

# **WATER-DRIVEN WORKSHOPS AND FACTORIES IN THE ZONE OF WATERFALLS OF EDESSA IN GREECE. AN OPEN-AIR WATER MUSEUM.**

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## **The history of the old industrial zone of Edessa**

Edessa is a city in the northern part of Greece, about 90 kilometers from Thessaloniki.

The abundance of water and the morphology of the site, created the ability for the exploitation and the utilization of the water as a source of energy for production purposes. The pre-industrial water-driven workshops (wheat and sesame mills, tanneries, fulling mills) were founded at the edge of the plateau, where the city of Edessa is built. The district of the “mills”, situated very close to the site of the famous waterfalls, is identified as the region where most of these workshops were located. It is sited next to the historical quarter “Varosi”, the first Christian neighborhood of the city, which was evolved from the Byzantine nucleus that was developed at the ancient acropolis of Edessa. The mills date back from the mid 19<sup>th</sup> century to the end of the 19<sup>th</sup> century. Earlier phases from the Byzantine period are detectable as well as later phases, which were caused by the modernization of the mills, some of which still preserve their mechanical equipment.

In the area near by the waterfalls of Edessa, the first textile factories were built. These factories were founded between 1874 and 1912 by Greek businessmen from Naussa, a city near Edessa, in the framework of a first attempt for industrial development in the region of Central Macedonia. The mechanical equipment of the factories originated in England, pioneer of the industrial revolution, where the textile industry was initially developed.

The first factory built was the Tsitsis & Co. spinery (1895), from which only traces of the original installation are preserved. Two more factories, which formed part of the business “Union of Industrial businesses Estia S.A”, were built, the first in 1907 and the second in 1926. The first, Known as “Kato Estia”, was a cotton spinning-mill and the second, “Ano Estia”, a textile factory. A hemp factory, which was built in 1908-1909, began its function in 1913 and produced mainly string and rope. A second hemp factory was founded much later (1930) in the entrance of the city. During the same period (1929-1930) a woolen-mill was founded named SEFE.KO (Sefertzis-Kokkinos and Co.Brothers) and became one of the most important factories in the Balkans.

The textile industry in Edessa reached its peak in the period between the two World Wars. In 1940 Edessa had 2.500 industrial workers in a total of 15.000 inhabitants. In 1954 these factories sold their water rights to P.P.C. (Public Power Corporation), a new hydroelectric power station was built, the factories were connected with it and they lost their no cost energy of water. The shareholders' number had already increased, while the functional problems of these factories began, which needed to be modernized in order to be able to compete with those of Thessaloniki, Athens and Piraeus. These problems led to their decline and their final closure after 1962.

**Aristoteles University of Thessaloniki research program and the first applications**

### **The research program**

The old industrial zone of Edessa at the area of the waterfalls, compose a unique historical and architectural complex, where the industrial history of the town is presented. We can see the development of the water-driven technology, from the first mechanical workshops to the water-driven factories at the beginning of the century, while the period of modernization is getting recognized in the period between the two World wars.

The Ministry of Culture safeguarded the preservation of the water-driven workshops and factories in Edessa, with their characterization as historical industrial monuments. Moreover the Municipality of Edessa was interested in their presentation and utilization. So in June 1991 it commissioned professor G. Velenis from the University in Thessaloniki, to work out a research project with the title "A study for the reuse of historical (industrial) buildings in the zone of waterfalls of Edessa". Programs' subject was: the area of the mills, the hemp factory and the textile factory "Ano Estia". The objective of the program for the presentation of the old industrial area of the town, is the creation of an open air-museum with multiply abilities where the industrial building, water and nature will dominate. In the research project of the University, which completed in 1994, participated the Ephorate of Modern Monuments of Central Macedonia, a department of the Hellenic Ministry of Culture (architect Ch. Zarkada). A team of 11 architects took also part in the project, as well as a topographer, a mechanical engineer and a photographer<sup>1</sup>.

### **The study for the application and the realization of the project**

The study for the application of the industrial buildings of Edessa is carried out by the Technical Department of the Municipality of Edessa in collaboration with the architect Ath. Pistiolis who took part in the research project of the Aristotle University of Thessaloniki as supervisor.

Building contractors materialize the project, after competition, which was organized by the Technical department of the Municipality, as supervising service (architect E. Ouroumi), while the works are supervised by the Ephorate of Modern Monuments of Central Macedonia (architect Ch. Zarkada).

### **More details about the restoration**

#### **The area of the "Mills"**

The district of the "mills" is identified as the region where most of the pre-industrial water-driven workshops of Edessa (wheat-mills, tanneries, fulling mills) were located.

The workshops were isolated or build in a group. The supply of water results from the branches of the two rivers and can be used for the function of 2-3 or more workshops at the same time, with the help of the water channels parallel in equal numbers following the centuries of the ground or according to the function of the workshops situated on a row. The structural characteristics are those found in the traditional houses of Varosi: tiled roof rectangular blocks, ground floor or two stores but later interventions used new materials (bricks and cement).

From the water-driven workshops in the district of the "Mills", known during the Turkish occupation as the place Tsiarkoriani Kapusu at the quarter Thzedit (New), a

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<sup>1</sup> Architects : Pistiolis Ath., Vlahou D., Vori E., Korreas M., Connena Claudio, Kalliga D., Sagiaks Zah., Valavanidou A., Bagiouk S., Pirpasopoulou Ch., Dimitrakopoulos E., the topographer Gatsios, Savidis K., the mechanical engineer Hatsitzogas A., the documentation of photograph by Katsagelos G., associate professor of Art School.

small number is preserved, while most of them were demolished but some parts of them can be found under the later landfills or their stone foundation under the surface.

**The water-driven workshops, which have been restored, are:**

**1. The first wheat mill [original owner Salabassis a.o.].**

The wheat mill was built prior to 1901. In the building, which has been preserved until today, there are two principal phases, where one part of the two-storied original nucleus is preserved while the other part, which is in the frontage, is being restored at the upper level increasing the height, because of the new mechanical equipment which in 1924 were purchased. The formation of a wooden penthouse next to the original mill was completed later increasing the space of the workshop. In the stone build ground floor there are three pairs of millstones with central activity, the original large wooden container, and the machine, which cleans the wheat, the “*trieri*” and the washing machine, the transporting screw of grinding lifts and the funnel with which the sacs are filled with flour. At the northern wall of the ground floor we can see openings of water pipes, which were blocked at a later phase and corresponded with the original nucleus of the water mill, where the propellers were horizontal, located under the level of the floor. On the first floor there were two rooms, one of them led directly to the ground floor. Here, the wooden hand-made sieves of the mill-from its restoration in 1924-, are preserved, which were made in a workshop in Thessaloniki. The second room of the store was the place where the miller stayed and did business, with his clients.

The water through a wooden channel fall on to a vertical propeller (roman type), which produce motion transmitted by a belt to an axis and from there by means of pulleys and belts to the millstones and the machinery on the floor above. This vertical wheel, with a diameter 5.5 approximately m. and width 1.2 m, constructed with metal and wood, was built during the modernization phase of the equipment in 1924. In 1963, when the mill stopped working, the wheel was sold to another water mill in the village Nisi, not far from Edessa. The Municipality of Edessa tried to buy out the wheel and to place it back at its original place, but without a successful outcome, so it was decided to reconstruct an identical wheel.

The mill's wheel of this period is vertical, instead of the original one, which was horizontal. The restoration of the building and part of the mechanical equipment are finished. In June of 1997, in this mill we organized an exhibition of the whole project, as the first activity of the **Open Air Museum of Edessa** and the occasion of the 10<sup>th</sup> International Conference of TICCIH.

**2. The second wheat and sesame mill [original owner Pertsemlis a.o].**

It is a stonewall, tile-roofed single floor building. It is the best-preserved water-driven workshop, which preserves the whole equipment of the sesame mill. Two water channels with inclined metal pipes end up in the working place. The two systems of water movement have both horizontal propellers. At first it must have been a wheat mill, but later it was turned into a sesame mill. Perhaps the area of the oven is decisive for the functional years of the sesame mill.

The process of the production of the oil from sesame: at first it is washed and then it is baked in the oven. Then it is grinded at the millstones and turns into a paste. The paste boils in a special boiler with a staring wheel and gives “*tachini*”, which next is compressed at the presses and gives finally oil, while the remains are gathered right next to it. A part of the workshop is closed. That's the place where the manager works and in this room there's fireplace.

**3. The third wheat and sesame mill [original owner Giannakis].**

From the original workshop is preserved the stonewall shell without the roof and also a part of mechanical equipment. An interesting part is the reservoir supplying water, the water tower and the inclined pipe, which brings the water and moves the horizontal wheel (Greek or eastern type), which is preserved under the floor of the workshop. This system is from the Byzantine phase of the water mill, proving the existence of the water - driven workshops at this place from the Byzantine times. Here we have another case of a wheal mill and a sesame mill in the same building.

For these 3 mills, the proposal concerns their preservation as museum and the creation of an exhibition area in the rest of the buildings.

#### **4. A tannery [original owner Karanikolas]**

From the original two-storied building only the stonewall shell ground floor is preserved, while nothing of the original equipment is survived. This tannery is going to be used by the city as a tourist information center. The creation of a botanical garden for educational purposes is proposed for the space in front of the building.

**5. An other wheat and sesame mill [original owner Paskou Brothers]** existed prior 1910. From the original workshop is preserved part of the exterior stonewall shell and the trace of three supplying waters. The proposal concerns the conservation of the surviving part and the addition of a new construction for the creation of a market with small shops in the interior of the building that will extend outside it.

**6. A wheat mill [original owner Liandis]**, with “four millstones” was built prior 1908. It’s a single stone building constructed with local stone. In this mill are preserved the original millstones and the modernization of the water driven workshop was done in 1963. In recent times, was building the miller’s house, without a permit, next to the mill.

Our renovation proposal is to restore the mill and to construct a new multipurpose underground hall for 500 people, with its lobby connected directly to the mill.

#### **7. The “batani”fulling mill [original owner Tona brothers]**

On the ground floor of the building was the workshop, while on the floor above the miller’s residence. From the original mechanical equipment it’s only preserved the metallic pipe supplying water for the movement of the machine.

From the original water-driven workshop with the use of fulling mill(“batani”), was conserved only part of the stone-wall nucleus. The image of the building is known of archive pictures.

#### **8. The sesame mill [original owner Arditsoglou brothers]**

Next to the “batani”, is another sesame mill, in bad conditions of conservation, but its mechanical equipment is preserved.

The two last workshops are restorated and here will be housed the directory of the Open-Air Water Museum of Edessa.

At the site of an adjacent ruined mill there will be in full scale a model of the mechanical equipment of a traditional fulling mill.

At the site of an old mill that has been demolished, a new cafeteria - bar will be created describing the original building, while an open - air cinema is being designed at a lower level. The semi-open air space of the cafeteria is extended to the adjacent part of the mill, whose foundation has not survived, but whose location and outline is known from an air photo of the town of 1933. A construction of a modern wall signifies the outline of the original mill, while the use of water (canals-a small artificial lake) as well as the reconstruction of the water - wheel in its original site, completes the layout of the space.

## **The hemp factory "Cannavourgio"**

### **The history of the factory**

The hemp factory was founded in 1908-1909 by the: company Totska and Co, N. Mantalaki, brothers Zikopoulou, Ismail Tsipa, Ef. Chatzitripkou, Filota Chatziaggelou, Erig Chatziantoniou, Silvestro Batsiloglou and other small shareholders. In 1912, due to inexperience of the shareholders for industrial business, the whole management of the factory is given to the businessman H. Chatzidimoula and his company. The factory begins its function in 1913 with two hundred horsepower, while 100 workers are employed and 1.200 kilos of strings and ropes are produced every day. It was the only factory of its kind except a small one in Corfu.

The raw material for manufacturing was Indian hemp, imported from Benares region in India, while cord was manufactured initially from Serbian hemp and then from local hemp grown in Giannitsa and Koufalia. Rope was produced in a range of thicknesses, the differing sizes numbered 1-2, 2-2, 2-3, 2-4, 2-5, 2-6 and 2-7. The main commercial office of the company were located in Thessaloniki, at 7 Leontos Sophou St. It was from here that the product was marketed and distributed. The thicker rope was sold to Crete, the main market for rope, and to Epirus and Thessaly, while the thinner cords were sold to the tobacco industry in Eastern Macedonia and Thrace.

The mill reached its peak in the years 1928-1940, when 150 workers were employed. The decline begun in 1950, largely due to the managerial ambitions of the shareholders. In 1966, the company's 100 workers form the "Pella Worker's Cooperative" and took over the management of the mill. In 1967 it finally closed down and the ownership passed to the Municipality of Edessa. At that time there were only four such factories in Greece (Corfu, Volos and Piraeus). In 1983 it joined the Ministry of the Arts catalogue of listed buildings (Ephoria of Modern Monuments of Central Macedonia).

### **The building's installations and the place**

The open space of the hemp factory is a vast area, which begins from the district of the water mills, continues amphitheatrically and ends at the main buildings of the industrial complex, which is located on a clear plateau, which is higher than the plain of Edessa. A lot of trees form a natural park with a wonderful view of the plain below. A stone road that is preserved in a very good condition connects the historical quarter of Varosi with the hemp factory. Next to the district of the water mills there is an entrance, which was used by the factory workers. Going down the stone road you meet a second gate and much lower a third entrance - the main gate of the factory with a guardhouse.

The factory building was constructed according to a design common at that period. The different buildings of the complex are designed to a rectangular plan, with uncluttered, even facades pierced by rows of large window apertures. The gable roofs created the familiar triangular pediments at each side of the buildings. The main shell of each building was constructed of tuff stone from the hemp factory's own small quarry.

At the upper entrance of the site the pumping station regulated the flow of the water in two directions a) to the central conduit, where the water would turn the great turbine of the production building, and b) to the smaller conduit which turned the machine workshop turbine.

Lower down, the machine workshop was located, adjacent to the boiler room. The machine workshop served the needs of the factory for maintenance and repair, as well as manufacturing the various sizes of bobbins for the production machines. Next to this

building was the boiler room, which generated the stream that traveled through underground pipes to the workshop to power the slashing machines.

The lower entrance to the factory, mainly used by vehicles, was the site of the guardhouse and vehicle control point. Further down from here stood the two-storey building where the product was packaged for shipping.

The production building still retains all its old mechanical equipment, along with the water-powered turbine. The building stands on the central level ground within the complex while on a lower there is the site for the assembly of the workers.

A short distance from the production-building stand the dressing room and the sanitary facilities, laid out in a row.

### **Production process and mechanical equipment**

The processing of the hemp was carried out as follows: first it was sprayed with a special oil which had a softening effect on the material, next impurities were removed using a special machine called a “valivitsa”. Then followed the pre-carding and carding stages, in which the hemp was drawn out into strips of the required thickness. Then with the draw frames the fibres of hemp came into parallel lines before their first twisting on the twisting hemp (known as sitzim) machines which braided together four of the initial sitzimia into one thicker strand. This was then transferred to the scrapers, which removed the fluff from the rope. The rope was then subjected to sizing with rice flour and dextrin, drying and reeling. The fine twisting machines administered the final twisting.

The equipment in the production building and the machine workshop are all water-powered, the original hydraulic turbine was replaced in 1939 with a new VEVEY turbine. Most of the machinery was imported from England or Germany.

The factory preserves its mechanical equipment until the present. The machines of the production line, as well as the working-shops are water-driven with a system, which is the same as the one on the factory Kato Estia where the traditional water wheel was replaced in 1939 with a turbine - Verey type.

The Valivitsa, a kind of falling mill, is of Seydel & Co Bielefeld type, the fine machines are one of them type fairbairn Mac Pherson Leeds Or 714 Branch of fairbairn Lanson Combe, Barbour Ltd of 1913 and the other one is Seydel & Co Bielefeld and the reels are also type fairbairn one of them of 1913 and the other of the year 1927.

### **The proposal of the restoration**

According to the renovation proposal the whole factory complex will be converted to an industrial museum, supplemented by leisure and recreation facilities to be organized in the factory's smaller buildings. Thus the main production building would operate as a museum in which all the original equipment would be preserved. A number of machines would be repaired and restored to operation, along with the hydraulic turbine, for purely educational purposes. Within the same area a permanent exhibition will be installed to illustrate the industrial history of the hemp factory. Outside in the factory grounds an “exploratorium” is installed two different zones with specially designed small-scale machines, devices and instruments used by visiting children, enabling them to acquire a better understanding of the use of water as a source of energy. These zones will be organized in a) the immediate vicinity of the water regulation, and b) on the level ground, which is sited a little above the main mass of the factory complex.

Inside the production building is proposed the reconstruction of the partition wall dividing the first hemp-processing section of the factory from the remaining space. Here the machinery will remain in place, as exhibit, but the space will also serve as a

restaurant area. The restaurant facilities will also extend out to limited area in front of the building, enjoying a view out over the surrounding plain.

The two-store building where formerly the rope was packaged for shipping is to be converted into recreational facilities. The other buildings in the factory complex would be restored and used for their original purposes, apart from the machine workshop, which would be converted to museum space and a refreshments area, with the option of extending this latter use out into the immediately surrounding area. The lower area of level ground, south of the mill, would likewise be laid out for recreational purposes.

Movement around the open-air space of the factory grounds, with their considerable differences in level of terrain, would be facilitated by the construction of two elevators. For the rest, no changes are planned to the site beyond repair work and a certain amount of replacement and extension of the stone paving.

In the site of the hemp factory is operating a restaurant and a space for recreation and cultural activities.

### **The textile factory “Ano Estia”**

#### **The history of the factory**

On the valley of Edessa (Loggo), in a small distance from the waterfalls' park, a textile factory was founded in 1907 by Ir. Chatzidimoula, I. Chatzinikou, the brothers Lappa and Ant. Basdari. Much later, in 1926, the same owners founded a textile factory next to the waterfalls' park. These two factories were in fact one company name-as mentioned- the Union Industrial business Estia S.A. The cotton-spinning mill in the valley was known as the “Kato Estia” and the factory in the district of the waterfalls as the “Ano Estia”. Three hundred workers were employed between 1962 and 1964, the company's owner is An. Papanikola, while in 1964 the factories passed over to the Greek State, due to their debts. In August 1965 the workers and employees Co-operative of the Estia factory took over their management. In 1972 the company was acquired by the industrialist Triantopoulos and was renamed “Textile Factories of Edessa S.A.”. However, in 1981 the company finally closed down and passed over to the Hellenic Bank for Industrial Development. Today it belongs to the Municipality of Edessa.

#### **The buildings and the site.**

The facilities extend in two different levels, due to the slope of the ground and are organized around the main building of the cotton-spinning mill, which is a two-storied long rectangular construction. Next to it was the boiler-room and in a small distance at a lower level the starching room. A smaller building, the ironsmith workshop, supports the installations. Next to the main entrance were the administration offices, the warehouse and the guardhouse next to the second gate, which was on a lower level.

In 1989 a fire destroyed the main building. From the main building only the three stonewalls of the shell are survived but not to their full height. The interior structural system and floors made from wood were totally destroyed by the fire as well as its wooden roof.

#### **The mechanical equipment**

The factory was driven by electricity, which was produced by the “Kato Estia” factory. The boiler room had a boiler Roston-Horsby 1926 model. From the boiler-room two pipes gave heat and steam to the cotton-mill but the boiler was mainly used for the steam initially underground, to the starching-room. The factory produced dimity (jean), white flannel and calico. The mechanical equipment of the spinning mill was organized with seven workbenches (spinners), while the wearing mill had 114

looming machines English type Dickinson, Hatersley and Hakey. All these looming machines were sold to VIOHALCO for scrap metal and were replaced by modern ones (Picanol, Dormier).

### **Proposal of the restoration**

The research program of the University concerns with the restoration of the building and its conversion to a hotel with 85 beds and a multipurpose hall in the ground floor. The new utility room and maintenance facilities will be housed in the former boiler room and hotel's accounting office will be in the old guard house. The ironsmith's workshop will be converted to a small exhibit space.

There will also be an information center at the entrance of the open-air museum of Edessa at the slope of the ground. In this area there are two showing rooms, one is permanent and the other will have the possibilities of a multipurpose hall and also a convention center. There will be an underground parking place for 70 cars between the factory and the apartment blocks in the neighborhood adjacent.

The main element, which organizes the interior as well as the exterior, is a diagonal axis which has not only a functional character but also it refers to the intensions for the extension of the factory with two more modular, as we can see in a advertisement of all the factories of Co. ESTIA in 1939, where the factories or Thessaloniki are included.

This intent is expressed with an abstract manner, projecting on the diagonal axis, deconstructed element, with a functional character. On this axis we find all the vertical and horizontal circulation that serves the new hotel.

### **The program of the restoration and function of the open-air water museum**

The restorations and the realization of this whole project in the area of the "Mills" will soon be completed, while the restorations of the factories "Ano Estia" and Hemp Factory are in progress.

The Municipality of Edessa in collaboration with the Ephorate of Modern Monuments of Central Macedonia (Hellenic Ministry of Culture), have started a research for a model conveyor who will administer this unique open-air Water Museum, while as mentioned, two water-driven workshops (fulling mill -sesame mill) in the district of the "Mills", the offices and the library of the museum will be housed there.