

TIMS E-NEWS

The International Molinological Society

Fall/ Winter 2013

Issue 15

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INTRO BY OUR PRESIDENT

Dear TIMS Members and Mill Friends,

If you happen to come close to Nurnberg in Germany, a visit to the village of Möhrendorf is a must. This village is situated about 20 km north of Nurnberg. In the period from May to September one can admire the water lifting wheels along the river Regnitz, which are working day and night. These wheels are maintained by a small group of enthusiasts and sponsors, keeping alive a 600 years old tradition. We were very much impressed with the result. For more information and some interesting photographs have a look at the article in this newsletter.

In a couple of weeks the TIMS Mid-Term Tour in Greece will start. The participants will experience many molinological highlights. But that's not all. Greece is well-known for their hospitality and their Mediterranean cuisine. An article by George Speis on "The Mediterranean cuisine and the oil mills" will give you an idea what can be expected.

For your agenda, I would like to point out that the TIMS Symposium in Sibiu in Romania has been scheduled from the 6th to the 14th of June 2015.

Latest news here is that we are working on mill tours which will take us to the western and the northern part of Romania and possibly Hungary.

Not a member of TIMS yet? Well, it is easy to enroll, just complete the [on-line application form](#)..... as a member you will receive twice a year our magazin „International Molinology" as well as all new issues of our "Bibliotheca Molinologica" series.

Do you want to be active inside TIMS? Just let us know by writing a short e-mail to me or Tarcis, our secretary (e-mail: tims-secretary@molinology.org).

Enjoy reading the E-News !!

Willem van Bergen

e-mail: wdvb@gmx.de



UK Benenden
Windmill



Belgium-
Leffinge



US San Francis-
co- Golden Gate
Park

NATIONAL MILL DAYS FRANCE

17th and 18th May 2014

The 20th edition of “Mills and Mill Heritage Days”



In 1995, collectively and for public interest the Federation, aiming to study and contribute to public knowledge, to help safeguard and promote mill heritage, launched its first national Mills days.

The French Mill Federation (FDMF) since several years now, promote the third weekend of May, which is an occasion to celebrate all the different French mills but also ancient millstone quarries and productive mills including small hydropower plants.

Having noticed that many European countries have the same approach in May: at different dates to the French mills days in most cases, it was suggested in partnership with other European associations to enroll national mills days within the

framework of the European May Mills Month (“Mai européen des Moulins”, M.E.M).

If there are any European association leaders acknowledging this information and who find an interest in the idea, please contact Alain Eyquem, president (mail to: alain.eyquem@sfr.fr or mail to: contact@fdmf.fr) or Bridget Petit, in charge of European relations (auxilium34@gmail.com).

In the meantime, the French Mill Federation would like to invite all those who wish to promote their National May Mills days abroad, to share their May 2014 dates, photos and events posters for publication on our websites: www.fdmf.fr and www.journees-europeennes-des-moulins.org.

BRIDGET PETIT (Conseillère d’administration à la FDMF, chargée des Journées Européennes des Moulins et du Patrimoine Meulier et des relations européennes)

Auxilium

Chemin de la Capitelle

34600 Bédarieux (France)

33(0)6 19 62 03 89

journees.des.moulins@gmail.com

or

DOMINIQUE CHARPENTIER, (Secrétariat Fédération Des Moulins de France,

Chargée des Journées Européennes des Moulins et du Patrimoine Meulier)

Moulin de La Barthe

33540 BLASIMON (France)

33 (0)6 21 68 41 07 or 33 (0)9 63 27 96 90

journees.des.moulins@gmail.com.



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THE TIMS BOOKSHOP

Our bookshop and more... you can find it [here](#):

For more than two years the Mills Archive in the UK has managed the TIMS Bookshop on our behalf. In that time we have raised hundred of pounds by selling our publications not only to members, but also to the general public around the world. The bookshop (below) is on the Internet at: <http://shop.millsarchivetrust.org/home.php?cat=27>

THE NEXT ISSUE OF INTERNATIONAL MOLINOLOGY (IM)

Summary of the main articles in IM 87 to be published in December 2013

The Windmills in the Holmogory District of Russia: Monuments of age-old Dutch-Russian Cultural Contacts, by Piet Schiereck, Alexander Davydov, Paul Groen.

The first contacts between Dutch merchants and the Russian settlements, such as Holmogory, around the White Sea in the 16th century are described together with the founding of the town of Archangelsk. Although post windmills were known in North Russia, Dutch immigrants introduced the design of the smock mill prior to the beginning of the 17th century. The type of smock mill built in Northern Russia is examined in detail and comparisons made with contemporary Dutch practice. The surviving examples of these smock mills are shown now to be only the mills at Rodvina Gora and the mill from Bor, which is now in a museum. The state of these two remaining mills is described, including an unusual sack hoist mechanism, and arguments for their restoration made. Technical drawings have been made for the restoration of the mill from Bor to working order and the dimension used to calculate the dynamic parameters of the mill.

The History of the World's First Wind-driven Hemp Stamping Mill, by Leo den Engelse, Margreet Hoek, Flip Verduin and Pieter Schotsman.

The relationship between the development of the eight sided smock mill and the emergence of industrial windmills in Alkmaar has been described previously (IM 80). Here that relationship is shown to have produced the first wind powered hemp mill in 1591. Unfortunately, the peace of 1609 reduced the demand for ropes and sails and so the first hemp mill closed. The reasons why it did not resume when demand returned and numerous hemp mills were constructed elsewhere is explored. The central role of the Alkmaar millwright, Jan Claesen, and his collaboration with the inventors of various industrial processes to produce a variety of industrial windmills is described and his contribution to the Dutch wind driven industrial revolution of the early 17th century evaluated. When the first hemp mill was sold and removed from Alkmaar its trail is followed to Amsterdam where it was converted to a fulling mill, being immortalized in sketch by Rembrandt.

Mill Performance on Andros in the 1930s and 1940s, by George Speis.

This article is based on the analysis of documents dating from the occupation of the Greek Island of Andros during the Second World War when the Italian authorities were monitoring the production and processing of food throughout the country. The figures show a considerable discrepancy from the widely held figure for the flour production of waterpowered mills in Greece. Other documents available from this time, such as the "Workshop Book" and the "Mills Record Book" for a water and diesel powered flour mill and machine workshop on the island, together with oral testimony, raise questions about the evolution of technology in Greece.

The Bombardment and Rebuilding of the Mills of Antalya, Turkey, by Hüseyin Çimrin.

Most readers will have heard of the Gallipoli Campaign during the First World

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War but will not be aware that hostilities continued after Gallipoli with a blockade of the coast of Turkey by French warships. At Antalya on the southern coast of Turkey the cliffs surrounding the city were ideal locations for watermills to exploit the large head available as streams fell into the sea. Unfortunately their location made them easy targets for the French warships who shelled these coastal mills in 1916. After the war the mill at Antanya harbour was rebuilt by the Turkish authorities in spite of considerable opposition from those privately owned mills located further from the coast that had survived the war intact. Some of these mills survive today although all production ceased in the 1960s. Recently one of these mills has been renovated to illustrate Antalya's milling heritage.

'Oeconomical' Grinding in England - A West-Country Trial, by Owen Ward.

In the latter half of the 18th century, César Bucquet was appointed to provide flour in the Hôpital Général in Paris to feed those unfortunate to be inmates there (i.e. beggars, vagrants, lunatics and the 'incorrigible'). He introduced a system of 'oeconomical' milling to increase the yield of flour produced. This consisted of setting the millstones with a large gap and re-grinding some of the resultant meal where necessary. This method came to the attention of the Bath and West Society in 1788, who held their own tests on this method of milling, and figures are provided which show the basis for their conclusions.

There will also be the usual short items of mill interest from around the world plus book reviews.

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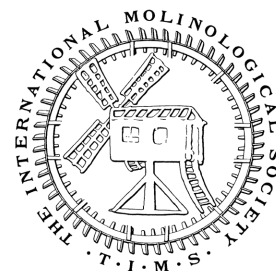
Membership dues can be found [here](#).

Payments can be made to your country's representative or the TIMS treasurer. Click [here](#) to find your representative.

TIMS PRESENTATION

Do you want to learn more about TIMS? Do you have an organization or group of interested Molinologists?

Click [here](#) for our new presentation of TIMS. Please show to as many people as possible. Thanks to our TIMS president for putting this together. Help spread the news!



NEWS FROM AROUND THE WORLD

GREECE

Greek TIMS team trip in Kea

In April there was a trip in the island of Kea by the Greek TIMS team.

The visit included - walking down the watermill valley with its 11 watermills



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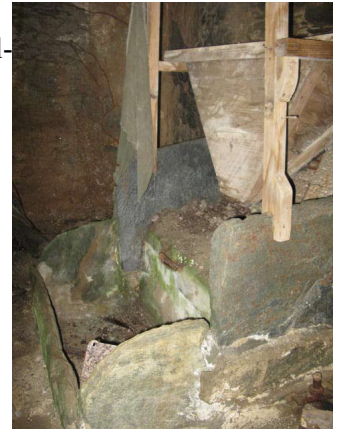
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-walking around the windmills on the top of the village



-visit to two hand driven oilmills (one in a cave)



-visit to the horizontal windmill of Kea, the only one of its kind



-visit to a windmill on the plateau of the island with the millers house

- visit to the windmill in Kato Meria

For all these GPS coordinates were taken.

SPAIN

Tilting at Mills

Almería Colloquium 5th-8th March 2014

This is to invite you to the above colloquium. It follows the highly successful colloquia held at La-Ferté-sous-Jouarre (2002), Grenoble (2005), Rome (2009) and Bergen (2011). The proceedings will open on the evening of 5th March with a keynote lecture (lecturer to be advised) and will be followed by two days of papers and posters. The final day (8th March) will be devoted to an excursion

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to the Prehistoric settlement of Los Millares and to Roman quern quarries in the volcanic district of Cabo de Gata is planned for the last day (Saturday). After this the colloquium will close. The conference will take place in the Museo Arqueológico of Almería with the kind permission of the Consejería de Cultura, Junta de Andalucía.

There are numerous hotels in Almería, but the Vita Gran Hotel, Avenida Reina Regente, 8, is nearby and has been designated as the conference hotel. Special rates: €55 single, €60 double (using keyword: colloquium millstones). There are many alternatives and a list can be sent on request. Almería is popular with budget airlines such as EasyJet, Vueling, Air Berlin, etc., but is served by frequent Iberia flights from the Madrid hub, which connects with all major cities in Europe. Alternatively it is possible to fly to Malaga, Murcia or Granada and take the comfortable and very reasonable express bus to Almería (details www.alsa.es).

A registration fee of € 55 or £50 is required and papers or posters cannot be accepted until this is received.

The colloquium will follow the pattern established at La-Ferté, Grenoble, Rome and Bergen, with the following broad themes:

1. Ancient, medieval and recent millstone quarries
2. Quality, production and trade in querns and millstones. Economic quantification. To include archaeometrical studies.
3. Millstones in action: agriculture, ore processing, glass making. To include ethnographic studies.
4. Protection and evaluation of millstone quarries
5. Poster sessions

These themes are intended to be indicative, but there will be no restrictions on other topics being included and there will be no chronological constraints.

20 minutes maximum is allocated for individual lectures. If the quantity of contributions exceeds the time available, a selection may be made. The remaining papers can be presented as posters. The colloquium languages will be Spanish, English, Italian, French and German.

The French Groupe Meule is organising another conference in Reims in May 2014 and it may seem that mill conferences are like London busses – after a long wait two come together. However, there are logistical reasons why both must take place in 2014. We have discussed this with the Reims committee and agree that, in this rapidly developing subject, there is scope for two conferences and hope that both will be well attended.

Reims will be focused on the important and innovative work of the Groupe Meule and will consider the period from the Neolithic to AD 1000, principally in France. Almería will be without period restriction and papers ranging from the Palaeolithic to the present day, from any part of the world, will be welcomed.

For the detailed financial information and registration please contact directly: Timothy Anderson, David Peacock and David Williams

Email: millcolloquium2014@gmail.com

Final deadline for abstract submission 15th December 2013

Papers and posters will be published in the conference proceedings.

museo de almería

UNIVERSITY OF
Southampton



UK

Hampshire Mills Group Newsletter



www.hampshagemills.org

We received the Summer 2013 Hampshire Mills Group Newsletter No. 101.

It includes the following news and articles:

-Notes on the H.M.G. Spring Meeting held 16th March 2013

-HMG Members follow the Paper Trail at Frogmore Paper Mill



A uniform layer of fibres in water is channelled on to a moving belt. Photo by Sheila M. Viner

-A Visit to Daniel's Mill By Nigel and Angela Smith



photo by Nigel and Angela Smith

-Mr. Brandrick Digitally Draws the Machinery in Hockley Mill By Peter Mobbs



Digital drawings

-A Surprising Day Down Bristol Way - as the Chattering Damsel Discovered

-Hampshire Mills Group Membership News and Summer Events Diary

-Various mill news including information on the Mills Research Group Conference which will take place at Totton on Saturday 28th September

-Also poetry, a Sizzling Summer Soup Recipe, Sizzling Summer Brainteasers and Book Reviews.

USA

TIDE MILL INSTITUTE Summer 2013

www.tidemillinstitute.org



SAVE THE DATES

2013 – November 2 - Ellsworth Maine - PENOBSCOT MARINE MUSEUM - "Working the Bay: Fisheries, Tides and Wind" Looking at how residents of coastal Maine have reaped the sea's bounty of fish, converted the tide's energy into power for mills and harnessed the wind to transport goods to market. A look at current innovations in wind-powered energy tide and wind as alternative energy sources.

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2013 – November 8/9 Topsfield, Mass. GOULD BARN TOPSFIELD HISTORICAL SOCIETY - TIDE MILL INSTITUTE'S 9TH ANNUAL CONFERENCE. Tide Mills of Brooklyn's Gowanus Canal, Nova Scotia's Apple River Tide Mill, Calculating the Power Developed at Tide-Powered Saw Mills and other tidally molinological topics.

2014 – May 15, 16 – Portland & Bath, Maine SOCIETY FOR INDUSTRIAL ENGINEERING (SIA'S Annual Conference. May 16th – SIA Splinter Meeting at MAINE MARITIME MUSEUM in Bath – Bud Warren will offer a presentation: Maine Tide Mills: A Once and Future Thing.

SPRING 2014 – Date to be Determined. Queens, New York GREATER ASTORIA HISTORICAL SOCIETY. Empowered by the success of Tide Mill Institute's conferences, this organization is in the planning stage for their first tide mill conference. From what we understand, it will focus on both the extensive tide mill heritage that grew out of the Dutch tradition and will explore some contemporary New York tidal energy installations.

The latest issue of Tide Mill Times in its 11 pages includes the following:

1. NEW STRUCTURE FOR TIDE MILL INSTITUTE

A new approach to the form of the TMI is being investigated contemplating the future of the group to attract new people with talents and knowledge after eight years of ever-more successful conferences.

2. TMI'S BROAD ROLE

Besides the main missions already set a new emphasis is placed on the oral history to dig deeper to get the full story. So "We can help you pinpoint your mills, but only you can tell their real story."

3. TIDE MILL PEOPLE– Dedicated to Perveril Meigs and David Plunkett

4. WINNEGANCE FOLLOWUP

Winnegance area of Bath and Phippsburg, Maine is a major hub of the nineteenth-century tidal power industry. There is a great effort by John Goff to mobilize the local community in developing and preserving the local endangered tide mill sites. This effort seems to have created a local momentum.



5. TIDE MILLS GREW IN BROOKLYN

Brooklyn was the site of some of the earliest tide mills in the country. Dutch settlers brought their milling expertise to the new land and took advantage of the area's tides and topography. In the mid 1640's three of them were built on Gowanus Creek. By 1836 three tide mills were still in operation along Gowanus Creek, but they didn't last long, for the Erie Canal allowed inexpensive grain to be brought from upstate New York and the Midwest. As elsewhere, these mills changed ownership through the years, ceased operation and eventually fell into disrepair.

Proteus Gowanus is an interdisciplinary neighborhood gallery and reading room. To bring attention to the tidal nature of the water in the Creek, Angela Kramer painted tidal height markers on old pilings. She also created an exhibit highlighting the history of the Gowanus mills and hosted a "Tide Mill Extravaganza Workshop," focusing on the old mills, milling and the current situation along the Gowanus waterfront. Families in the area worked together to build their own miniature mills, and youngsters even had the opportunity to grind grain into flour. At the conference in November, she will share the story of those early Dutch mills.

6. THIS ISSUE'S TIDE MILL – Brooksville Maine

Here it is the story of a tidemill area turned to an open pit mine and then, after the exhaustion of the mine, the restoration of the environment to its former glory in Brooksville near the mouth of Maine's Penobscot River.

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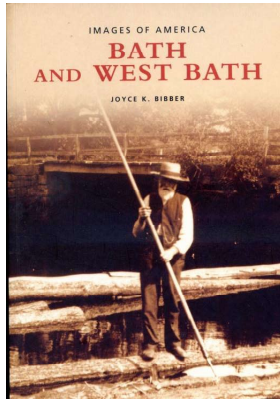
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7. TIDE MILLER ON THE COVER



In the book “Images of America” series, there is an image of the cover of a real tide miller posing for the camera. The caption from page 52 of this volume reads as follows: “Logs on the millpond. Lumbering was one of the earliest industries to develop in Maine, and the Bath area usually had at least one mill. The availability of timbers helped contribute to the development of Bath as a shipbuilding center of shipping. The Rogers Mill was built in the nineteenth century on the site of the 1764 sawmill built by Dummer Sewall at Whiskeag Stream, in the north part of town. Mr. Rogers is shown here lining up logs.”

Since there are few existing photographs of tide millers at work or of the interior of active American tide mills, if anyone has any to share, please send them along or email them to TIDE MILL TIMES: 5 Berkeley Lane- Topsham ME 04086 budw@myfairpoint.net.

8. TIDE MILL DETAILS: The Dam

Tide mills come in many different shapes and sizes. So do their dams. Here are some photos (reproduced from the Tide Mill Times) of what’s left of a number of them from along the coast of Maine.



CROSBY MILL - ARROWSIC



LOWER HEAL MILL – WESTPORT



PAINE MILL –
WOOLWICH

9. SOUTHER MAKING A SLOW COME BACK



One of the original reasons that John Goff first began publishing TIDE MILL TIMES back in the 1990’s was to publicize the SOUTHER TIDE MILL in Quincy, Massachusetts and to stimulate interest in tide mills. At that time, a saw mill was adjacent to the original grist mill, that dated from 1806. John’s dream was to restore the tired mill buildings mill to working condition and to develop the land around it into a fine park. Today thru efforts, help and grants one can see the difference made.

10. PERKINS GRIST MILL RESTORATION ON TRACK

A reconstruction of the 1749 Perkins Grist Mill in Kennebunkport, Maine. When completed and operating, it will be the first working tide mill in America since the 1940's.

THE NETHERLANDS

EXTRA NIEUWSBRIEF SEPTEMBER
2013



STEM OP UW FAVORIETE
MOLEN EN WIN!

GA NAAR WWW.MOLENPRIJS.NL
BankGiro Loterij Molenprijs 2013

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Molenprijs 2013 van start



Dit jaar strijden zeven molenprojecten om de BankGiro Loterij Molenprijs 2013 ter waarde van € 90.000. Dit jaar doneert u met uw stem direct € 1,- aan uw favoriete project. En u maakt zelf kans op een molenweekend voor 8 personen.

Stemmen kunt u van 1 september tot 1 oktober 2013 op www.molenprijs.nl

Op de foto: De jury van de BankGiro Loterij Molenprijs 2013 op de stelling van een van de genomineerde molens



STEUN DE HOLLANDSCHE MOLEN

Vereniging De Hollandsche Molen, zeeburgerdijk 139, 1095 AA Amsterdam
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ARTICLES AND INFORMATION FROM AROUND THE WORLD

CANADA

Technology transfer related to water-powered mills located on the Chignecto Peninsula, By Kerr Canning.

In 2011, the remains of a water-powered sawmill were discovered along an eroding river bank on a salt marsh in Apple River, Nova Scotia. Since the mill was abandoned in the late 1800's, sea level rise in the Bay of Fundy resulted in silt covering the lower portion of the mill. The wood under this silt covering was oxygen starved and consequently, the wooden mill structure did not decay. Since I retired from teaching physics at the college level, in field work on



Fig.1: Nova Scotia's Chignecto Peninsula

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dykes (sea walls) and aboiteaux (tide gates) where I have been investigating the salt marshes on a section of the Upper Bay of Fundy, called the Chignecto Peninsula (see Fig.1). As a result of the discovery of this mill structure, I am now expanding into mills built in this region..

In examining the technology related to these water-powered mills, questions arise concerning the way in which the early settlers in this region would have acquired the knowledge and skills needed to build these complex structures. It would be interesting to know how the knowledge of watermill and windmill technology was transferred from Europe to North America. The Colonial settlers on North America's Atlantic coast came mainly from Western European countries such as the British Isles, France, Belgium, Holland and Germany; however, along the Chignecto Peninsula, many of the founding settlers arrived in this area after their families had already lived for many generations along the East Coast of the United States (Longley, 1961). In other words, their families would have been in North America since the mid seventeenth century and they would have learned saw mill technology in the United States. Presumably, this would include adaptations that were necessary due to the uniqueness of each coastal region and these skilled people would have made the appropriate changes and improvements.

In addition to the American settlers, there were Acadians (Ross and Alphonse, 1992) who returned to Nova Scotia after the expulsion in 1755. They had worked extensively on these lands before the Diaspora. Furthermore, there was a migration directly to Nova Scotia of people from the agricultural lands of Yorkshire, England (Martin, 2000) where windmills would have been used.

Wind mills do not appear to have been used to any great extent in Nova Scotia, especially wind mills for sawing logs. However, on page 11 in the 1986 Nova Scotia Museum publication *Sawpower: Making Lumber in the Sawmills of Nova Scotia* by B. R. Robertson, one reads the following:

“1753 a windmill for sawing lumber was built in Dartmouth, N.S. It had 18 saws and according to the Halifax Gazette local blacksmith George Gerrish made a seventeen hundredweight (1904 lb) crank for the mill that was considered as well made as any in Holland.”

“In 1788 Scottish shipbuilder and millwright William Lowden settled in Pictou County, N.S. where he constructed two wind powered sawmills. By 1788 Scotland had been using this type of sawmill technology for 150 years, a technology probably imported from France and Holland.”

From these quotes, it can be seen that Dutch Windmills were found in some parts of Nova Scotia in the eighteenth century. It would be interesting to know why this type of sawmill does not appear to have been adapted throughout the province, especially in windy regions. A wind powered mill with 18 saws must have produced far more lumber than a water mill with one saw. In Nova Scotia's tall forests, there would not be sufficient wind; however, at the mouth of the rivers, it is highly likely that there would have been plenty of potential wind power. Often, the logs were cut further inland and floated down river to the mill site, which in theory would have included wind powered sawmills and yet, this does not appear to be the case.

English millwrights, it appears, were not familiar with the technology for water powered sawmills. A web site for the Center for Medieval Studies at the Pennsylvania State University states that

“..water powered sawmills appeared quite early in America as a technical solution to an ecological and human power problem. Many of these early sawmills were built and operated by men who were not English, due to a lack of familiarity and skill level that the English colonists had with this technology. The first colonial sawmill was erected by the Dutch in New Amsterdam in the 1620s. The first English sawmill was built in Maine in 1623 or 1624 and the first sawmill was erected in Pennsylvania in 1662. By 1700 there were about 70 water powered sawmills in New England and 100 years later there were 250”.

E. W. Cooney wrote two articles in which he provides an explanation for what

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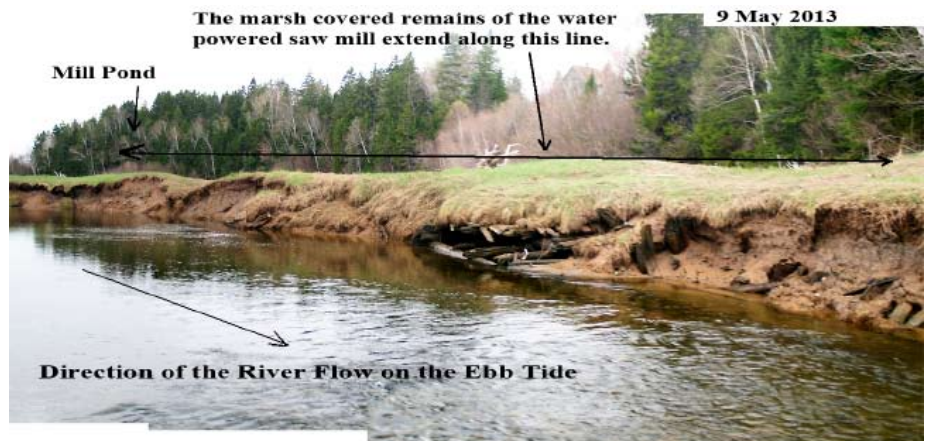
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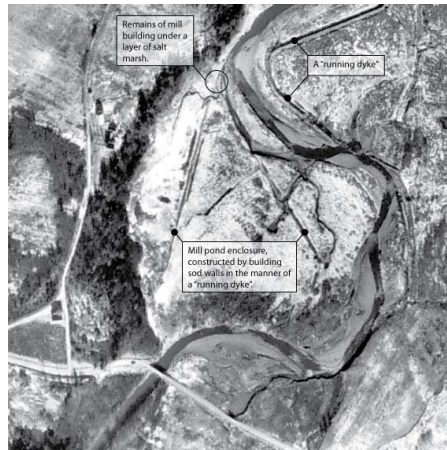
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Mill remains



he refers to as “Eighteenth Century Britain’s Missing Sawmills: A Blessing in Disguise?” (Cooney, 1991; Cooney, 1998).

Water-powered grist mills existed in the Cape Chignecto region as well but I know little about them at this point in time.

This is an area of interest and more research is needed before a comprehensive document can be written on the watermills of this area of Nova Scotia.

This story along with sea level rise is part of my research and is a work in progress. On some of the photographs you will see the term “Mill pond dyke wall”, it is explained as follows: All of the mill components were constructed on a salt marsh located at the tidal limit of the South Branch of the Apple River. The mill owners were craftsmen who were not only familiar with dyking technology and experienced dyke and aboiteau builders. They used this knowledge



and experience to create a mill pond enclosure on the salt marsh by building sod walls in the manner of a running dyke. A running dyke is a section of a dyke that runs from one aboiteau to the next aboiteau.



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20 Aug. 2013: Apple River Watermill Site at a High Spring Tide. All of the mill relics are under water and a section of the mill is also under the salt marsh.



14 May 2011: remains of western arm of the mill pond dyke wall.



Upper Platform supported by a timber cribwork. The platform and cribwork extend at least 6.5' (2 m) into the salt marsh river bank.

Salt Marsh

Direction of the River Flow on the Ebb tide.

12 Aug. 2013

Two platforms at the Apple River watermill site. The upper platform is 2' (0.61m) above the lower platform. The man in the photograph is Professor David Patriquin, retired from Dalhousie University, Halifax, Nova Scotia .

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GERMANY

600 years water-lifting wheels in the valley of the Regnitz, Bavaria, Germany, by Ton Meesters.

This year it was celebrated that since 600 years water-lifting wheels are used in the Regnitztal (valley of the river Regnitz). From the 12th century onwards the population of the German and West European cities grew more and more. For the farmers in dry areas without a lot of rain it was no longer possible to feed all people with the methods used until that period. For this reason an artificial way of watering the meadows of the valley was used. The farmers constructed an easy dam to water their meadows. The population of the cities and villages grew more and more, so a more definite solution was found.

The dams were especially constructed in the upstream part of the river. This method could not be used in the middle stream part of the river which was too wide and too deep. Water-lifting wheels were the solution for the problem. More and more wheels were installed in this part of Bavaria, referred to as Franken. At the golden era of the water-lifting wheels there were more than 250 wheels between the places Schwabach and Forchheim. The farmers with their wheels were not the only persons using the river, as there were fishermen and millers as well. This caused of course a lot of problems and conflicts. The count of Bayreuth solved the problem in 1693 in a law called “the Bayersdorfer Wassergerichtsordnung”, which is still in use today. In this law it is exactly mentioned when the water-lifting wheels may be used. The wheels are allowed from the 30th of April until the 29th of September. At the last date the wheels must be demolished and stored away for the next season. During the winter only the wooden burry can be seen, on which the wheels are mounted.

Until this date it is not known who brought the technique of these wheels to Franken. There are several suggestions made, the first one being of course that the crusaders brought the idea of the wheels back from the Middle East. Another suggestion is that merchants of the city of Nürnberg came with the idea. The wheels are comparable to those used in Mesopotamia with one exception. The buckets which raise the water in Germany are made of wood instead of clay. Until this day almost the whole wheel is made from pine and oak. One wheel has 600 different parts. The following elements are essential for the wheels:

-A dam which raises the water a few centimeters and let the water flow to the water-lifting wheel.

-A burry, which is firmly constructed in the river bed and which is the basis for the water-lifting wheel

-An undershot water-lifting wheel which is driven by the flow of the river. This wheel is equipped with wooden buckets

-In the meadows a canal system for irrigation the land. At present one of these systems is reconstructed. In the early days this was made from wood, since WW II concrete was used.

At present none of these water-lifting wheels are still used for their original purpose. During the 20th century the decline of these wheels started. The final blow was the restructuring of the agriculture by the European Union from small farmers to big agricultural companies using machines intensively. The canal system which was in use until that time prevented these big machines to be used. The whole land had to be remodeled in order to have these machines do their work. At present the mills are a tourist attraction and the landmark of the

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village of Möhrendorf.

At the moment ten water-lifting wheels in Möhrendorf are still to be visited each year. A group of people (only men, but the first woman maybe allowed (!) this year, but is still in the negotiation process) assembled in the Wasserrad-gemeinschaft is keeping the heritage of the water-lifting wheels alive. During winter time eight wheels are stored in a barn owned by Wasserradgemeinschaft and are maintained there. Rotten parts are renewed with new parts. All wheels are of the same construction. Off course there are some differences, for example wheels with two rims of buckets of wheels with only one. The wheels with one rim of buckets are in the majority. In the neighborhood of Möhrendorf one can see some more recent and reconstructed wheels, for example in Bruck.

For those interested in visiting the wheels, please contact Gemeinde Möhrendorf (09131-7551-21). It is also possible to get in contact with the Wasserrad-gemeinschaft, Obmann Thomas Fischer (0172-8445545) or with Rolf Dürschner (09131-41902). Mr. Dürschner, now retired is the man stimulating everyone in the village to preserve the wheels. He has written several publications of the subject. The last one was published this year. If you have the opportunity please visit him, because he will show you the things you would might miss! On YouTube and other social media one can find several movies or pictures of these water-lifting wheels. For my friends and me, it was going back in time for hundreds of years during the two days we spent there. Strolling along the river banks of the Regnitz and seeing al wheels turn is a spectacular sight. It is well worth a visit. Good hotels are available in the village for those who would like to spend the night.



A general view of the “Wässerwiesrad”. In the river we see the dam which raises the water a little bit in order to let it flow to the water-lifting wheel. This wheel has no function any more and the water flows back in the river. Opposite this wheel there used to be another wheel. From Google earth you can still clearly see many spots where wheels and dams were.



A close up of the wheel, showing the buckets that raise the water. All wheels are turning during five months.



Looking downstream at the “Wässerwiesrad”, showing the burrey on which the wheels are mounted. the wheel is of a simple construction but still contains 600 parts...

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A view of a wheel with buckets on the inner and outer rim



As one can see on this picture, the wheels are situated on both sides of the river



The only wheel which still has part of the canal system



The inside of the barn is the only parking place I know for water-lifting wheels!!! Here we see the places for two wheels, every place marked by lines etc, as all wheels have different owners



TIMS members are welcomed by the friendly owner. Many questions are being answered. This wheel is called "Wässerwiesrad".

Mr. Dürschner showing the model of a rim for a water wheel



GREECE

The Morogiannis' watermill: A representative case for the implementation of RESTOR HYDRO project in Greece.

Preface

Renewable Energy Sources Transforming Our Regions (RESTOR Hydro, www.restor-hydro.eu/el/) is a European project aiming at increasing renewable energy production from small and micro hydropower, by identifying and restoring suitable historical sites, mills and hydropower stations that are currently inoperative. RESTOR Hydro aims at assessing the state of small hydropower and refurbishment potential in the whole EU-27 region. Restoration programmes will be implemented in eight selected target countries: Belgium, France, Greece, Italy, Lithuania, Poland, Slovenia and Sweden. Among the project activities is the development of the RESTOR Hydro Map to provide authoritative information on the hydropower potential of historic water wheels and mills, inoperative hydropower stations, weir sites, and other lateral river structures, covering the entire EU-27 region, as well as to develop guide

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lines on how to establish small and micro hydropower cooperatives, with a community shares ownership. The Laboratory of Hydraulic Turbomachines of the School of Mechanical Engineering of the National Technical University of Athens (LHT-NTUA) is the Greek partner of the RESTOR-Hydro project. As that is responsible for the implementation of the project objectives in Greece.

Identification selection of restorable sites

In each target countries a number of sites will be technically investigated so that to choose the best applicable alternative technology that favors the maximum exploitation the available hydro potential. The aim is that the selected traditional watermills to host a state of art and efficient micro hydro system and consequently historic and modern technology to coexist in an attractive and effective way. This technical action, combined with a business plan will then allow the mills owners to invest in modern equipment installation that will eventually generate extra income coming from the selling of electricity.

The candidate restorable sites should fulfill some prerequisites such as the clear ownership status, the factual interest of the mill owner to incorporate a micro hydro in its mill, the availability of flow and head in year round basis, the proximity to the electricity grid, the easy access to the site, the current condition of the mill building and equipment etc.

If a site meets the above requirements, it can be considered as a candidate one to be studied technically. The first step of a technical study incorporates the calculation of the electricity that could be extracted from the site. Thus, a measurement of the flow rate and the head is needed. After the expected electricity generation has been calculated, taking also into consideration the technical characteristics of the micro-hydraulic technology to be applied, the final selection of equipment can be done (i.e. water turbine, electric generator, gear box, coupler, electrical panel, control unit).

In this context the LHT-NTUA working team has inaugurated a number of visits to traditional watermills sites that gather favorable characteristics and could be preconceive as those for an in depth technical study. A useful tool for the selection is of the advantageous sites is the RESTOR Hydro MILLS MAP which provides authoritative information on the hydropower potential of historic sites, covering the entire EU-27 region.

Investigation of implementation sites in Greece: the Morogiannis' watermill

The Morogiannis watermill (Fig. 1) is located at Kato Giannaioi village in Arcadia prefecture.

The Morogiannis mill gathers all the prerequisites so that to be considered as a site for an in depth technical examination. The mill has a clear ownership status and is close to the local electricity grid. The site is neither in a protected area, nor of historical meaning while it can easily be accessed by



Figure 1: The watermill of Morogiannis at Kato Giannaioi village



Figure 2: The internal of Morogiannis watermill. The millstone the grains silo and the flour container are visible.

road. The

owner has signed the letter of intent in order to enter the RESTOR project and he is also willing to become a member of the cooperative that will be created in Greece, to promote refurbishment projects.

The watermill used to grind wheat until the middle of 70s. The mill had been abandoned since then and was rebuilt in 2006 with funds partly coming from an EC grant.

The mill is fully restored and all vital components of traditional equipment are functional (Fig. 2). It is worth to mention that making

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use of the experience of the miller who operated the mill, all the new mill components were manufactured traditionally. Currently, wheat is grinded for demonstration purposes at a capacity of 70 kg/h.

What makes the case of the specific watermill very attractive for RESTOR-Hydro project is that it can be characterized as a very illustrative for the watermills' technology and capacity in Greece. In fact, the work to be done for this mill can be easily replicated to some hundred of mills scattered throughout the Greek territory, those of "vertical axis".

The mill is supplied with water coming from a water source (Fig. 3a) through a concrete channel of 1500 m length, ending to a water charge reservoir (Fig. 3b). The maximum flow rate is about 250 m³/h in early spring while it is reduced to a minimum but continuous flow rate of 50 m³/h in early fall.



Figure 3: (a) the water channel and (b) the water charge reservoir

The available head is about 8 m. Based on this hydraulic inputs, a power generation in the range of 1-4 kW is expected whereas a modern micro hydraulic system is coupled with the traditional arrangement.

The water wheel of Morigiannis mill is of vertical axis which is the predominant variant for water wheel of this size in Greece.

Vertical axis water wheels operate as action turbines and their shape and mode of operation are similar to the modern hydraulic turbine, well known as "Turgo" turbine. More specifically, water is driven to the wheel by a circular pipe. At the end of the pipe a conical nozzle is shaped and therefore, water exits in the form of a jet with high velocity. The jet is directed to the perimeter of the water wheel with an inclination α of the order of $\alpha=20^\circ$. As the jet hits the buckets of the wheel its direction changes, resulting to the development of a peripheral force into the buckets.



Figure 4: The water wheel (1) and the nozzle (2)

This peripheral force finally induces the rotation torque and consequently hydraulic energy is converted to mechanical. The in-site investigation of the watermill revealed some technical interventions that could be adopted so that a modern micro hydraulic system can be installed in the existing infrastructure:

- A new, optimal design of the water wheel will be elaborated in order to increase the efficiency. The watermill is currently equipped with a water wheel empirically manufactured and further optimization is feasible.

- The new water wheel will replace the old one and the variant of being coupled either with the millstone (when grinding is initiated) or with the electric generator should be possible.

- Coupling of the generator with pulleys arrangement to convert the mechanical power to electrical.

Figure 5 depicts schematically the adapted watermill configuration concept, as planned. It can be seen that two pulleys are used to connect the water wheel with the electric generator. Pulleys are used to multiply the rotation speed in the operational ranges of the electric generator, as well.

Apparently, the technical interventions foreseen are of small scale so that not to disturb the historical character of the renovated mill and of low cost. The idea is both the adaptation technical proposition to be attractive in terms of aesthetics

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and cost effectiveness.

Conclusions

Within the framework of RESTOR-Hydro project, several historic watermills site are under investigation in Greece, from the Greek project partner LHT-NTUA. A widespread waterwheel technology is that of vertical axis that resembles to the modern “Turgo” turbine. One representative case that is being technically examined by LHT-NTUA is that of “Morogiannis” watermill. Low budget, small scale technical interventions will grant the incorporation of

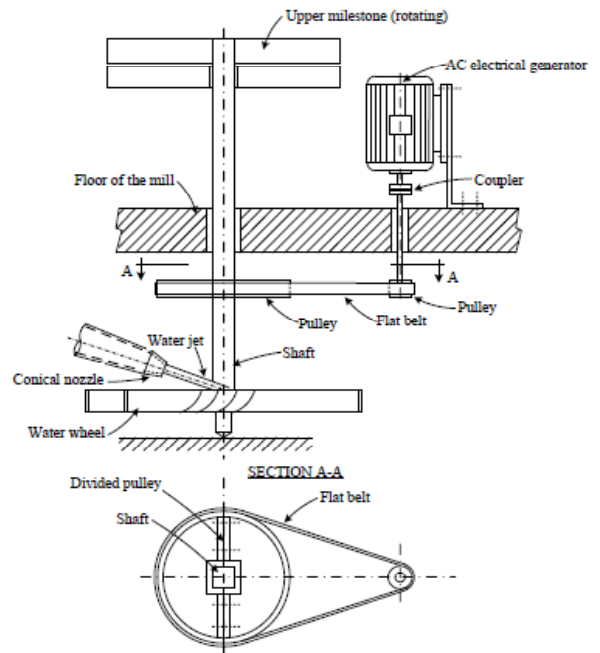


Figure 5: Schematic representation of the of the watermill final design

micro hydraulic system of 1-4 kW in the existing mill equipment. Such technical interventions are concentrated on the provision of a new design waterwheel so that to increase its efficiency, as well as the integration of an electric generator coupled with the water will shaft with a pair of pulleys.

Acknowledgements

The project RESTOR-Hydro is partly financed by Intelligent Energy Europe programme.

Moulds for mills in Andros, by George Speis.

In the island of Andros since the 19th century there was a foundry. It started making oil presses for oil mills. Later, watermill water wheels were cast along with parts of Persian wheels. Off course when the island sailing ship fleet changed to steam, the foundry worked to serve the needs of the steamships. Today the foundry does not exist but most of the equipment and tools survive along with the foundry molds. Below some moulds are presented, they are made out of wood.

On the left the mould for the watermill water wheel. On the right the mould of a wheel for the oil mill press. For this press the owner of the foundry, Stamatis Rasis, got a recognition at the 4th Olympiad in Athens in 1888 (The Olympiads were trade fairs in Athens before the Olympic Games).



The wheel for the oil mill press. Underneath, the mould of $\frac{1}{4}$ of the lower round slab of an oil mill. Notice the grooves to facilitate the crashing of olives. At its center (left corner) there is a hole for the axle around which the two oil mill stones turned.

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Part of a Persian wheel mould. It is the guard and guide for the chain with the water buckets. Its use can be understood by the following picture:



Here one can see the guard and guide for the Persian wheel chain. The water is forced in the small basin in front and thru pipes to the main water basin of the well. It is possible that this was made by this workshop.

The Mediterranean cuisine and the oil mills, by George Speis.

The European Union is the largest consumer of olive oil by 1.3 million tons. In each country the consumption varies. For example, in Greece a major olive oil producer, the olive oil consumption is 23,7 kg per year per capita, while in EU countries where olive oil is not produced, the consumption is limited to only 1 kg per capita [1]. In another study the consumption in Greece is between 22 and 25 kg per capita, which is the largest in the world. [2]

The last few years there is an aggressive campaign for the “Mediterranean cuisine”. One of the key elements is the olive oil. Of course there is some truth to this, but how much truth? An initial answer to this question will be given using some data from Greece. Certainly much more research and information is needed from around the Mediterranean to give a proper answer. I believe the “Mediterranean cuisine”, as promoted, is simply a marketing myth.

Nevertheless it rightly promotes a key staple of the region but by doing this, the rich variety of the real “Mediterranean cuisine” fades away creating dangerous stereotypes in the industrialized society. By developing and promoting a dietary model, in the industrialized societies, the differences from place to place have narrowed down, but even today many exotic local eating habits exist. The explanation is taste has enough resistance and inertia to new eating habits.

The olive oil production in Greece always varied locally. Hence the use and consumption of olive oil also varied. We know that in Northern Greece (Macedonia and Thrace), where the climate does not allow olive tree cultivation, sesame was traditionally used to produce oil. There was no real dividing line since the olive oil production overlapped in many places. Actually in some in between places like Smyrna (Izmir) and the islands of Lesbos and Lemnos, sesame mill byproducts were significant like halva and sesame paste, so that both olive oil and sesame oil were locally produced.

Very important for cooking all over the Greek world, was pig’s fat. Animal fat always supplemented and still is important to the local cuisine. What was the actual proportion of animal fat to vegetable oil, we do not know. There are no relevant data, since animal fat was produced only in every household by the annual slaughtering of the pig. Only olive oil can give us some information since data were recorded thru trade and tax purposes.

So we have production imbalances and use of other vegetable oil and animal fat. This challenges both the olive oil consumption pattern in Greece and the “Mediterranean cuisine” stereotype. To give some more concrete picture of this situation data will be presented for two islands, Andros and Kea, both Cycladic

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islands from olive oil mills.

First of all the cultivation of olive trees in the Cyclades islands compared with other parts of Greece remained insignificant despite all efforts to increase the cultivation after the Greek Independence, almost 200 years ago. During the interwar period, the annual average production of olive oil in Greece was 112,000 tones while the production in Cyclades was 1,000 tons [3]. Also the oil production did not remain stable. We know that in Greece in the 19th century there was an effort by the Greek state to increase oil production. Incentives were given by the 1856 law “On national wild olive tree grafting” and in 1861 by the law “on the disposal of national and ecclesiastical olive trees orchards” giving away olive trees to growers [4].

In Andros and especially in the north western half of the island, there were very few olive trees before the Greek war of Independence. The development of olive tree cultivation in Andros can be indirectly followed by the number of the olive oil mills in the island. Thus we have:

a. From the tax records of 1830 signed by the Andros’ elders, we have the number of oil mills per district [5].

Olive oil mills in Andros (1830)

Chora area (central area)	39
Korthi (SE area)	18
Arnas (Mpatsi) (central- NW area)	4
Amolohos (Gavrion) (NW area)	4
Total	65



b. A 1911 manuscript by the historian Paschalis, states that the Municipality of Andros had 60 olive oil mills [6]. Namely 50% increase in 81 years. This pictures an increase of olive tree cultivation after the destruction of silk industry and the efforts by the Greek state to increase olive oil production.

c. A 1999 survey in the Korthi area recorded 24 olive oil mills, a 30% increase from the 1830 statistics. From part of the area of Chora, the records though incomplete are indicative, 18 vs. 10 from 1830. This is consistent with the growth rate from the Paschalis’ data. If the steam powered olive oil mills are also included (with greater production capacity than the traditional), then surely there is an important increase of olive oil production. In Gavrion and Arnas, the work of the environmental group in the northwest Andros recorded 30 [7] and the 1999 survey added another 10. Thus only in the Arnas area olive oil mills were approximately 40, ie fivefold from the recording of 1830.

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These data confirm the rapid growth of olive tree cultivation in Andros the last 100 years. The survey, by the school children Gavrión, also recorded the oil mill construction dates, placing out of 7 mills, 6 later than 1830 and up to 1900 and only one before 1830. All these verify the statistics.

d. Additional information relevant to Korthi area is also indicative. The almanac of 1938 mentions 3000 inhabitants in the Korthi municipality. This corresponds to 1 olive oil mill per 100 inhabitants. In areas with olive trees cultivation, as Alamania, 30 inhabitants corresponded to 2 olive oil mills, that is 1 mill per 15 inhabitants. In Arnas, the olive tree was not the main occupation, so 120 inhabitants corresponded to 7 oil mills that is 1 mill per 17 inhabitants.

Finally it should be noted that all these olive oil mills did not work simultaneously. The following list was made from data collected in the 1999 survey:

	Olive oil mills in Andros	
	1830	2000
Chora (Central area)	1	?
Messaria (Central area)	4	5
Lamyra (Central area)	17	?
Apikia (Central area)	3	4
Apatouria (Central area)	?	1
Stenies (Central area)	5	2
Vourkoti (Central area)	0	1
Menites (Central area)	6	?
Pitrofos (Central area)	3	5
Pera villages (Central area)	3	2
Korthi (SE area)	2	2
Aidonia (SE area)	1	3
Amonakliou (SE area)	1	1
Kaparia (SE area)	7	9
Aipatia (SE area)	0	1
Rogo & Hones (SE area)	1	3
Piskopio (SE area)	3	3
Amolohos (NW area)	4	23
Arnas (central- NW area)	4	17

Another argument on the oil production capacity variation is given by the following testimony: "Olive oil was produced usually every other year. It was called Gold. So they were storing oil for the following year when production was diminished".

Characteristic to this variation is the publication of the newspaper "Voice of Andros, 8 May 1910 Monday no.492" on agriculture: "The main products of the island are lemons, acorns, figs and oil. The latter due to various climatic reasons has a maximum production every third year. Otherwise the other two years the oil produced is minimal and not sufficient for the island's inhabitants".

So the picture in Andros is described by big olive oil production variation, not sufficient quantity for all the inhabitants, regional variation and olive tree cultivation increase the 100 years following Greek Independence. Also we know animal fat was used for cooking.

In Kea we have a different picture. There, the olive oil mills were always very few and they were using very primitive technology. From the research done, all the olive oil mills were not working simultaneously, some were abandoned earlier and some later. The number 7 is probably about the most correct for simultaneous operation during the interwar period. In 1950, in a population of about 5-7000, 1 olive oil mill corresponded to 1000 inhabitants. The olive processing was 140-210 tons with 20-35 tons of oil production per mill. That is roughly equivalent to 6 kg of olive oil per capita (range 2,9-8,2 Kg).

A very rough calculation (with various population scenarios) shows that the production was not enough in any case to meet the oil needs of the island:

Kg of olives per mill	Oil mills	Kg of olives processed	Kg of oil produced		Inhabitants **	Consumption/ person	
			6 to 1 *	7 to 1		6 to 1	7 to 1
20000	7	140000	23333	20000	7000	3,3	2,9
35000	7	245000	40833	35000	7000	5,8	5,0
20000	7	140000	23333	20000	6000	3,9	3,3
35000	7	245000	40833	35000	6000	6,8	5,8
20000	7	140000	23333	20000	5000	4,7	4,0
35000	7	245000	40833	35000	5000	8,2	7,0

* 6 to 1 mean 6 kg of olives produced 1kg of olive oil.

** The number of inhabitants ranged between 5000 and 7000 residents before the war.

We also know that pork fat was very important for the diet of the island's inhabitants and the rest of the needs were covered by importing olive oil. The imported olive oil was consumed in very small quantities since it was expensive for the poor islanders to buy. One must take into consideration that the traditional society was based on subsistence farming and animal husbandry. Money was circulating only as a surplus commodity to cover luxury and unexpected needs for the majority of the islanders. Thus it was impossible by using local and imported olive oil to reach the Greek stereotype.

From all these we see a different picture than the one projected regarding consumption of olive oil with its many fluctuations over time and localities. Consequently the image of the "Mediterranean cuisine" in the Greek islands, presents a very different picture from the stereotype using olive oil mills data.

Finally there is a need to map the oil production and the use of fats (animal and vegetable) having in mind all types oil mills in the area (olive oil mills, sesame mills and other types found), since oil trade distorts the real production picture.



Andros (Piskopio) olive oil mill



Kea olive oil mill

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BOOK REVIEWS AND BOOK PRESENTATION

Windmühlen by Helmut Dollhopf -**Now for sale !!**

In E-News 12, Helmut Dollhopf's book Windmühlen was introduced as a beautiful book with many excellent (mostly in color) photographs of mills in Germany, Holland, Belgium, France, UK, Denmark, Sweden, Estonia, Poland, Ukraine, Czechia, Austria, Hungary, Romania, Greece, Turkey, Italy, Malta, Spain and Portugal (incl. the Azores).

The bad news is that the publishing company has gone bankrupt

The good news is that the books can now be ordered directly from Helmut Dollhopf with a **discount of almost 60%** at 20 Euro plus packaging (1,45 Euro) and shipping (Germany: 4,10 Euro, rest of the Europe: 13,90 Euro).

The book can be ordered by email: helmutundgiseladollhopf@t-online.de
Participants to the TIMS Mid-Term Tour to Greece can save on the shipping costs, when they send in their order latest on the 22nd of September to wdrv@gmx.de. The book will then be handed over in Greece.

Data:

·Windmühlen (Windmills), by Helmut Dollhopf

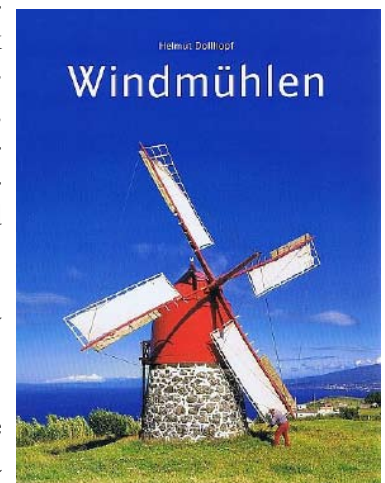
·164 pages, 158 colour pictures, 24,4 x 32 cm

·ISBN 978-3-940594-28-0

·Published November 2011 by Verlag W. Tümmels, Nürnberg, Germany

·Original Price: 48 Euro è Discounted Price: 20 Euro

·Weight: 1250 Grams



A MESSAGE FROM THE E-NEWS TEAM

Dear all, as you read this; we are putting the final touches to the midterm trip in Greece. We hope that we will have an interesting and enjoyable trip. For us it was a challenge with many unexpected things happening. Have also in mind, this last minute, we can still make arrangements for a couple of people to join us in a last minute decision!

As always we welcome your contributions to have an interesting issue. So please send us your information and articles, so we can always have an exciting one !

See you in Greece next month.

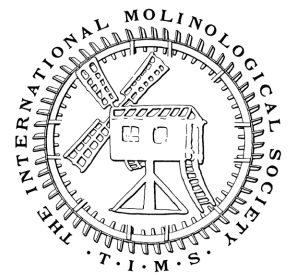
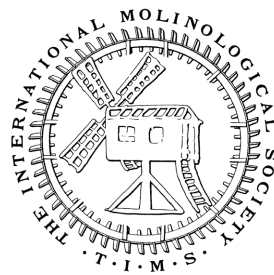
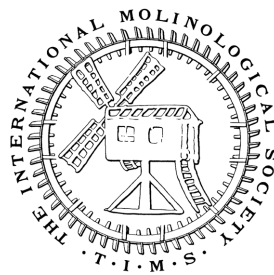
George Speis

gspeis11@otenet.gr

Katerina Toutouza

ktoutouza@hotmail.com

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