4.7.).

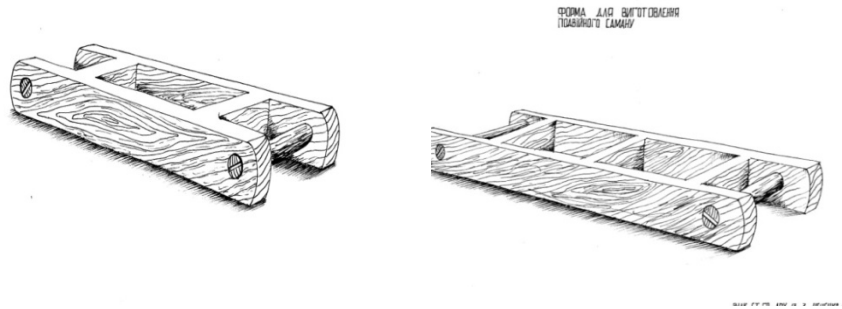


Fig. 4.7. Forms for production of saman (for one and two samans)

Then clay and straw solution is rammed down with fists in the form so as to fill completely the whole form. Then it is smoothed on surface by both hands (Fig. 4.8.), clearing the surplus of top of wooden rolling pin or by hand.

Then carefully the form is removed with the cuttings and on the chute is put the formed saman. Next form rearrange to another place, and the process begins all over again.



Photo 4.8. Formation of saman blocks.

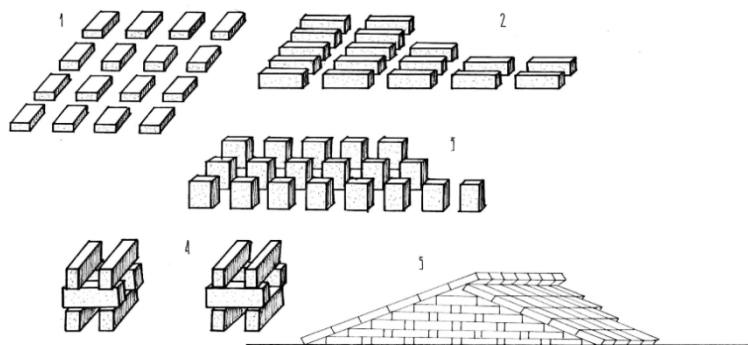


Fig.4.9. The procedure for drying of saman: 1) by flat; 2) on the edge; 3) on a threshing - floor; 4) in the cell; 5) in the stack (Drawn by M. Ershov, student).

Production of saman of heel method, clay and straw solution is trampled down with feet, and placing the dampened shape on a thin layer of straw. As in the hand and heel methods, distances between the ready saman should be 10 - 20 cm in the transverse direction and 4.10 cm in longitudinal direction. One "moulder" with

help of assistant can be formed during daylight hours from 400 to 600 pieces of saman.

Some farmers said that the mass post-war reconstruction of villages (50-60 years of the twentieth century.) there were machines for the formation of saman. Production of saman with them is called machine-way. Description of the

drawings the machine described in the literature [114, p.17; 57 p.14]. The advantage of machine production is that during the day "moulder" with an assistant can be molded from 900 to 1000 pieces of saman. Making saman in any

manner described above, it is necessary to remember that the form must be filled with a mixture in a single step, as another part of mixture and for further drying easily fallen off and it will reduce the quality of saman.



Fig. 10.4. Drying of saman (by stacks and by expanded).

The fourth stage is drying saman. In hot and windy weather adobe covered with straw matting, etc., avoiding rapid drying or over drying. After 2-3 days saman dries and then it is turned over on a long edge, and then after a while is put on the short edge (Figure 4. 9); When saman well dries and hardens, it is made up in the box, and then in stacks, leaving gaps between saman. Stack is covered from getting wet in the rain, or it is put under cover. As such, saman finally dried 10-15 days (Fig. 4.10). In hot weather saman is drying faster and ready within 7 - 10 days. In some villages there was a tradition of smoking saman. For this stack with saman lay round with straw and scorch. There was a belief that the peasant house built with smoking saman is "cleaner" (more ecological, it lacks the unhealthy energy, G.Ye.). The owner ensures that the dried saman had right surfaces and edges, and in the hacking is the same color. The absolutely dried saman, can be stored for several years, becoming stronger. Saman of the best quality meet the following requirements:

While broking down on the ground from a height of 1.5 - 1.7 m (human growth) saman should not break;

While hitting with an ax handle on saman surface should remain bright, shallow dent;

Quality of saman can be hacked and hewed with an ax, while saman is not cracking

Saman which was put in water should not

lose saman rectangular form for 2 hours and should not disintegrate earlier than 8 hours;

Saman should not fall apart into pieces when the nail is hit in it with length of 150-180 mm.

Saman should be light in weight.

Thickness of saman wall determined by the purpose and size of the buildings. People practice, based on climatic conditions of Prydniprovsk region of Ukraine confirms the need for residential buildings (houses) of 50 cm is for external walls and 35 cm is for interior walls and for little load wall. According to this the most common saman size is $33 \times 16 \times 12$ cm, but there are other dimensions. The best size is where length is $\frac{1}{4}$ larger than the width and thickness equal to half of the width. This size is advantageous when walling up. Saman peasant house is walled up in the basement (see. Section 4.1.).

Construction technology of clay walls of peasant house. For the construction of peasant houses with clay walls need wood material for scaffolding. For medium-sized peasant houses of 10×6 meters with one capital partition need: rod of 22 pairs, of each length of about 6 meters and a thickness of 13 - 15 cm; props for foundations to 18 pairs, the length is about 4 m; 6 m boards are 14 pieces. The size of the boards should be approximately as follows: 4-6 cm thick and 22 cm wide. Boards preferably should be cleaned with gamble (plane). This purifica-

tion greatly affects on the improvement work on construction of the walls, and then the board can be used for its intended purpose.

Picking up the wood for work, the owner starts to prepare a solution. In the production of a clay solution for pouring the walls, in front of the building, two round pits for a clay solution are dug out. Clay is filled with layers had been freezing in fall, then is poured with water in the spring. The solution was stirred in the same manner as for saman (i.e., feet or horses) only without straw. The clay is kneaded sparsely, "as the thick cream." According to this the clay solution is good: rye or wheat straw is taken with length of the elbow or two hands, put it down to the solution, and if the straw immediately leans over and lay down on the surface of the solution, so the solution is liquid and heterogeneous, if it stands without swaying, so the solution is thick and when the straw slopes on the side, but does not fall, it is a good solution"; "A good solution when the bucket is colored with it and does not flow from the bucket walls or clumps stick to the walls." Quality of solution for the strength of the building is of great importance. For example, "when the solution is liquid, so during trampling of the straw in troughs, the solution will flow down and then the straw is not enough saturated and conversely, when the clay solution is thick, in the troughs the layer of clay and straw will lie, and in both cases the strength of the walls will be small and will be a good shelter for mice". To make sure, whether the solution is made in right way you should, look at the wall, when the shape is lifted and you will not see the individual layers of straw or clay, then touch with hand and, when the whole mass will be the same, it shows that the solution is made correctly.

After the solution is prepared the walls will begin to be poured. Pour the wall as follows: "at first soft straw is put, an even layer of about 8-10 sm of thickness over the entire wall in ready forms then clay solution is filled with and immediately is trampled down with feet until the top of straw does not act bubbles clay solution. In, to be equal and sharp, in the corners of the sides it is necessary not to trample with feet, and a stake or a special tamper (Figure 4.11).

Having trampled a good one layer of straw, the second layer is put, fill it and trample over again until the entire form is filled to edge of shields. To give greater strength to walls and solidity, better each time over filling out forms just across the wall make it with a wooden club (rammer Figure 4.11), and after that lift up the molding board".

Molding boards must be lifted carefully and the job is done by entrusted experienced master, who generally directs the entire work, in addition, several workers who tramping walls during lifting molding boards should remain on the surface of the wall, thereby not to give the opportunity to rise the top of layer of straw, that may be particularly at the edges and corners of the walls.

Forming boards lifted with lever, on a stand with notches. Molding boards is lifted as follows: enclose one end of the lever (stick or board) under molding board substitute board with cutouts, and click on the other end down. Molding board lift evenly around the walls to the same height, so they covered with lower edges one third of the width of the stuffed layer walls, or in other words the board is lifted up in the high of two-thirds of the entire width of molding boards, having lifted the molding boards, every time soil is checked with weight, so the wall should be equal".

First they poured the first layer of height of 30 - 40 sm, sometimes up to 100 sm. After its drying it shields raised to the height of the first layer and poured next. Artificial of each next wall layer after drying the previous, and so to the required height. Wooden frame inside of clay form strengthened clay wall mass, forming a solid structure of the building.

With this technology the thickness of the walls was different. At the bottom they could reach one meter and rising to be narrowed. Thickness of the lower and upper levels of the walls had a 2: 1 ratio. The interior walls of the building retained the right angle, and external were under slight slope. This design provided wall facades trapezoid shape.

Poured walls every day without a break, but after bringing to the half of wall they were been given to dry for 1-2 days and then has again continued to work through. Walls were

not poured during inclement weather (rain, etc.). In this case, when the rain was great, the walls were covered with top boards or other material not to be wet especially when the forms are not filled to overflowing mass. Spout wall to the desired height, they made it possible to dry well, then just continued other work (ceiling, roof, windows, doors, etc.).

Soil and clay technology of walls. The peasant houses or farm buildings with such walls are built with soil or clay of moisture which it usually has on the depth of 15-20 sm. Suitability of soil (any clay) determined simply, if the soil does not fall while digging pit, so soil is suitable for soil technology. Clay or soil are loosened. There is any other special preparation is required. Earth and clay are used freshly dug, old materials are not used. The material for the walls is ready. Technology of soil and clay wall are the same. Lathing is fixed of boards on foundation (as in clay walls). In lathing, earth (clay) is put by men with buckets, litter, There deploying with thin layer is 10-15 sm. The thinner the layer, the better is trampled. Trample with rammer (Fig. 4.11), made of solid and dry wood. Sometimes base of rammer is sheathed with iron.

Soil is trampled too much, so until while hitting by rammer earth or clay will give a clear sound, like the sound of hitting a tree and put layer is reduced by half. Thus construct all of the walls, the building is crammed simultane-

ously around the perimeter, leaving openings for windows and doors. The earth and clay buildings warm and dry, cheap.

They construct without water, so don't raw. Such buildings dries quickly after reconstruction, so quickly livable. This house owners can "trample" by their own, and therefore should not pay to masters.

The disadvantage of this technology is that the building needs to be perfect with trampling across the wall. If "to trample with unequal force, the walls will be thick in some places, while others will give porous cracks, and it is dangerous for strength of building". In place of porous plaster is put not well, eventually porous places can crumble, it can cause the destruction of the building. Therefore, accurate and thorough without printing the entire building will be strong. That is why the technology of soil and clay is built with small rooms (chicken coops, barns). So clay houses have some flaws, but the advantages of this forgotten technology are too much. Firstly it is, cheap. Secondly, the material is available and on its strength does not inferior either brick or concrete. Thirdly, such kind of building "breathes". So creating a comfortable environment for living and health: it is proved that the clay acts as a filter for absorbing pollutants indoors. In other words cleans the air. So in clay peasant houses feel good even those who are prone to allergies.

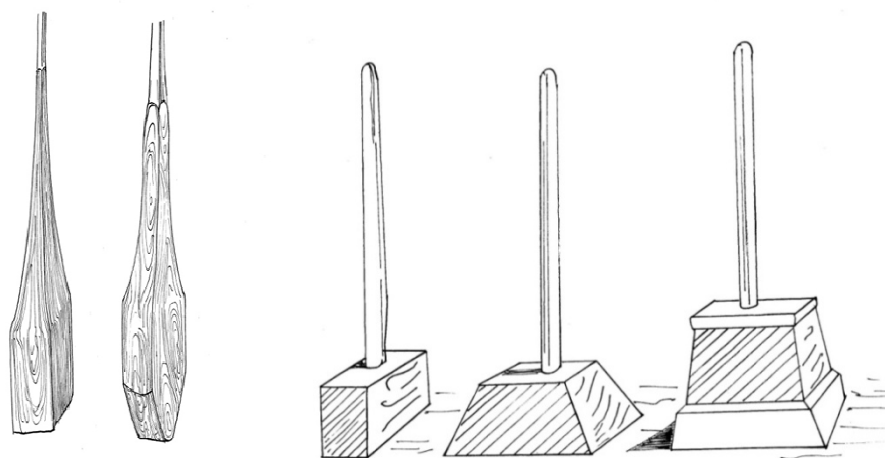


Fig. 4. 11. Wooden rammers and with metal base

Soft saman (valkovi) walls. For soft saman walls, solution is prepared as well as for saman (sometimes is called raw saman). Soft

saman is made by women kneading clay and straw solution like dough. Even clay and straw consistency similar to dough mixture. For soft

saman, straw was taken long, but the mint unlike saman. Production of it was as follows: "straw was spread out on the threshing - floor and trampled on it with help of horses until the straw would be soft" or straw - mill used (Fig. 4.5). The straw are put in sheaves around dug pit with straw and clay mixture. Women who made soft saman, stay on knee around du pit with straw and clay mixture. the ground they put straw. Taking clay and straw mixture from pit women put it on the straw and begin to knead. Soft straw is kneading until it will be plastic. The prepared soft saman men put into the prepared lathing (fig.4.12). One woman for one hour can produce 10 to 15, putting them near them. Clay soft saman walls had two design solutions that are: simple clay and soft saman and clay and soft saman "in herring bone ". In the first case used a fairly large soft saman of clay and straw mass that concluded across the walls in rows, close to each other. For the construction of walls out of soft saman "in herring bone" used soft saman of smaller size. Every layer of soft saman stacked on wall not horizontally but at an angle of 45 °, though two adjacent layers have tilt in different directions. This design of clay wall appeared in the national construction at the beginning of the XX century. and widespread from 20 - 30 years up to

50-60 years of the twentieth century. within the reconstruction of the Ukrainian village in the postwar years.

Soft saman walls of houses construct over one day, laying house ceiling beam. Traditional house measuring of 10 × 6 construct team of women who makes soft saman about 10 - 15 people, and men and adolescent boys. Home built from soft saman is warm, economical, does not require large expenditures but sometimes used instead of clay soil, so these houses were built often.

Sometimes, instead of soft saman used soft saman with adding of excrements (lympachi) The difference between soft saman with adding of excrements and soft saman was that the mixture from which made lampachi besides straw, clay (or soil) and water added organic impurities, including animal manure (dung). Often used horse dung because the horse was considered "clean" animals. In the steppe region , sheep dung is used. Technology of soft saman with adding of excrements peasant house was like a soft saman peasant house but soft saman with adding of excrements is used raw. Sometimes soft saman with adding of excrements was dried, then technology of such peasant house was like a saman house technology.

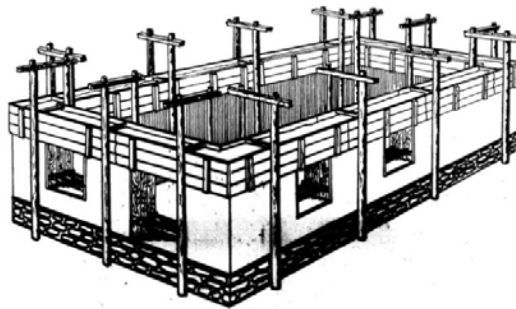


Fig. 4. 12. Lathing for clay and soft saman peasant house (Drawn by Oksana Yakovenko, master of architecture).

All clay and soil structures, which have been described above, characterized as construction almost without wood in it. It is used at these constructions not for windows and doors, only for ceilings and rafters.

In the Prydniprovsk region it were popular peasant houses on wooden frame (as a rule from waste of wood) (turluchni khaty) among peasants or peasant houses with wooden support in the corner (as a rule from good sort of

tree) (khaty na sohah) so that is framed building. This was associated with the natural and geographical conditions which housed the village. Unlike the above described technologies in peasant houses on wooden frame, wood play a great role because it is the main part of building the house, it's a frame of future peasant house. The technology of building this peasant house was in correct previous planning , choosing a place and trampling to soil of 4 wooden

support at the corners of peasant house,(it were very thick pillar) and from quite hard sort of tree (for the Prydniprovsk region , it were: oak, acacia, pine). At the top of the wooden support there was connection between them with two rows of horizontal bars or beams Bars or beams are sharpened at the end with lock and on the

board (the upper layer of tree) put the center balk, and put above ceiling the wooden overlap in “A” form for the roof. Then between wooden support are trampled wooden stakes or put transverse wooden sticks (wooden stick .Fig. 4. 13).

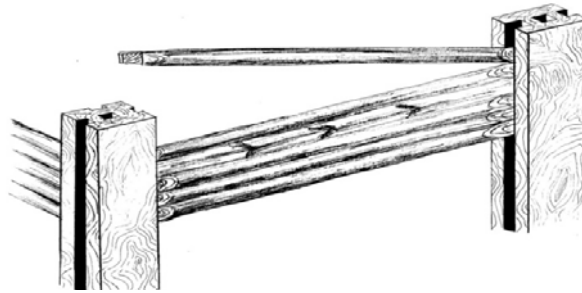


Fig. 4. 13. Inserting of wooden sticks

Further shell of the peasant house is joined to wooden stick. The shell has its own variants depending on local conditions. There are houses that often are covered with clay and straw solution. In such houses along the walls, between wooden support vertically and fairly close to each other in soil is trampled wooden stakes (often used with willow), putting in the upper end of the stakes on the board (the upper

layer of tree) of peasant house. Then the stakes thin are braided with thin vine or wheat straw or reeds (fig.4.14). In the Prydniprovsk region there are peasant houses with braided walls with one, two and three rows of netting (fig. 4.14 and fig.4.15). Sometimes two - and three-row of braiding covered with soil. Then such braided frame coated with clay plaster.

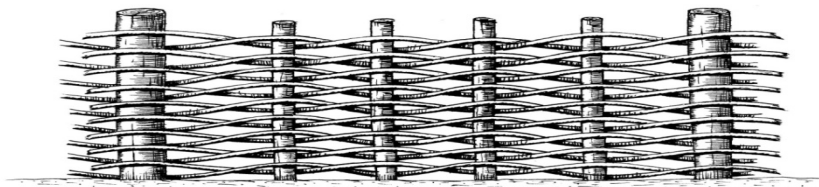


Fig. 4.14. Braided frame of peasant house

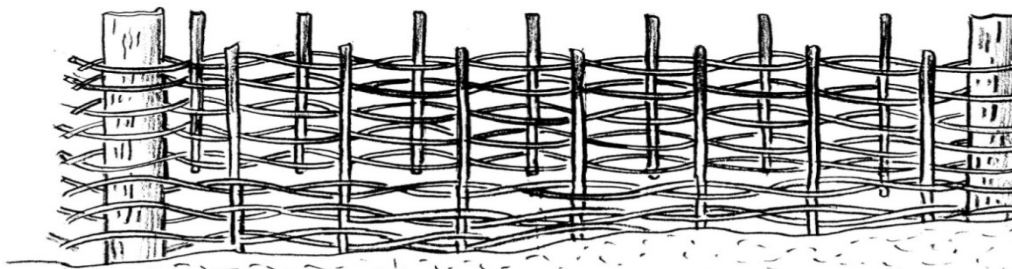


Fig. 4. 15. Two raw braiding of peasant house frame

Plaster (thick doughy solution) whirs with fists (Fig.D1.24), then tight, like smearing with less dense of solution. Then allow to dry and then whitewashed. These peasant houses are called mazanka. Peasant house – mazanka for centuries has been the traditional dwelling of central and eastern Ukraine. Mazanka is a very warm peasant house all of peasant houses which are built with clay. In the construction of mazanka was used local building materials. Mazanka is a structure that combines both comfort and genuine housing, and strength, and resistance to moisture and cold. The thickness of the walls of mazanka are from 26 to 30 sm, that equate as 120 sm of brick masonry. Advantage of mazanka is also because it dries much faster than conventional clay peasant house, it consumes less clay, that makes the construction easier and specialist should not be

there while constructing .Mazanka could be built by family own.

In villages which are located along rivers and streams, especially in the southern part of the region, the peasant house with the same frame are put with the reed or cane. Reed is bind in bundles and thin tie, both inside and outside to the wooden sticks, inserted between wooden support. Make it so that there were no gaps between the sheaves. Having tied of peasant house of two sides, it is thrown with clay and straw solution, making solution by hands (fists), then trowel. After drying whitewashed. Reed peasant house not as strong as saman or clay pouring peasant house, but cheap because have a large number of reed and ease while making aframe, they are made quickly and work is not hard.

REFERENCES

1. Bagaley D.I. *Ocherki kolonizatsii i byta stepnoy okrainy Moskovskogo gosudarstva* [Essays of colonization and life steppe outskirts of Moscow State]. Imp. o-vo istorii i drevnostey ros. pri Mosk. un-te [Society of history ancienry of Russia under Moscow university]. Moskow, 1887, 614 p. (in Russian).
2. Bagaley D.I. *Kolonizatsiya Novorossiyskogo kraia i pervyie shagi ego po puti kultury* [Colonization of the Novorossiysk territory and its first steps on the way of culture]. Kiev, 1889, 118p. (in Russian).
3. Bahaliy D.I. *Zaselelnia Pivdennoi Ukrainy (Zaporozhogo i Novorossiyskogo kraia) i pershi pochatky ii kulturnogo rozvytku* [Settling of the Southern Ukraine (Zaporozhye and Novorossiysk Territory) and the first beginnings of cultural development]. Kharkiv: Soyuz, 1920, 34p. (in Ukrainian).
4. Bahaliy D. *Istoria Slobidskoi Ukrainy* [History of Sloboda Ukraine]. Kharkiv: Osnova, 1991, 256 p. (in Ukrainian).
5. Gumilev L.N. *Geografiya etnosa i istoricheskij period* [Geography of ethnic and historical period]. Leningrad : Nauka, 1990, 279 p. (in Russian).
6. Danylyuk A.H. *Ukrayinska khata* [Ukrainian peasant house]. Kyiv: Nauk. dumka, 1991, 112 p. (in Ukrainian).
7. Danylyuk A. *Zamkneni dvory na Polissi* [Closed yard of Polesie]. *Narodna tvorchist ta etnografiia* [Folk art and ethnography]. 1975, no. 4, pp. 102–103. (in Ukrainian).
8. Danylyuk A. *Tradysyina poliska sadyba i typy ii zabudovy* [Traditional farmstead of Polesie and types of construction]. *Narodna tvorchist ta etnografiia* [Folk art and ethnography]. 1991, no. 2, pp. 53–58. (in Ukrainian).
9. Danylyuk A. and Shpak M. *Tradysyine i nove v boykivskomu zhytlovomu budivnytstvi* [Traditional and new Boyko housing]. *Narodna tvorchist ta etnografiia* [Folk art and ethnography]. 1972, no. 4, pp. 9–11. (in Ukrainian).
10. Dudko F.S. *Valkovye postroyki (s 20 risunkami v tekste)* [Valkov buildings (with 20 figures in the text)]. Kiev: *M-vo zemledeliya. Otdel sel. str-va*, 1916, 31 p. (in Russian).
11. Koliko Yu.L. *Budivnytstvo z hruntoblokiv* [Construction with soil blocks]. Kyiv, L'viv: Derzh. vyd-vo tekhn. lit., 1946. (in Ukrainian).
12. Lukomskiy V.K. *Starynni sadyby Kharkivskoi hubernii* [Ancient manors of Kharkov province]. *Z ukrayinskoï khudozhnoi spadshchyny* [From the Ukrainian artistic heritage]. Kyiv, 2004, pp. 18–154. (in Ukrainian).
13. Marzeev A.N. *Zhilishcha i sanitarnyj byt selskogo naseleniya Ukrainy* [Dwellings and sanitary way of the rural population life of Ukraine]. Kharkov : Nauch. myisl, 1927, 196 p. (in Russian).
14. Marunovich M.V. *Narodnoe zhilische gagauzov Dnestrovsko-Prutskogo mezhdurechya (XIX–nach. XX vv.) : Avtoreferat Kand* [Gagauz People's dwelling Dniester and Prut interfluve (XIX-early XX centuries: Abstract of Ph.D. dissertation)]. In-t etnografii im. N.N. Mikluho-Maklaya [Institute of Ethnography named after N.N. Mikluho-Maklai]. Kishinev, 1977, 27 p. (in Russian).
15. Petrova Z.A. *Selskie zhilye doma v Karpatah* [Rural houses in Carpathians]. Uzhgorod: Karpaty, 1972, pp. 97–100. (in Russian).
16. Strunka M.L. *Ukrayinske narodne zhytlo Mykolaiivshchyny* [Ukrainian national housing of Mykolaiv]. *Narodna tvorchist ta etnografiia* [Folk art and ethnography]. 1983, no. 2, pp. 63–67. (in Ukrainian).
17. Sumtsov M. *Slobozhane. Istoryko-etnografichna rozvidka* [Slobozhane. Historical and ethnographic intelligence]. Kharkiv: Soyuz, 1918, 240 p. (in Ukrainian).

18. Ulashkivskiy I. *Samanni budivli* [Saman buildings]. Kyiv: Rillia, 1912, 16 p. (in Ukrainian).
19. Haruzina V.N. *Zametki o krest'yanskom zhilishche v Verkhnedneprovskom uезде Ekaterislawskoj gubernii* [Notes about peasant dwelling in Verkhnedneprovsk of Ekaterislawskoy province]. Yanchuk N.A., ed. *Etnograficheskoe obozrenie, Imperatorskoe obshchestvo lyubitelej estestvoznaniya, arkheologii i etnografii (IOLEAE) pri Moskovskom universitete* [Ethnographic review, Imperial Society of Natural history experts, Archaeology and Ethnography (ISNHEAE) at the University of Moscow]. Moscow, 1905, no. 2-3, pp. 7-13. (in Russian).

ВИКОРИСТАНА ЛІТЕРАТУРА

1. Багалеї Д. І. Очерки колонизации и быта степной окраины Московского государства / Д. И. Багалеї. – Москва : Имп. о-во истории и древностей рос. при Моск. ун-те, 1887. – 614 с. : 1 л. карт.
2. Багалеї Д. І. Колонизация Новороссийского края и первые шаги его по пути культуры / Д. И. Багалеї – Киев, 1889. – 118 с.
3. Багалій Д. І. Заселення Південної України (Запорозького й Новоросійського края) і перші початки її культурного розвитку / Д. І. Багалій. – Харків : Союз, 1920. – 34 с.
4. Багалій Д. Історія Слобідської України / Д. Багалій. – Харків : Основа, 1991. – 256 с.
5. Гумилев Л. Н. География этноса и исторический период / Л. Н. Гумилев. – Ленинград : Наука, Ленинград. отд-ние, 1990. – 279 с.
6. Данилюк А. Г. Українська хата / А. Г. Данилюк. – Київ : Наук. думка, 1991. – 112 с.
7. Данилюк А. Замкнені двори на Поліссі / А. Данилюк // Народна творчість та етнографія. – 1975. – № 4. – С. 102–103.
8. Данилюк А. Традиційна поліська садиба і типи її забудови / А. Данилюк // Народна творчість та етнографія. – 1991. – № 2. – С. 53–58.
9. Данилюк А. Традиційне і нове в бойківському житловому будівництві / А. Данилюк, М. Шпак // Народна творчість та етнографія. – 1972. – № 4. – С. 9–11.
10. Дудко Ф. С. Валковые постройки (с 20 рисунками в тексте) / Ф. С. Дудко. – Киев : М-во земледелия. Отдел сел. стр-ва, 1916. – 31 с.
11. Коліко Ю. Л. Будівництво з ґрунтоблоків / Ю. Л. Коліко. – Київ ; Львів : Держ. вид-во техн. літ-ри, 1946.
12. Лукомський В. К. Старинні садиби Харківської губернії / В. К. Лукомський // З української художньої спадщини / Г. К. Лукомський. – Київ : Укр. пропілеї, 2004. – С. 18–154.
13. Марзеев А. Н. Жилища и санитарный быт сельского населения Украины / А. Н. Марзеев. – Харьков : Науч. мысль, 1927. – 196 с. : планы, карты, ил.
14. Маруневич М. В. Народное жилище гагаузов Днестровско-Прутского междуречья (XIX–нач. XX вв.) : автореф. дис. на соиск. учен. степени канд. ист. наук : спец. 07.00.07 «Этнография, этнология и антропология» / Мария Васильевна Маруневич ; Ин-т этнографии им. Н. Н. Миклухо-Маклая. – Кишинев, 1977. – 27 с.
15. Петрова З. А. Сельские жилые дома в Карпатах / З. А. Петрова. – Ужгород : Карпати, 1972. – С. 97–100.
16. Струнка М. Л. Українське народне житло Миколаївщини / М. Л. Сумська // Народна творчість та етнографія. – 1983. – № 2. – С. 63–67.
17. Сумцов М. Слобожане. Історико-етнографічна розвідка / М. Сумцов. – Харків : Союз, 1918. – 240 с.
18. Улашківський І. Саманні будівлі / І. Улашківський. – Київ : Рілля, 1912. – 16 с.
19. Харузина В. Н. Заметки о крестьянском жилище в Верхнеднепровском уезде Екатеринославской губернии / Харузина В. Н. // Этнографическое обозрение / ред. Янчук Н. А., Императорское общество любителей естествознания, археологии и этнографии (ИОЛЕАЭ) при Московском университете. – Москва, 1905. – № 2-3. – С. 7-13.

Рецензент: д-р іст. н. Г. Г. Кривчик

Надійшла до редколегії: 16.01.2016 р. Прийнята до друку: 18.01.2016 р.