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AD CALYCADNVM

SAYI II -2012



OLBA KAZISI YAYINLARI



SELEVCIA AD CALYCADNUM II

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SELEUCIA AD CALYCADNUM II

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Demiriş 2006 Demiriş, B., *Roma Yazınında Tarih Yazıcılığı*, Ege Yay., İstanbul.
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Kaçar 2009 Kaçar, T., “Arius: Bir ‘Sapkın’ın Kısa Hikayesi”, *Lucerna Klasik Filoloji Yazıları*, İstanbul.
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PRAEFATIO

Mersin Olba Kazıları'nın bilimsel dergisi olarak 2011 yılında yayınlanmaya başlanan Seleucia ad Calycadnum Dergisi'nin ikinci sayısını okurlarımıza sunmaktayız. Erken Hıristiyanlık teması ile çıkan ilk sayımızdan sonra, ikinci sayıda daha geniş bir çerçeve içine yerleştirilebilecek bir içerikle dergimiz sizlerle buluşuyor. Olba arkeolojisi ve yerleşim tarihi konusundaki makalelerin yanında nümizmatik, arkeometri, Anadolu'da kent tasarımına ilişkin çalışmalar da dergimiz kapsamında yer almakta. Bu sayının çıkmasını sağlayan tüm yazarlarımıza, katkılarından dolayı yayın kurulumuz üyelerine teşekkürlerimizi sunarız. Arkeoloji, eskiçağ dilleri ve kültürleri, sanat tarihi konularında yapacağınız çalışmaların Seleucia ad Calycadnum dergisinin gelecek sayılarında yer almasından mutluluk duyacağımızı belirtiriz.

Editörler:

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Murat Özyıldırım (ma)

PRAEFATIO

We are proud to present the second volume of the annual journal of Mersin Olba excavations, Seleucia ad Calycadnum. After the first issue focusing on Early Christianity, a wider content of articles such as archaeometry, numismatic, urban design in Asia Minor will be presented in the second volume as well as the studies on the settlement history and archaeology of Olba. We wish to thank all our contributors, colleagues in the scientific board. It will be an honour for us to welcome our colleagues studying on archaeology, ancient languages and cultures and the history of art for the future issues of “Seleucia ad Calycadnum”.

Editors:

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ARCHAOMETRICAL PERSPECTIVES IN TURKEY

Ali Akın AKYOL*

Abstract

Archaeological and museological backgrounds of Turkey goes to the date of Late Ottoman Period in 1880's but the systematic archaeometrical activities were first seen in 1980's. Since then, number of groups in different universities of Turkey started to analysed the limited archaeological material for both identification and mostly conservational purposes. In the last two or three decades, departments of archaeometry in different universities were started to education, equipped university laboratories have organised and worked with archaeological artifacts increasingly. Many scientists are graduated from related fields and they have producing archaeometrical data on documentation of cultural heritage.

Key Words: Archaeometry, History of Archaeometry, Archaeometry in Turkey, Archaeometry Groups in Turkey.

Özet

Türkiye'nin arkeoloji ve müzecilik alanındaki geçmişi Osmanlıların son dönemleri olan 1880'lere kadar uzanır, fakat sistematik arkeometrik çalışmalar ilk defa 1980'lerde görülmektedir. Türkiye'de bu tarihten sonra farklı üniversitelerdeki çeşitli gruplar sınırlı sayıda arkeolojik malzemeler üzerinde hem tanımlama yapmak hem de konuma amacıyla inceleme çalışmalarına başlamışlardır. Son iki ya da üç on yıl içerisinde, farklı üniversitelerde arkeometri bölümleri eğitime başlamış, donanımlı üniversite laboratuvarları organize olmuş ve arkeolojik malzemeler üzerinde artan oranda çalışmaya başlamışlardır. İlgili alanlarda çok sayıda bilim adamı mezun olmuş ve kültürel mirasın belgelenmesi üzerine arkeometrik veriler üretmişlerdir.

Anahtar Kelimeler: Arkeometri, Arkeometrinin Tarihçesi, Türkiye'de Arkeometri, Türkiye'de Arkeometri.

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1. INTRODUCTION

Archaeology is partly the discovery of the treasures of the past, partly the precise work of the scientific analysis, and partly the exercise of creative imagination. Archaeology is both a physical activity out in the field and an intellectual pursuit in the study or laboratory.

For the generalization in all scientific researches, whether observational or experimental, it is apparent that a continuum is involved that has the laboratory sciences at one end, and the social sciences at the other. Archaeology is located at the center of the line which means it is both related with experimental and observational sciences¹.

The beginning of archaeological studies dates back to very old times. However, the use and applications of disciplines such as physics, chemistry, geology, biology, material sciences, mathematics, statistics and computer science in the evaluation of archaeological findings increased more and more during the last 50 years or more. These studies have contributed to the development of an interdisciplinary cooperation and brought about a new concept called "Archaeometry".

Archaeometry is certainly older than its name. The term "Archaeometry" was first used in 1958 when a journal in Oxford University was published with this name. In fact, the application of physical methods goes back to the nineteenth century, and chemistry was employed even earlier still. Chemical analysis started around 1800 on glass, pigments and metal alloys used for weapons and coins. The famous English chemist Davy, for example, investigated in 1815 a pot with rests of colors originally belonging to a painter in Rome of the Emperors. This study is assumed to be the first important archaeometric study.

The need for such quantitative treatment of archaeological artifacts is obvious if one imagines the questions asked by those archaeologists who have to appraise the material remnants of the past. What is it? How old is it? And in the case of artifacts how has it been made? Was it made locally or from where did it come to the site and by which trade routes? And, how is it affected by geographical and ecological changes? These studies in archaeometry provide the universal chronology, information on where artifacts were made, on how they were made and on what were used for, information on past landscapes, climates, tectonic processes, flora, and fauna as well as on man himself, information about the location both of archaeological sites themselves and of buried features within these sites, information for full site evaluation prior to

1 Blalock 1979.

any planning application, information for decay processes and development of new methods of conservation.

Archaeometry is also connected to earth sciences. Geological and geotechnical considerations make part of special cases brought during excavations in archaeological sites. Moreover, observations made these sites and / or ruins of structural components let unearthed to imagine parts of the area related to seismic earth deformations and structural distorsious signs of some unknown earthquakes of the past are ever depicted via these observations.

2. ARCHAEOLOGICAL AND ARCHAOMETRICAL BACKGORUNDS OF TURKEY

What we have from Past to Present in Turkey: Institutions and Figures on Archaeology

It is possible descend the beginning date of museology in Turkey to Seljuks Period. The Seljuks surrounded the Konya Huyuk with a city wall and decorated it with various engraved Stones from different periods; in other words they applied concepts of museology. Léon de Laborde (1807-1869) gave some engravings of the Konya city wall and gates which were decorated with reliefs in his book “Voyages en Asie Mineure et Syrie” which was published in 1837. However the city wall of Konya is not a unique example. There are many other artitectural monuments made by the Turks whose façades in an attention drawing way. By this way, these pieces were not only displayed but also prevented to be annihilated² [2].

During the reign of Sultan Abdulmecid (1839-1861), Fethi Ahmed Pasha (1801-1858) who was the Pahsa of Imperial Arsenal of Ardonance and Artillery, pioneered for the establishment of two small museums in 1848; one for the old weapons and another for the antiquities was laid in the two halls of the Atrium in the Hagia Eirene Church. These museums were the first archaeological museums in Turkey. Foreign authors such as Maxime du Camp (1850), Gustave Flaubert (late 1850) and Th. Gautier (1852) visited this museum and mentioned in their books. The catalogue of this small museum was published in the 1868 volume of *Révue Arcéologique* by A. Dumont.

In the real sense, Turkish museology and archaeology were started by Osman Hamdi Bey (1842-1910). In 1881, the first law of historical monuments was proposed by Osman Hamdi Bey who was the first Turkish museologist and one of the most famous painter.

2 Eyice 1990, 9-10.

In the Turkish Republic's Period, Department of Antiquities within the Ministry of National Education was founded in 1920. An official circular was sent to all province entitled "Instructions Concerning Museums and Antiquities". This circular was of vital importance for the future of Turkish Museology and Turkish Archaeology. In 1923, a scientific research committee was founded by Ataturk who is the founder of Turkish Republic. This committee drew up a program for the establishment of national museum and an associated ethnographic museum and redrafted the antiquities law. During this time, the government announced a program which broadened the brief the enumeration of standing monuments, the collection and examination of ancient items and the establishment of museums in appropriate centers³.

The 1930's were the years in which Ataturk was most concerned with the subjects of culture, history and language. Students were sent to Europe to study archaeology. In 1936, The Language and History - Geography Faculty was opened. The new Department of Antiquities and Museums was established under the supervision of the Ministry of National Education.

The Turkish Historical Research Association, later The Turkish Historical Society was founded in April 1930 aiming study the history of Turkey and the Turks and to publish the results of these studies. The first Historical Congress was held in Ankara in 1932⁴.

The first Turkish excavation was began at Ahlatlibel in Ankara under the patronage of Ataturk. Turkish archaeologist took courage from the success of this project and in 1935, their first large scale excavation was began at Bronze Aged Alacahoyuk. The archaeological artifacts unearthed from the excavation was carried to Ankara gathered in Hittite Museum which is 15th Century Mahmut Pahsa Bedestan and Kurusunlu Caravanserai. The name of the museum was changed into Anatolian Civilization Museum in 1969.

Ministry of Culture and Tourism was founded and all departments were separated from the Ministry of National Education in 1974. Two departments, General Directorate of Cultural Heritages and Museums and General Directorate of Waqfs, under the ministerial structure is generally responsible for not maintenance alone also restoration and conservation of the historical monuments in Turkey [5].

About 77500 archaeological points, 8573 archaeological and 1234 natural sites has registered officially in Turkey. In 2009, 146 excavations were performed by national and international teams (48 directed by foreign teams; 13

3 Önder 1990, 20-22.

4 Turkish Historical Society, <http://www.ttk.gov.tr/>.

German, 8 American, 7 Italian, 6 British, 2 Austrian, 2 French, 2 Belgian, 1 Swedish, 1 Japanese, 1 Canadian and 1 Dutch teams) and 30 excavations directed by museums. In addition, 108 archaeological surveys (76 directed by national teams), 127 salvage excavations (including highway and dam projects) were carried out by museums and archaeological teams. The finds and related archaeological and ethnographical items are preserved in 98 state and 127 private museums in Turkey [5].

Turkey has signed the World Heritage Convention in 1983 lastly after another international conservation contract and through the work carried out under the responsibility of the General Directorate for Cultural Heritage and Museums, 9 properties were inscribed on the World heritage List. Among these properties, historical areas of Istanbul, city of Safranbolu, Hattusha (Bogazkoy) Hittite capital, Nemrut Mountain, Xanthos and Lethoon archaeological sites, Great Mosque and Hospital of Divrigi and archeological site of Troy are listed as cultural, while Pamukkale-Hierapolis and Göreme National Park-Rock Sites of Cappadocia are listed both as cultural and natural heritage⁵.

Archaeometrical Background: Universities and Archaeometry Groups in Turkey

For the archaeological material studies, knowing the archaeological or anthropological science as a term, archaeometry was mostly accepted in Turkey. Archaeometrical studies were not started at the same time with Europe but multidisciplinary character of the archaeometry were accepted easily not only for necessity but also the technical improvements and educated skeleton of the Turkish archaeology was also ready to act.

The archaeometrical interest, which was already existing independently in the departments of basic sciences (physics, chemistry etc.) and archaeology at the different universities, flourished with the Keban Dam Rescue Project (1968-1974). The Keban and Lower Euphrates Projects began in 1975 and one of the biggest rescue projects in the world at that time were realised by salvage excavations. These acts, as an archaeological field laboratory, enable the well educated new generations of the republic to learn the practise of field archaeology. So It opened new perspectives for the archaeologist and Turkish archaeology has found the opportunity to use modern archaeological tools and worked with foreign archaeologist cooperatively.

In the 1970's, the governmental departments (Ministry of Culture) or institutions in the universities on the conservation of cultural heritage were were

5 Turkish Republic, Ministry of Culture and Tourism, www.kultur.gov.tr/

grew up. One of the first institution, Center for the Investigation and Salvage of Historical Remains, TEKDAM (later TAÇDAM) at Middle East Technical University (METU) which had a very efficient role of coordination of big-scaled regional projects, The Keban and Lower Euphrates, were come out⁶.

The scientists who have carried out individual studies in Turkey since 1960's have been cooperating with archaeologists. In the 1970's, an application was filed to TUBITAK (The Scientific and Technological Research Council of Turkey) for the establishment of a Unit of Archaeometry attached to it and eventually the Unit of Archaeometry was established in 1980. The pioneer scientists are Halet Çambel, late Ufuk Esin, late Bahadır Alkım, late Handan Alkım (Istanbul University), Yeter Göksu (Çukurova University) and late Olcay Birgül (METU). Olcay Birgül was also the first chairperson of the Archaeometry Unit. Scientists from METU (Ay Melek Ozer, Sahinde Demirci, Sevim Buluç, Emine Caner, Gülay Dereli, Mustafa Ozbakan and Naif Turetken), Hacettepe (Mehmet Ergin), İstanbul Technical (Muzaffer Sanver), Çukurova (Zehra Yegingil and Seref Kunç), Bogaziçi and Fırat Universities and archaeologist and bureaucrats from museums (Raci Temizer from Anatolian Civilization Museum, Ergun Kaptan from General Directorate of Mineral Research and Exploration and Volkan Ediger (Turkish Petroleum Association) have participated in this Unit. Unit had continued to do researches under the name of AKSAY which stands for the "Investigation of Archaeological Findings by Spectroscopic and Analytical Methods" in Turkish. This Unit functioned until 1992⁷.

Alongside the work of the Unit, there was a need to educate students who would carry out archaeometric studies in the museums and at other research laboratories. As a result of this, METU initiated a M.Sc. Program in Archaeometry as part of the Graduate School of Natural and Applied Sciences in 1990 with thesis and non-thesis version in 2003 and Ph.D. in 2004. Then, another M.Sc. program at Çukurova University was followed. The main purpose of the programa are to qualify the graduates toward bringing solutions to the archaeological problems by the application of scientific methods of natural and applied sciences. The study and understanding of history have acquired a new dimension through the collaboration between pure scientists and archaeologists. Thus, the analysis, identification and dating of archaeological remains and materials have become complete. The programs educate bachelor's degree holders in all fields. More than 30 archaeometrist have graduated since 1994.

6 Center for Research and Assessment of the Historic Environment (TAÇDAM) at METU, <http://www.tacdham.metu.edu.tr/>

7 Özer – Demirci - Türkmenoğlu 2008, 4.

The archaeometry was the main sub section of International Symposium of Excavation Survey and Archaeometry in 1985 held annually by Ministry of Culture and Tourism and 31th was in 2009. In addition the 29th International Symposium on Archaeometry (9-14 May, 1994) was also held by the METU Department of Archaeometry in Ankara. Same group was also organised the first thematic workshop on archaeometry of ceramics in 2009, the next on glass will be in 2011.

So many international research institutes having valuable documents on archaeology and libraries that are American, British, German, Netherland, French and Italian etc. have studying on Anatolian archaeology and getting study on archaeometry for a long time.

On the other hand, in 2006, the protocol was signed for the purpose of using high technology for the examination on cultural heritages between Turkish National Agency of Nuclear Energy and Ministry of Culture and Tourism. In the first step, the metropol museum collections will be scanned by portable devices.

3. RESULTS

Archaeological and museological backgrounds of Turkey goes to the date of Late Ottoman Period in 1880's. So many first on Anatolian archaeology come along that are the first systematic excavations (in Troy by Schliemann and Sidon by Osman Hamdi Bey) and the first laws on cultural heritages. After a long war period, the effective transition periods between from 1920 to 1940 passed and institutional and academic organisations to the conservation of cultural heritages formed at about same period with western country. Although archaeometrical studies in Europe started in 1950's with the new dating and analysing techniques, the first archaeometrical systematic studies with similar acceleration were unfortunately seen in 1980's in Turkey. Since then, number of groups in different universities of Turkey started to analyse the archaeological material for both identification and mostly conservational purposes. This experience of groupbase studying on archaeometry has changed in the last decades and there is an interventions that large scaled university laboratories reorganised and are interested in archaeological artefact studies increasingly. Many basic and environmental scientists are graduated from related fields and they are producing archaeometrical data. The national and international multidisciplinary scientific and research projects are going on the subjects of documentation, cultural heritage assessment and conservational purposes. These are supported by national and international resources and thus, the studies has

published periodically never seen as before.

Bibliography:

- Blalock 1979 H. M. Blalock, "Social Statistics", Mc Graw-Hill, 2nd Ed., New York, 1979.
- Eyice 1990 S. Eyice, "The Beginning of Museology in Turkey and Museums for the Islamic Turkish Finds", *Muze-Museum*, no. 2-3, pp. 9-10, July 1989-June 1990.
- Önder 1990 M. Önder, "Ataturk and Museums", *Muze-Museum*, no. 2-3, pp. 20-22, July 1989-June 1990.
- Özer-Demirci-Türkmenoğlu 2008 A.M. Özer, Ş. Demirci and A.G. Türkmenoğlu, Booklet of Middle East Technical University Graduate School of Natural and Applied Sciences Graduate Program of Archaeometry, p. 4, 2008.