

WALTER FASNACHT

Who would be interested in old water wells ?

An interdisciplinary approach to 5000 years of history of water in Cyprus

Abstract

Old and abandoned water wells are still visible all over Cyprus, sometimes in prominent positions within the landscape. Efforts were made to preserve the wells, even amidst modern buildings. But why would an archaeologist be interested in water wells of just a few hundred years of age? Water and its importance accompanies any archaeologist working in Cyprus, daily, or in times of shortage, even in the night.

The idea of envisaging a field project on water wells came up one early morning driving to Larnaca to fetch students at the airport. On the highway, shortly after the Alampra intersection, the sun was just about to rise, the haze was still hiding the harvested dry fields, and the only thing sticking out of the haze in the beautiful plain between Dali and Lympia were the slim Cypress trees next to the sturdy the old water wells!

An initial project was launched in summer 2006, with students from the Inter-Community School of Zurich, ICSZ, Switzerland. We were actually working on iron smithing hearths at the PASYDY project in Nicosia for which we would like to express our sincere thanks to the director of the Department of Antiquities, Dr. Pavlos Flourentzos, and to Dr. Despo Pilides, the director of the excavation. Members of the ICSZ team were the students Luke Evans, Christopher Fougner, Sjoerd Miedema, Rafael Moraes, Ludwig Prade, science teacher Graham Gardner, the archaeologist Christina Peege and the author. The team's quarter was the Elementary School of Mathiatis village. Many thanks are due to our hosts, our cook Mrs. Rodulla, the teachers of Mathiatis and its mayor, Mr. Andreas Panayides.

Only preliminary results can be presented here, a full project is planned in the coming years, involving historical and ethnographic investigation into the use of water, irrigation technology, legal questions of drilling for water and its distribution as well as the conservation of installations, from old and abandoned donkey driven water (pl. XIII a,b) wells to wind (pl. XIV a) mills and diesel pumps (pl. XIV b). The area of focus are the smooth hills and the shallow valleys of Sia/Mathiatis/Agia Varvara/Alampra in the Nicosia district.

Goals and Methods

The area chosen for this project is well known to the author: He has been directing the archaeometallurgical project at Agia Varvara-ALMYRAS, representative of the most complete chain of metal production in ancient Cyprus since 1988 (<http://home.tiscalinet.ch/almyras>). On the basis of the knowledge acquired over the last 20 years in archaeological, geological and metallurgical research, a study of the still existing old water wells - and ultimately the history of water use of the last 5000 years in the chosen area.

The Almyras team has been involved with water research, rather accidentally and initial water analysis were carried out by the Institute of Inorganic Chemistry of the University of Zurich on the request of local farmers: They detected exceptionally high boron contents in the water of some newly drilled deeper private wells on the outskirts of the villages. The farmers were faced with the fact that their newly acquired water could only keep their olive trees alive – every other tree would die after just a few years. Whether this is due to enrichment of the soil of boron or simply salt (cf. the paralleled high chlorine content in table 1), is a question to be answered by botanists.

As excavators of the site of copper working at Agia Varvara-Almyras, in the area of these recent wells, we were interested in the topic of salted water in connection with the etymology of the word ALMYRAS (*almyras/almyros* as opposed to *armiras* in older maps). Rather as a matter of interest, a sample from Alassa from the inner Troodos, with a completely different geology, was included in the analysis. It shows by far the lowest content in all three elements.

It is interesting to see that trace elements in water seem to define the water of a specific village like fingerprints. This means that the local geology does vary quite a bit, a phenomenon we already know from the copper smelting slag, giving specific fingerprints for each and every ancient slag heap!

Provenance of water sample	Cl ⁻ ppm	S04 ⁻ ppm	B3 ⁻ ppb
Alampra, private house, from tank	102	90	170
Alampra, running cold water	106	103	184
Alampra, private house, from tank	100	78	214
Alampra, private house, from tank	111	96	182
Alampra, running cold water	112	160	118
Alampra, private house, from tank	108	120	132
Alampra, farmhouse, private well	5100	600	3860
Alampra, farmhouse, private well	3700	100	4680
Agia Varvara, farmhouse, private well	2800	240	1890
Agia Varvara, running cold water	227	152	206
Agia Varvara, private well	225	100	188
Alassa, Troodos, running cold water	48	43	24
Lefkosia, private house, from tank	660	158	184
Lefkosia, private house, from tank	480	196	288
Lemessos, public fountain	608	563	240
Agia Napa, public fountain	240	70	302
Larnaca, public fountain	113	150	272
Paralimni, farm, private well	230	105	306

Table 1: Chlorine, sulphur and boron content in water from various proveniences.

Note that boron is given in ppb (parts per billion), whereas chlorine and sulphur is in ppm (parts per million). Analysis by Institute of Inorganic Chemistry, University of Zurich, Switzerland, 1993.

The research of water in Cyprus has a long tradition. Geologists, hydrologists, ecologists and even archaeologists have studied the topic from various points of view. The geology and geochemistry of the Sha/Mathiatis/Agia Varvara area has been studied by several specialists, over the last four decades at least. The approach of the project presented here is slightly different to what has been applied to similar archaeo-ethnographic projects so far. Projects such as the one by a French team (Lécuyer 2002) focussed on geoarchaeological/geomorphological and analytical research.

The focus of this new project, however, will be an ethnographic/historical rather than a chemical/analytical one: The first and foremost goal is to save - as quickly as possible - what is still there, in terms of actual evidence of old water pumping installations and - as important - of the knowledge of when and how they were built and operated.

It is our goal to emphasize the importance of preserving old water wells as a vital part of cultural heritage of Cyprus. In the last 50 years, not just the water wells went out of use: by condemning water to invisibility until the turning of the tap in our homes, the respect of water as the most important resource of mankind went lost as well.

Our research goals include:

1. The documentation of the still existing, some times decaying remains of water wells of any age in a specific and well-defined area of Cyprus.
2. Together with this initial effort of recording the wells physically, interviews with the oldest community members will be initiated, as they are the ones who do not just remember the installation of running water in the villages some 50 years ago but actually lived the time before and therefore used the old wells.
3. A survey of still existing official documents will be carried out, i.e. gathering aerial photographs of different ages, agricultural and legal data, maps, plans etc.
4. Collecting already existing geo-chemical data of water analysis.
5. Initiating new chemical analyses such as trace element and isotope analysis, for investigation of pollution indicators and long term/long distance movement of water. It is hoped that scientific analysis will contribute to a better understanding of the present state of water quality in the old wells and, in the worst case, to find out whether abandoned open water wells are a hazard to water quality of their own.
6. In the community of Agia Varvara, there is a folk museum with the oldest diesel driven flower mills of Cyprus. This engine also pumped water and pressed olive oil. A thorough study of the entire museum and its history will be carried out.
7. The folk art linked with water, songs, poetry and the religious use of water as a healing force, as for ophthalmology in the Monastery of Agia Thekla, will be studied.

During more than 20 years of research on ancient copper in Cyprus, it became evident that research and physical work in any section of cultural heritage should now concentrate on the

assessment, documentation and protection of the remains of all periods. With Cyprus now in the EU, the process of urbanization is accelerating and any unspectacular or financially uninteresting part of cultural heritage may be disappearing, in the landscape and, probably worse, in the head of people. Erosion, thoughtless removing and the use of agricultural land for building call for immediate research and investment in the protection of old water installations.

First results

We started with just taking photos of the most prominent – or most beautiful – water installations in the Mathiatis area. Rough measurements allowed a reconstruction in 3D-imaging, carried out on any available program for high school students. The exact dating of wells is certainly possible through written or oral memory, or even dendrochronology on oak beams of donkey driven wells still in situ!

A research project on water wells in an ancient copper producing area will inherently encounter new archaeological finds of all periods, either from settlements, tombs or from sites of copper working. As the surveying of this area was started over 25 years ago by the present author, a considerable amount of information has already been gathered. Long-term experience has taught us to be prepared for finds dating from the Geometric period to Byzantine/Medieval times. Neolithic – now even pre-Neolithic – and Bronze Age settlements existed in the Area, but to find evidence on the surface is very rare. All archaeological finds will be left untouched and reported to the Department of Antiquities.

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The Akrotiri Aquifer (Cyprus)



a: A preserved and protected water well at the entrance of Mathiatis Village.



b: The well preserved mechanism of an old water well near Agia Varvara.



a: A windmill used to pump water for agriculture just a few decades ago. Now it is out of order - but no less attractive for high school students. Sia-Mathiatis area.



b: One of the many still active diesel pumps for irrigation. Sia-Mathiatis area.