

7. Other Publications

1. Somogyi Honismeret 2005/2. A somogyszili általános iskolák története 12-24. p. Kiadja a Megyei és Városi Könyvtár és a Somogy Megyei Honismereti Egyesület Somogy Megye Közgyűlésének támogatásával; Készült a Két „M” Bt. Nyomdában
2. Dr. Marek János – Fülöp Márta – Lesz Éva: Múlt, jelen és jövő a József-hegy alatt – Somogyszil monográfiája; Kiadja: Önkormányzati Hivatal Somogyszil, Sámoly Endre polgármester; Nyomtatta és kötötte: Két „M” Nyomda, Kaposvár, 2005., 241-291. p.
3. Somogyi Honismeret 2007/2. Kaposvár villamosításának rövid története (1893-1990) Kiadja a Somogy Megyei Honismereti Egyesület Somogy Megye Közgyűlésének támogatásával; Készült a Két „M” Bt. Nyomdában, 28-34. p.
4. Somogyi Honismeret 2009/2. Somogyszil élete egykor és most Kiadja a Somogy Megyei Honismereti Egyesület Somogy Megye Közgyűlésének támogatásával; Készült a Company Studio Nyomdában, 9-14. p.
5. Somogyi Honismeret 2011/2. 90 éve született Várhalmi Károly Kiadja a Somogy Megyei Honismereti Egyesület Somogy Megye Közgyűlésének támogatásával; Készült a Corvina Nyomdában, 52-56. p.

THESES OF PhD DISSERTATION

ÉVA LESZ

**THE HISTORY OF THE HYDROELECTRIC POWER STATION
OF IKERVÁR 1895-1995.
(Its function in the electrification of the West-Transdanubien)**

**BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
FACULTY OF ECONOMIC AND SOCIAL SCIENCES**

**PhD SCHOOL IN PHILOSOPHY AND HISTORY OF SCIENCE
PROGRAMME OF THE HISTORY OF TECHNICS AND
ENGINEERING**

SUPERVISOR: Dr. JÓZSEF NÉMETH CSc.

BUDAPEST, 2015.

similar hydroelectric power plant investment in Nagyszeben at the same time (1896) in Transsylvania offers a good comparison. While the project was initiated and financed by the (mainly Saxon) citizens of the town Nagyszeben, the largest estates had capital in the Transdanubian region and the initiators were the aristocracy, which supplemented their weaker capital strength with foreign capital. It explains why the alternating current Hungarian electric equipment (Ganz) was built in Nagyszeben and the Swiss direct current one (Thury) in Ikervár.

5. Nowadays, at the beginning of the 21st century, direct current high-voltage power transformation with semiconductor current control has come back to electrical engineering. We can conclude that the direct current high-voltage power transformation built in Ikervár 120 years ago, the predecessor of the most modern system of today on a world scale as well, is an outstanding memorial of the history of engineering.

6. Publications on the Topic of the Dissertation

1. Vasi Szemle LXII. évfolyam 1. szám 2008. Az ikervári vízi erőmű egy évszázada (1895-1995) 87-100. p. Főszerkesztő: Gyurácz Ferenc; Kiadja: Vas Megye Közgyűlése, Szombathely
2. Pollack Periodica Vol. 3, No. 2, pp. 111-117 (2008) History of construction of the hydroelectric power plant at Ikervár
3. Pollack Periodica Vol. 3, No. 3, pp. 133-140 (2008) The operation of the hydroelectric power station of Ikervár in the first half of the twentieth century
4. Pollack Periodica Vol. 4, No.3, pp.167-171 (2009) The History of the hydroelectric power station of Ikervár in the second half of the 20th century
5. Training and Practice (2016) The debate as a teaching aid in the mirror of the establishment of the hydroelectric power station of Ikervár – to be published

5. Theses (English)

I summarize the theses of the dissertation as follows:

1. The history of the power plant is a good example of the development of electrical engineering at the end of the 19th century. At the beginning they applied a direct current system according to the practice of the first networks. Because of the big distance between the power plant and the locale of consumption only high-voltage power transformation could be applied. The examples of that were the latest alternating current high-voltage power transformation systems of the age, but the almost exclusive application of direct current had an effect, so as a compromise the high-voltage Thury-system was chosen, which was followed by alternating current power transformation later.

2. The history of the power station of Ikervár proves according to the sources processed that the application of electric energy made both industrial and agricultural production more up-to-date and safer. It could be experienced first of all in the fields of electric ploughing, threshing and milling industry. It proved to be safer and more effective opposed to earlier steam-engine drive.

3. The history of the power plant of Ikervár is a good evidence of the excellent work of the Hungarian engineers and inventors because out of the 120 year long operation of the power plant, it was operated by the series connection direct current system of Swiss origin only in the first 3 decades, but it was finally changed for the parallel connection alternating current transformation system of Zipernowsky, Déri and Bláthy. The history of the power plant demonstrates well the fight between direct current and alternating current, which was won by the alternating current power transformation of the Hungarian inventors. The quality of the Hungarian engineering work is demonstrated by the fact that only three big repairs had to be made during 120 years – and those were made because of technical modernization and more effective production.

4. The power plant of Ikervár built partly from Swiss capital and with Swiss technology and its power distribution system show the different economic development of the different regions of the historical Hungary. A

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4. A történelmi Magyarország különböző területeinek eltérő jellegű gazdasági fejlődését mutatja a részben svájci tőkével és svájci technológiával épített Ikervári Erőmű és áramelosztó rendszere. Jó összehasonlítást kínál az Erdélyben, Nagyszebenben az ikervárihoz hasonló, ugyanabban az időben (1896) épített vízerőmű beruházása. Míg Nagyszebenben a beruházást a város (zömmel szász nemzetiségű) polgársága kezdeményezte és finanszírozta, a Dunántúlon tőkeerővel a nagybirtokok rendelkeztek és a kezdeményező az arisztokrácia volt, amely gyengébb tőkeerejét külföldi tőkével egészítette ki. Ez magyarázatot ad arra, hogy Nagyszebenben miért a váltakozóáramú magyar villamos berendezést (Ganz), Ikerváron miért a svájci egyenáramút (Thury) építették be.

5. Napjainkban, a 21. század elején visszatér az elektrotechnikába az egyenáramú, nagyfeszültségű erőátvitel, félvezetős egyenirányítókkal. Megállapíthatjuk, hogy a 120 éve épített ikervári egyenáramú, nagyfeszültségű erőátvitel a mai legkorszerűbb rendszernek világviszonylatban is ritkaságnak számító elődje, kiemelkedő értékű technikatörténelmi emlék.

utilization of the energy produced in several ways and the description of the effects of the great turning points of history on the power station in a chronological order. The excellence of the engineers' work is proved by the fact that only three major reparations had to be done during the 100 year long period from its construction, which I also tried to show in the dissertation.

4. Theses (Hungarian)

I summarize the theses of the dissertation as follows:

1. Az erőmű története jól mutatja az elektrotechnika 19. század végi fejlődését. Kezdetben egyenáramú rendszert alkalmaztak, az első hálózatok gyakorlatának megfelelően. Az erőmű és a felhasználási helyek közötti távolság miatt csakis nagyfeszültségű erőátvitel jöhetett szóba. Erre a kor legújabb, váltakozóáramú, nagyfeszültségű erőátviteli rendszerei mutattak példát, de még hatott az egyenáram szinte kizárólagos alkalmazása, ezért kompromisszumként az egyenáramú, nagyfeszültségű Thury-rendszert választották, amelyet később felváltott a váltakozóáramú erőátvitel.
2. Az ikervári erőmű története a feldolgozott források tanúsága szerint bizonyítja, hogy a villamos energia alkalmazásával mind az ipari, mind a mezőgazdasági termelés korszerűbbé és biztonságosabbá vált. Ez elsősorban az elektromos szántás, cséplés és a malomipar területén mutatkozott meg. Biztonságosabbnak és hatékonyabbnak bizonyult a korábbi gőzgépes hajtásokkal szemben.
3. Az ikervári erőmű története bizonyítéka a magyar mérnökök és feltalálók kiváló munkájának, hiszen az erőmű közel 120 éves működéséből csak az első 3 évtizedben működött a svájci eredetű, soros elosztású, egyenáramú erőátviteli rendszerrel és svájci generátorokkal, ezt azonban végérvényesen Zipernowsky, Déri és Bláthy párhuzamos elosztású váltakozóáramú rendszere váltotta fel. Az erőmű története jól demonstrálja az egyenáram és a váltakozóáram harcát, amelyből a magyar feltalálók váltakozóáramú erőátvitelre került ki győztesen. A magyar műszaki munka minőségét mutatja az is, hogy 120 év alatt mindössze háromszor kellett igazán nagy javításokat elvégezni rajta – azokat is főképp a technikai korszerűsítés és a hatékonyabb termelés biztosításának érdekében.

1. The Research Topic

The processing of the construction and the history of the Hydroelectric Power Station of Ikervár in the period from the first steps to the 100th anniversary of the power station.

1.2. The Reason for the Choice of the Topic

In Hungarian public and higher education there is very little space for the history of technics and its teaching, although the Hungarian engineers and inventors have belonged to the front sector for centuries, several of their inventions or their influence play significant roles even today.

The dissertation would like to focus on this situation with the presentation of the history of the Hydroelectric Power Station of Ikervár, which was a monumental engineering work. This power station was the first one of its kind in Hungary which produced electricity using the power of water contributing in this way to development, modernization and making people's lives more comfortable.

The works published so far have been of engineering character, which means that they presented mainly the construction and operation and the utilization possibilities of the energy produced but they have not dealt with the power station itself, its construction or history. That is why I thought it would be worth studying the power station from this point of view as well.

2. The Antecedents of the Research

As I found only few publications which I could use as a help, I started my research in the Archives of Vas County, where I had the chance to study among others different documents, records, reports of the supervision board and annual settlements of the Electricity Works Share Company of Vasvár County besides the documents of the Court of Registration of the Court of Justice of Szombathely, from which I could form a conception about the life of the company which operated the power station and the impacts of the turning points of history on it.

As it is a large-scale engineering work which influenced the people's lives fundamentally, I considered it to be important to study the printed matters of the age, to make the knowledge gained wider or more precise with their help. I could realize it with the help of the microfilm repository of Dániel Berzsenyi Library where I studied the magazines below:

Rábavidék
Szombathelyi Újság
Szombathelyi Friss Újság
Sárvár Vidéki Hírlap
Vasmegyei Lapok
Vasvármegye
Szabad Vasmegye
Vasmegye
Vas Népe

Besides this I tried to gain further information with the help of the internet and I visited the power station as well.

2.1. A Short Historical Survey

Hungary has always been rather an agricultural country because of its geographical character and it has always had much less developed industry than agriculture. This situation was enhanced by the historical position of the country as well: both as part of the Habsburg Empire and as one of the countries of the Austro-Hungarian Monarchy was always at a disadvantage compared to the more developed Czech or Austrian industry. They tried to change this situation in the Reform Period, but the possibility of real development came only after the Compromise, during which Hungary took over foreign experience and technology and in several cases the Hungarian engineers and inventors contributed to development through their inventions. As a consequence of all this Hungary became an agricultural-industrial country by the turn of the centuries, which was greatly promoted by the industry supporting policy of the governments, too.

One of the applied foreign experiences was the utilization of the power of water to produce electricity and these experiences and the technology

adopted from abroad encouraged the construction of the Power Station of Ikervár.

2.2. The Aim and Applicability of the Dissertation

The dissertation attempts to present the history of the first power station of Hungary which used the power of water to produce electricity proving in this way that it is necessary to study technics which gets unfairly little publicity even today and to publish the results in an even wider circle.

I consider it important that these results should be available for non-professional people who are interested in this topic besides professionals, so I tried to write the dissertation in a more readable way to make it more receptive and to colour it with photos taken personally on the spot, which can be found at the end of the dissertation. I also considered it important to introduce the persons who played important roles in the construction and the operation of the power station with short biographies.

The dissertation belongs to the topic of the history of technics and industry, but I think it can be used both in the teaching of history and the history of education as well for the illustration of the technical level, the economical development of the country of that time.

3. The Structure of the Dissertation

The dissertation tries to show the history of the Hydroelectric Power Station of Ikervár during the period from the beginning, the first steps to its 100th anniversary of its existence.

To help that it shows first of all mainly the economic situation of Hungary of the age, the creation of the circumstances which helped the establishment of the power station and the foreign experiences as well.

It is followed by the introduction of the antecedents, the watermills, then the description of the nearby area: Vasvár County and Ikervár settlement, and the description of the beginning steps and the establishment of the Electricity Works Share Company of Vasvár County.

The short description of the building of the power station is followed by the expansion of the territory involved in energy supply, the possibilities of the