PRESERVATION OF OLD SHIPS – RECONSTRUCTION OF SMS MONITOR
LEITHA OF 1872

Očuvanje starih brodova – rekonstrukcija monitora SMS Leitha iz 1872.

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Summary

A short overview is given on the preserved sailing and steam ships in various shipping museums of the world, mostly from Great Britain and the USA. An example is the iron bark Satar of India, ex Euterpe, on display in San Diego, California. The lecture focuses not only on their present state, but also on their surroundings, publicity and the appeal these restored ships may have from a visitor’s point of view. The lecture will also provide some thoughts about possibilities of sailing ship preservation in Croatia. The second part of the lecture deals with three historical vessels under the auspices of the Zoltán Foundation, preserved at Neszmély Hungary, and now undergoing restoration in Hungary and Slovakia (Komarno) within the framework of an EU project. These are the tugs Zoltan (built in 1869), and Bakony (built 1957), as well as the first Austro-Hungarian Monitor Lajta, ex SMS Leitha, built 1872. Details include problems in choosing the correct state (date) at which the reconstruction should aim, work performed by professional engineers and dockyard workers, but also enthusiastic model builders.

Although several basic monographs and articles have been written about her, in the particular case of the SMS Leitha/Lajta, a fighting ship with very restricted and crammed spaces, there is a multitude of practical questions on reconstruction details (original engine, weapons etc) and public presentation (how reconstructed parts should be imitated, how visitors will be able to access the ship etc.), to be solved, which will be discussed.

Key words: preservation, restoration, steam ships, monitor
INTRODUCTION

This lecture discusses the general problems of historic ship preservation and representation; in particular, however, the long awaited reconstruction of the Monitor LEITHA/LAJTA.

The Danube Monitor LEITHA is not unfamiliar to the audience of the International Conferences on Industrial Heritage in Rijeka (also called “Torpedo Conferences”, as the first of the conference series concentrated on the 150th anniversary of the Torpedo Works in Rijeka).

Dr. András Margitay-Becht already has held a lecture on the history and state and possible reconstruction of this exceptional vessel at the 1st (“Torpedo”) conference.¹

LEITHA/LAJTA was also among the vessels discussed in the lecture on the Neszmély Shipping Museum and the ZOLTÁN Foundation at the 2nd International Conference on Industrial Heritage by Capt. József Horváth and Dr. György Ákos, which showed the state of the ex monitor in 2007, after some absolutely necessary bottom repairs and repainting, and also discussed the restoration possibilities.²

SIGNIFICANCE OF LEITHA

Though the lecture by Dr. András Margitay-Becht discussed this question, we deem it necessary to restate here the most significant technical and historical facts of the LEITHA from an other aspect.

The following question may be raised: Why is this ship body so important, that it was worth to fight for two decades for its reconstruction?

The features of LEITHA (and her sister ship, the MAROS) at the time of built:
1. / They were the first river monitors of Europe.
2. / The first river monitors of the world which contained gun turrets of system Coles.

In the navy of the Austro-Hungarian Monarchy, these ships had several “firsts”:
3. / first warships driven purely by steam, without sails,
4. / first armored ships built purely of metal,
5. / first vessels with a rotating turret, a so called turret ship,
6. / first units driven by twin screws,
7. / first warships with plates and protective armor made by the Bessemer steel production system,
8. / first vessels using a water closet.

The features of the LEITHA during her career:

1. It happened on the deck of the LEITHA fighting on the Sava River, on the 12th of August 1914, that the first Hungarian war loss occurred: seaman János HÚJ, died a hero’s death here.

2. In 1918 LEITHA and MAROS were the oldest units of the Austro-Hungarian Navy still effectively fighting.

The present features of the LAJTA Monitor Museum Ship:

1./ Besides her already demolished sister ship, she is the only monitor in the world, which represented during her long career all the variants of the constantly developing, modernizing monitor ship type. When she became hopelessly obsolete, she was not broken down, as usual in the case of the war ships of rich countries, but she was rebuilt into a form that was considered as modern at that time. She served on in five main forms, and their variants.

2./ There were almost 200 ships which represented this monitor ship type, which had been in service for almost hundred years, (1862-1965). To our best of our knowledge, only 7 of these remained in the world (besides the Brazilian monitor Parnaiba (U-17) built in 1938, and still active):

- the Chilean HUASCAR (built in 1865, déplacement: 1130t), a one turret high sea monitor, a swimming museum ship which today can move by her own engines,
- the Australian CERBERUS (1868, 3344t), double turret high sea monitor is presently tossed about on a cliff, near the shore. Sponsors are being looked for today to raise and reconstruct her,
- the Swedish SÖLVE (1872, 460t), a one turret coastal monitor, merely a ship body swimming in water, also a museum object,
- the Serbian BODROG/SAVA (1905, 440t), a two turret Danube monitor is still working as a floating body,
- the British M-33 (built: 1915-ben, d.: 535t), a double turret high sea monitor, standing in dry dock, as a museum ship which could be preserved as a complete unit,
- the Ukrainian ZHELESNAKOV (1936, 230t), river monitor – a monument to herself (!) in Kiev.

And the seventh is our LEITHA/LAJTA. A distinguished placing!

It should also be noted, that of the seven monitors that remained until today, the LEITHA “version” is the only one, where the command turret is placed upon the gut turret. This early feature, which had been devised in America, has
only been used in Europe on a few monitors, as it turned out to be a failure. Here, on the Danube, only the first two forms of the MAROS-LEITHA pair has been such. After 1893 nobody chose this technical solution.

3./ The LAJTA Monitor Museum Ship, besides her present Hungarian owners, may also touch emotionally many members of foreign nations. First of all, the citizens of the present day successors of the Monarchy, the nations which have fought with us in the First World War, and also previous owners of monitors, in particular the citizens of the US and Sweden. The former, because this type of vessel has been born there, the letter because her inventor was Swedish.

**RECONSTRUCTION OF THE LEIHA**

In the lecture of Dr. Margitay the already mentioned, question was already raised: **in which state the monitor should reconstructed in?**

It was finally decided that she should be reconstructed in her second form (first reconstruction of the original vessel) of 1887 – see the two Figures below: a contemporary drawing by Kálmán Szabadi and a computer reconstruction by Dr. Tamás Balogh (this latter shows the placement of the toilets both before and after the reconstruction for comparison purposes):
You might well ask why?

As by today only the body of the once proud SMS LEITHA is available (which did not change during her whole career), it would have been technically possible to reconstruct any previous state of the monitor. The simplest solution would have been her oldest form, existing between 1872 and 1887, as this form is most like the namesake of the type, the USS MONITOR, launched in 1862. This, however, would not have been very spectacular!

The second version, lasting from 1887 to 1893 can offer much more to the visitors. It has an upper gun deck, with two different ways of getting to it, and from where the whole structure of the ship may be viewed. There are two Palmkranz-Nordenfelt machine guns here, and the smoke stack can be tilted down.

As this form can show anything that could be present in the first version (ice box, pig stall (!), the turning of the gun tower, the loading of the guns, the test of the hammocks etc.), therefore with this decision of ours, the visitor looses nothing, he may also enjoy undisturbed the mood of the ship at the time of her launch. The not to be depreciated fact, that this version is the only one, in which the vessel did not hurt anybody, who’s great grand child might look at her as an enemy, is also a possible argument.

Thus the decision was made: the second version should be built!

**TECHNICAL DATA OF S.M.S. LEITHA, LAJTA MONITOR IN 1919, RESPECTIVELY**

**I. state:** Time of building: laying of the keel: 1870, launch: 17th May 1871, first test run: 25th March 1872

**Data:**

Plans were prepared by: Josef von Romako ship building supervisor and Anton Waldvogel chief machine engineer, in Pola.

Manufacturers: the ship body was built in the “First Hungarian Pest-Fiume Shipyard Share Company (“Első Magyar Pest-Fiumei Hajógyár Rt”) then at the Shipyard of Óbuda” (“Óbudai Hajógyár”).

- the armor was made at the “Neuberg-Mariazeller Gewerkschaft” in Neuberg am der Mürz (Austria)
- the turret was made in the “Cyclops Steel & Iron Works” factory of the “Charles Cammel & Co. Limited” Company, in Sheffield (England)
- the framing was made at the steel work named “Butterley Engineering”, existing even today, in Derbyshire. (England)
• the boilers and steam engines at the “Locomotiven- und Maschienenfabrik von Georg Siegel, Wien und Berlin”

• the donkey steam engine turning the turret (from 1874 on) at the “Machine and Steam Mill of István Röck” (Röck István Gép- és Gőzmalom Gyára”), in Budapest

Dimensions: déplacement: 310 t., length: 49.98 m, breadth: 8.12 m., draught: 1.07 m.

Engine: 2 locomotive boilers
2 standing, high pressure, fast moving, double cylinder hammer steam engine, 320 HP = 235 kW

Speed in standing water: 8.3 knots = 15.3 km/h

Range: 600 nautical miles, i.e. 1,111 km

Armor: Bessemer steel, 16 mm on deck, 44 mm at the sides, 50 mm on the side of the gun turret, and 25.4 mm at turret roof.

Gun turret: system Coles (i.e. running on rollers at the bottom), made of 200 mm teak wood.

Armament: 2 pieces of 1861 M type guns, system Wahrendorf (breech loading, rifled, cast iron), with cylindrical breech lock

Caliber: 149.1 mm, barrel length: 3086 mm, mass: 2858 kg, fire repetition rate: 4 every minutes.

Range 5800 m with “1861 M” type grenade, and 4000 m with “1878 M” type shrapnel.

Rebuilds:

I./A. shape: in 1879: the shape of the command tower was made peaked, and the look-out slits were made horizontal.

I./B. shape: in 1882: she received one piece of 25.4 mm light machine gun type Palmkranz-Nordenfelt (shrapnel gun), which could be set up at two different point on the deck. (25.4 mm = one inch)

I./C. shape in 1884: she received a smoke stack which could be tilted at the Óbuda factory of the DDSG (Donau Dampfschiffahrtsgesellschaft)

II. shape in 1887: she received a “T” shaped upper gun deck, which had covered the reshaped water closets on the two sides of the deck in the line of the smoke stack, perpendicular to the length axis of the ship on one side, and which also reached the gun turret by reaching forward, along the length axis of the ship. Above the water closets there was a light machine gun type Palmkranz-Nordenfelt on each side.
We shall not go into the details of the other shapes, these can be found in the appropriate literature [4, 5]

**Fate after WWI:**

**1921:** her weapons, armor, machines were dismounted at Korneuburg (Austria), her military career ended, only the ship body, incapable of moving herself, remained, which was bought by the Fleischmann Company of Budapest.

The history of the vessel up to now:

Between 1928 and 1994 she worked as a working machine (gravel elevator), up to 1946 under the name of “JÓZSEF LAJOS”, and up to 1994 as “FK-201”. The ship body is a national monument from 11th Nov. 1992, being the property of the Museum for Military History since 6th Oct. 1993. The working machines have been demolished in Feb.-March 1994, awaiting renewal in the township of Neszmély since 25th April 2005, which is organized by the “ZOLTÁN Steam Ship Public Utility Foundation” (“ZOLTÁN Gőzös Kh. Alapítvány”). The planning of the reconstruction was begun in September 2009.09 and on 26th Nov. 2009 she was towed to the ship yard in Komarno, Slovakia. There she was put on the stocks (rather rails) in March 2010.

**PLANS FOR THE RECONSTRUCTION**

The plans were made by András Stankovics of the Navalis Bt. in Hungary.6

Several books and articles [7] were used in the planning, as well as a model of the LEITHA in the state of the second state, made by Mr. Fiedrich Prasky.

Responsible for historical correctness is Dr. András Margitay-Becht, entrusted by the owner of the LAJTA, the Military Institute and Museum (HIM) with the right of veto. Implementation is carried out by the Company “SK-REMONT”, with the leadership of Mr. Ferenc Kiss and Eng. György Soós. Taking into account the importance of the project they only charge a minimum of profit.
The Figure below shows a plan for the reconstructed gun tower command tower, and a computer simulation of the four-barrel Palmkranz-Nordenfelt machine gun:

![Figure 2](image1.png)

![Figure 3](image2.png)

Note that while the gun turret is turning, the command tower does not!
RECONSTRUCTION WORKS AT THE YARD

The photographs below, taken very recently, show how the combined gun tower and command tower, the most characteristic feature of the monitor, is being built into the body of the LEITHA.

THE CONSTRUCTION OF SMALLER WEAPONS AND OTHER PARTS

Many individuals and companies, societies and clubs volunteered to help reconstructing the LEITHA monitor.

Among them are the members and ship model builders of the TIT Society for Shipping History, Modeling and Tradition (TIT HMHE), who reconstruct smaller and larger weapons, contemporary artifacts of the ship etc. This enthusiastic group is led by the Secretary of the Society, János Bicskei, who does the burnt of the work, which includes research, planning, and construction.
Stand and after part of the Palmkranz-Nordenfelt Mitrailleuse in the state of building

The reconstruction is not made in the original construction (weight saving is an important aspect), most parts will be made moving as in the original.

THE PRESENTATION OF MUSEUM SHIPS ALL OVER THE WORLD

The authors have visited many places in the world, where old ships have been restored and put on display for the public. This not only includes such surviving ships that have some relation to the LEITHA, like the Dutch vessel BUFFEL, but also old time sailing ships and relatively new warships. It should be emphasized that this more a visitors’ view rather than a conservationist view. In this case we are more interested in how much the visitor’s interest (and perhaps that of tourist organizations) can be caught, how is “the message coming through”.

Without going into the details, we would like to show some examples of good and bed practice of gathering visitors.

![Figure 8](image-url)

The above photograph shows South Street Seaport in New York. Though several beautifully reconstructed ships, the one monstrous four mast bark PEKING and the three mast VAWETREE, as well as tugs, etc. may be seen, it was almost deserted at the time of our visit in 2005, while the Intrepid Air and Sea Museum with its aircraft carrier, open air aircraft museum and USSS GROWLER submarine in upper New York was crowded with visitors from all over the world (many from East-Asia). One might argue that probably the fighting techniques of the 1950’s are more popular than the era of sailing ships, but this not the case. It is probably more correct that the many-sidedness of the carrier can be better exploded for the tourist companies (which are capable to
move large crowds of visitors), than the site of the big sailing ships, or simply that the leadership of the letter has not taken full advantage of the tourist possibilities. Accessibility is certainly not the point: visitors, who would like to get an inside view of the cluttered “deck” of one of the submarines that carried rocket weapons, wait patiently for at half an hour and more in the waiting room.

But there are also other good examples. At Mystic Seaport in Mystic Connecticut, where the old whale ship Charles W. Morgan has been photographed, is such one. The sailing ships have been reconstructed and shown to the public more or less like in New York. But there are not only the ships, but much more see and live through. The place is full of live events – such as hammering out a nail before visitors eyes (and are presented with it – pretty women have of course advantage). But this is exactly how non direct ship enthusiast can be drawn in into the “game”. Just think of it! The reader of this specialized article is probably a “ship fan”, but are our wives or husbands all like this? They need more, with right – some kind of a show in the best sense of the word for large and small.

Why are we telling all this now?

Because we want to stress that in the case of the reconstructed LEITHA, as in the case of other historic ships, it is not enough to exhibit it somewhere and “wait for the visitors”. As we have seen, one of the reasons for choosing the second state of reconstruction is that it should be spectacular. This is a good start, but other means, such as tourist organizations, societies, clubs etc. should
be drawn in. Additional attraction, perhaps on the shore beside the ship should also be considered.

As a possible example we would like to draw the reader’s attention to the fact, that Military History Museum ("Hadtörténeti Múzeum") has many types of guns in its open air display, among them there are several original early breech-loading, rifled guns of the Wahrendorf type, used by the Austro-Hungarian Navy from about 1870.

Now, as given under the data of the LEITHA, she and her sister ship the MAROS were equipped in their original form with this type of gun. In fact, there were two calibers of this gun in use: 15 and 12 cm, and both can be seen at the Museum. The monitors used the smaller caliber. One of the guns, see the photograph below, was manufactured 1870, just one year before LEITHA has been launched – it might have been manufactured for one of the monitors!

![Figure 10](image)

A 12 cm Wahrendorf gun manufactured in 1870, in Vienna, at the courtyard of the Military Museum in Budapest. The rifling can be clearly seen.

Just think of the interesting possibility of rebuilding a mock up of the original gun turret version nearby, which could be looked at from all sides and eventually visited. Ideas like this, and their realization are required to keep up the interest in such a museum ship like the LEITHA.

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1 See the already mentioned books of Mr. Prasky and dr. Margitay-Becht
Summary:

After introducing the first river monitor on the continent, still in existence, the SMS LEITHA/LAJTA, and having described shortly her history as a fighting ship and as a work ship, we have given details of her reconstruction presently under way.

Some of the plans, computer simulations, as well as the actual reconstruction works at the yard and the building of weapons and other small items have been shown.

We also made an excursion into the problems of ship preservation – this time from the visitor’s point of view, and discussed some of good and not so good examples of presenting old ships to the public, and made some conclusions regards the possible presentation of the LEITHA – soon also to be an other museum vessel worth to be visited in Hungary.

LITERATURE (ENDNOTES)


3 M Parnaíba (U-17) http://pt.wikipedia.org/wiki/M_Parna%C3%ADba_%28U-17%29


5 Id. Margitay-Becht András: A LEITHA MONITOR ...és a többiek, (”The Monitor LEITHA and the others…”) Hadtörténeti Intézet és Múzeum, Budapest 2007

6 See the lecture of Mr. András Stankovics, at the Conference on the second ‘Day of Hungarian Shipping’ in Neszmély, 2nd October 2005. A lecture on the history of the LAJTA was held by Dr. András Margitay-Becht at the same event.

7 On history, construction, plans and sources, see the lecture of Mr. F. Prasky: “Der Donau-Monitor S. M. “LEITHA”, held on 7. 11. 1998 at Erdőbénye, Hungary

8 Gy. Ákos: Az Intrepid Air and Sea Museum, Haditechnika2006/5, pp. 33-35

Sažetak

Dan je kratak pregled očuvanih jedrenjaka i parobroda iz raznih pomorskih muzeja svijeta, većinom iz Velike Britanije i SAD-a. Jedan je primjer čelični jedrenjak Satar of India, nekadašnji Euterpe, koji je izložen u San Diegu, Kalifornija. U referatu nije samo predstavljeno njihovo sadašnje stanje, već se govori i o njihovu okruženju,
publicitetu i o tome koliko su ti obnovljeni brodovi privlačni s gledišta posjetitelja. U predavanju će biti riječi i o mogućnostima očuvanja jedrenjaka u Hrvatskoj.

Drugi dio referata bavi se trima povijesnim brodovima pod pokroviteljstvom Zaklade Zoltán, koji se čuvaju u mjestu Neszmély, u Mađarskoj, a sada prolaze postupak obnove u Mađarskoj i Slovačkoj (Komarno) u sklopu jednog od projekata Europske unije. Riječ je o remorkerima Zoltán (izgrađen 1869.) i Bakony (izgrađen 1957.) te prvome austrougarskom monitoru Lajta, nekadašnjem SMS Leitha, izgrađenom 1872. godine. Referat uključuje podrobnosti o teškoćama pri odabiru ispravnog stanja (datuma) kojemu bi rekonstrukcija trebala težiti, kao i radovima koje izvode stručnjaci, inženjeri i brodograđevni radnici, ali i modelari entuzijasti.

Iako je o njoj napisano nekoliko monografija i članaka, u slučaju SMS Leitha/Lajta, bojnog broda s ograničenim, prenatrpanim prostorima, postoji cijeli niz praktičnih pitanja o rekonstrukciji (originalni motor, oružje itd.) te predstavljanju javnosti (kako bi trebalo imitirati te dijelove, na koji će način posjetiteljima biti omogućeno da pristupe brodu itd.) koje treba riješiti i o kojima će u izlaganju biti riječi.

**Ključne riječi:** očuvanje, obnova, parobrodi, monitor