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A REPORT FOR
THE GENERAL DIRECTORATE OF CULTURAL HERITAGE AND MUSEUMS

(EDINBURGH WREATH)

INTRODUCTION:

1) Based on available data and archaeological analogy method, a report has been prepared by me previously (November 2010, see Appendix 2) about the Anatolian origin of the Edinburgh Wreath which had been seized in Edinburgh-Scotland in 2010. The wreath, which was sent to our country to be examined upon the request by the Office of Milas Public Prosecutor, remained in Turkey between March 15th and 20th, 2013; and has been inspected thoroughly using chemical and analogy methods by the expert committees from the Museum of Anatolian Civilizations in Ankara under the Ministry of Culture and Tourism of the Republic of Turkey and the Turkish Atomic Energy Authority[1].

2) In my report, prepared in November 2010 the Edinburgh Wreath has been compared to other wreaths with similar dates and characteristics included in the collections of the museums of Anatolian Thrace, the North West and the South West Anatolia (İzmir, Milas, Bodrum, Çanakkale, Tekirdağ, Kırklareli, and İstanbul). This comparison has been made by means of analogical inspection and consequently the opinion that the wreath originated in Anatolia and is likely to have been unearthed from a sarcophagus or a tomb in terms of manufacturing technology, has been strengthened. Moreover, as a result of the evaluation of these findings in terms of cultural history of Anatolia within the historical context, it has been concluded that the wreath belonged to an administrator in a high position from the Persian Satrapies who achieved dominance in the Carian Region in the 4th Century BC. Based on this information, a solid opinion has been reached that the artifact might be a burial gift stolen from the Milas Hecatomnos Tomb plundered by illegal excavations.

3) As a result of the above-mentioned report; the fact that the Edinburgh Wreath is consistent with wreaths dated to the years between BC 360-340 in consequence of the close similarities of the wreath in terms of its general structural features and style with the other golden wreaths dated 4th century BC. it has been set out that the wreath is dated 4th century BC based on the main body of the wreath in the form of tube, the quantity of leaves thereof, and the technique used to attach these leaves to the main body as well as its general naturalist style.

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The expert committee from the Museum of Anatolian Civilizations in Ankara inspected the wreath on March 15th, 2013 and submitted a report dated March 28th, 2013 in line with the report prepared by the expert committee from the Turkish Atomic Energy Authority dated March 19, 2013.
The expert committee from the Turkish Atomic Energy Authority inspected the wreath on March 15th, 2013 submitted a report dated March 19th, 2013. (see Appendix 3)

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CONSIDERATION:

4) This report contains the archaeological assessment of the wreath which was in Turkey between March 15th and 20th, 2013 and is based on the information obtained from the inspections of the expert committee from the Museum of Anatolian Civilizations in Ankara, composed of an archaeologist, an archaeometrist, and a chemical engineer and the expert committee from the Turkish Atomic Energy Authority which was held on the Sarayköy Facilities of the Authority.

Brief Technical Information about the Edinburgh Wreath

5) The Edinburgh Wreath weighs about 142.99 grams and is 25 cm in diameter. The main body of the wreath in the form of a branch is formed of thin golden tubes of circular sections. The tubes are brought on each other on the front and rear part of the wreath and are attached to each other by wrapping golden wires at two points at the back. Some leaves and myrtle flowers 6 - 6.5 cm long and 1.2 cm wide in average are attached on the tube body. The leaves are obtained by swaging golden plates and working up into membranes / foils. Moreover, there are longitudinal nervures in the middle of each leave in the form of a line worked out by swaging. The number of leaves is about 50 and they are placed on both sides with the ends facing one another.

ANALYSIS:

6) The similar wreath examples referenced in the report dated November 2010 have been associated empirically with the analyses and findings of the experts of the Museum of Anatolian Civilizations.

7) The archeological context has been established in the report dated March 28th, 2013 prepared by the Museum of Anatolian Civilizations in Ankara (see Appendix 4) as a result of the inspections conducted when the Edinburgh Wreath was sent to Turkey by comparing the wreath with the similar golden wreaths found in Anatolia in excavations conducted by employing systematical, scientific, and archeological methods.

8) The analogies / comparisons on the Edinburgh Wreath with the wreath examples currently prepared by the experts of the Museum of Anatolian Civilizations and stored in the museums in İzmir, Milas, Bodrum, Çanakkale, Tekirdağ, Kırklareli, and İstanbul provide explicit information about the Anatolian origin of the Edinburgh Wreath.

9) The consistent results achieved in archeological analogy have also been verified chemically by means of elemental analysis conducted by the method of Portable X-Ray Fluorescence Spectrometry Analysis and hierarchical cluster analysis.

10) The chemical data collected from the Hecatomnos Tomb in Milas plundered by illegal excavations has been examined along with the data obtained by the analysis on the Edinburgh Wreath conducted by the experts from the Turkish Atomic Energy Authority under the title of "Assessment of Environmental Factors" in the report of the Museum of Anatolian Civilizations dated March 28th, 2013. As a result of this report, it has been found out that the results of analysis

on the structures of the filling earth in the Hecatomnos Tomb in Milas and the soil residues detected in the tube part of the Edinburgh Wreath are exactly identical to each other. The congruence of soil analyses have proved that the Edinburgh Wreath was found by illegal excavations in Milas.

11) The analogies/comparisons with the golden wreath examples referenced on the report dated March 28th, 2013 housed in the museums of İzmir, Milas, Bodrum, Çanakkale, Tekirdağ, Kırklareli, and İstanbul are the same with the Edinburgh Wreath. A consistent result have been reached in the direction of Anatolian origin of the Edinburgh Wreath by comparing the myrtle leaves and flowers on the Edinburgh Wreath with wreaths in the Museums of Anatolian Civilizations with very close and similar characteristics in terms of technical, schematic, and stylistic aspects.

12) The long naturalist leave style of the Edinburgh Wreath is one of the elements proving the stylistic link between the Edinburgh Wreath and the Western Anatolia referenced examples. The thin and long leave forms, the embossed nervure line in the middle of the leaves, the leaves connecting to the main body by a thin stem, the offshoots in between the leaves, and the myrtle flower emerging with the offshoots on some wreaths preserved in Anatolian museums indicate the repetitive style coherence among many wreaths.

13) Not only the style but production techniques also support this uniformity. In the production of Edinburgh Wreath, the techniques such as soldering the gold metal with same characteristics and composition to connect the parts, printing and cutting styles of the leaves and rosettes pieces and combination style of the frame tube are the common practices seen in the art of metal working (Touretic) in Western Anatolia.

14) Given the historical comparison, the stylistic characteristics and production technology of Golden Wreath seized in Edinburgh is in conformity with the style of metal art in Western Anatolia the conclusion drawn is that the Wreath is one of the burial gifts of the Hecatomnos Tomb unearthed as a result of illegal excavations in Mugla-Milas.

15) This evaluation has also been verified in the results of the Portable X-Ray Fluorescence Spectrometry Analysis conducted by the experts from the Museum of Anatolian Civilizations and the analysis from the Turkish Atomic Energy Authority.

16) The conclusion about the origin of the wreath has been derived by examining data by means of microscopic, radiographic, and analytical surveys.

CONCLUSION:

17) According to the new technical reports and the scientific examinations and researches conducted by me, the Edinburgh Wreath is originated in western Anatolia and dates between the years BC 360-340.

18) The new and the old wreath examples not found in publications and preserved in museum stores have been examined in particular by the experts of the Museum of Anatolian Civilizations. The data and wreath examples provided in the current archeological and chemical reports prepared as a result of these examinations have contributed to the certainty of the opinion of the "*Western Anatolian origin of the Edinburgh Wreath*".

19) In the light of the results of chemical analyses by the experts from the Turkish Atomic Energy Authority indicating the exact identicalness of the structures of the filling earth in the Hecatomnos Tomb in Milas and the soil residues detected in the tube part of the Edinburgh Wreath as well as the analogies / comparisons and stylistic assessments by the experts from the Museum of Anatolian Civilizations on similar examples make certain that the aforesaid wreath is one of the artifacts within the tomb gifts of the tomb monument of the Hecatomnos Dynasty in Milas.

Associate Professor Ertekin M. DOKSANALTI

Head of Protohistoria Division
Selcuk University, Faculty of Arts
Archaeology Department

Date: February 13th, 2014.

Selçuk University
Faculty of Arts
Archaeology Department
Konya / TURKEY

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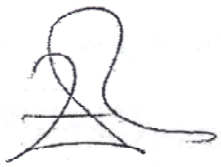
APPENDIX LIST

APPENDIX 1	Background of Associate Professor Ertekin M. DOKSANALTI
APPENDIX 2	The report dated November 25th 2010.
APPENDIX 3	The report the Turkish Atomic Energy Authority dated March 19th, 2013.
APPENDIX 4	The report of Museum of Anatolian Civilizations dated March 28th, 2013



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ACADEMIC BACKGROUND AND LIST OF WORKS

ACADEMIC BACKGROUND

Name Surname: ERTEKİN MUSTAFA DOKSANALTI

Date of Birth: 20.10.1970

EDUCATIONAL BACKGROUND:

Degree	Department	University	Years
Graduation	Archaeology / Classical Archaeology	Selçuk University	1993
Master	Archaeology / Classical Archaeology	Selçuk University	1997
Phd	Archaeology / Classical Archaeology	Selçuk University	2006
Ass.Prof./Prof.	Archaeology / Classical Archaeology	Selçuk University	2012

TITLE OF MASTER'S THESIS AND THESIS ADVISOR:

Two cisterns and finds unearthed in Kap-Krio excavations in Knidos.

Thesis Advisor : Prof. Dr. Christine Annette Margrit Özgan

TITLE OF PHD THESIS AND THESIS ADVISOR:

Knidos Kap-Krio Excavation Site

Thesis Advisor : Prof. Dr. Christine Annette Margrit Özgan

Job Experiences:

Position Title	Place of Work	Years
Research Associate	Faculty of Science and Letters, Selçuk University	1994- 2007
Research Associate-Phd	Faculty of Science and Letters, Selçuk University	2007- 2008
Assistant Professor	Faculty of Letters, Selçuk University	2008-

MANAGED MASTER'S THESIS:

Deniz Batu, Yaglibayat Artifacts exhibited in Konya Museum of Archaeology, S.U Institute of Social Sciences. Konya, 2008..

Bünyat Burak Aykanat, Face Depiction of serious style sculpture in the regions of Attika Ve Peloponnessos S.U Institute of Social Sciences. Konya, 2009.

Nilgün Armutçu, Wooden Archors in Shipping During Ancient Period, S.U Institute of Social Sciences. Konya, 2010.

Hünkar Keser, A group of Sculture of Roman Period housen in Efes Museum S.U Institute of Social Sciences. Konya, 2010

L.Ufuk Erdoğan, Sikkeler Işığında Liman Betimlemeleri, S.Ü. Sosyal Bil. Ens. Konya, 2010.

L.Ufuk Erdoğan, Harbour Depictions in consideration of coins, S.U Institute of Social Sciences. Konya, 2009.

POSITION IN THE PROJECTS:

Coordinator: Catalog of Small Finds, Konya Museum of Archaeology, Selçuk University BAP Project no 08401024: 2008- 2010.

Coordinator: Catalog of Small Find, Karaman Museum of Archaeology, Selçuk University BAP Proje no 10401007: 2010- 2013

Coordinator: Archaeological Underwater Researches and Surveys in Giresun Island and Giresun Coast, Selçuk University, Project no 10401068 2011- 2013

Assitant Coordinator: Excavation in Harbour Road in Knidos and research of road system in the city plan, TUBİTAK SBB- 2008

Assitant Coordinator : The two cisterns and finds in them found in Kap-Krio Excavations in Knidos, Selçuk University , BAP Project no 95/017 (SOBE): 1995- 1997.

Assistant Coordinator: Knidos Kap Krio. Teras Yapısı. Seramik Mimari Küçük Buluntu. Selçuk University , BAP Project no 2000/013 (SOBE): 2000- 2006.

Assitant Coordinator: Determination of recurrence interval of earthquakes and Slip velocity of Knidos' Fault with Cosmogenic Chlorine-36, a Surface Aging Method. The ongoing project of TUBITAK-113Y436.

ADMINISTRATIVE POSITIONS:

Co-head of Department of Archaeology, Faculty of Arts, Selçuk University 2008-2011

MEMBERSHIPS IN SCIENTIFIC ORGANIZATIONS:

1- General Association for Mediterranean Archaeology GAMA 2009

2- Rei Cretariae Romanae Favtorvm RCRF 2010

3- Member of the Association of Archaeologists (Board Member)

4- Member of the Association of Archaeologists, Konya, (Chairman of the Board)

Awards:

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The undergraduate and graduate level courses in last two years.

Academic Year	Semester	Course Name	Weekly Course Hours		Classroom Size
			Theoretical	Practice	
2009-2010	Fall	Introduction to Sculpture	2		60
		Sculpture in the Classical Era 1	2		60
		Roman Art 1	2		30
		Tomb Iconography in Ancient Era 1	3		5
		Late Antiqu, Byzantine Ceramic Art 1	3		5
		Roman Portraits Art 1	3		2
	Spring	Introduction to Sculpture	2		60
		Sculpture in the Classical Era 2	2		60
		Roman Art 2	2		30
		Tomb Iconography in Ancient Era 2	3		5
		Late Antique, Byzantine Ceramic Art 2	3		5
		Roman Portraits Art 2	3		2
2010-2011	Fall	Introduction to Sculpture	2		60
		Sculpture in the Classical Eral	2		60
		Roman Art 1	2		30
		Tomb Iconography in Ancient Era 2	3		5
		Late Antique, Byzantine Ceramic Art 1	3		5
		Roman Portraits Art 1	3		2
	İlkbahar	Introduction to Sculpture	2		60
		Sculpture in the Classical Era 1	2		60
		Roman Art 1	2		30
		Tomb Iconography in Ancient Era 2	3		5
		Late Antique, Byzantine Ceramic Art 1	3		5
		Roman Portraits Art 1	3		2

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WORKS

A. The Articles Published in International Refereed Journals

A1.Doksanaltı E.M, "A group of Lekythos with Black Figure from Karaman Museum" OLBA XIX, Mersin, 2011, 81- 105. (Art & Humanities Citation Index, EBSCO, PROQUEST ve TÜBİTAK-ULAKBİM Sosyal Bilimler Veritabanı)

A.2. Doksanaltı E.M. An Embossed Marble Block of Classical Era housed in Silifke Museum, OLBA XVI, Mersin, 2008, 207- 226.(TÜBİTAK-ULAKBİM Social Science Database).

B. Notices Presented at International Scientific Meetings and Published in the Proceedings.

B1. Doksanaltı E.M., "Die Keramikfunde aus den Arealen Z1 und Y1 der Dionysos- Stoa in Knidos", Congressvs Vicesimvs Rei Cretariae Romanae Favtorvm Ephesi et Pergami MCMXCVIII, Rei Cretariae Romanae Favtorvm Acta 36, Abignton, 2000, 75- 82.

B2. Doksanaltı E.M., Sağlan S., A Lekythos by the ‚Cock Group, from Karaman Museum, SERES 09, I. Int. Ceramic, Glass, Porcelain Enamel, Glaze and Pigment Congress, Eskişehir 2009, 122- 129.

B3. Doksanaltı E.M., "The Coarse Ware From A 'Late Roman House' in Knidos", III° International Conference On Late Roman Coarse Wares, Cooking Wares And Amphorae In The Mediterranean: Archaeology And Archaeometry. Comparison between Western and Eastern Mediterranean Parma/Pisa, 26-30 march 2008, Late Roman Coarse Ware 3, BAR International Series 2185- II, Oxford, 2010, 769- 780.

B4. Doksanaltı E.M., "Three Items of Hellenistic Glassware from the Karaman Museum", Proceedings of the XIII Symposium on Mediterranean Archaeology, Selcuk University of Konya, Turkey 23-24 April 2009, (eds. H.Öniz, E.Aslan) BAR International Series 2200, Oxford, 2011, 75- 79.

B5. Doksanaltı E.M., Mimiroğlu İ. M., "Giresun/Aretias- Khalkeritis Island", *ANODOS Studies of the Ancient World, 10/2010*, Trnava 2011, 85- 101.

7/1-10

C. International Books or Articles in Book Chapters:

C1. Doksanaltı E.M., Aslan E. (Editors), Proceeding of the International Sympsium Trade and Production Through the Ages, Konya 25- 28 Nov. 2008, Konya, Aybil Yay. S.Ü. Edebiyat Fakültesi, Dijital Baskı Merkezi, 2010.

C2. Doksanaltı E.M., Karauğuz G., The Hellenistic and Roman Ceramics from Field survey at Devrek and Its Environs, Proceeding of the International Sympsium Trade and Production Through the Ages, Konya 25- 28 Nov. 2008, (Ed. E.DOksanaltı, E. Aslan) Konya, 2010, 279- 98.

D. The Articles Published in International Refereed Journals:

D1. Doksanaltı E.M, Özgan R., "Thoughts on the two reliefs of Archaic Period from Cilicia" ANADOLU- ANATOLIA 32, 2007,1 – 20.

Doksanaltı E.M , Sağlan S., "A group of seals housed in Karaman Museum of Archaeology" , ANADOLU- ANATOLIA 34, 2008, 63-84.

D3 Doksanaltı, E.M. Aslan E., Mimiroğlu İ. M., Archaeological surveys in Giresun and Giresun Island, 2010, *Meeting of Survey Results 29.2*, Ankara 2012, 117- 147

D4 Doksanaltı, E.M. Aslan E., Mimiroğlu İ. M., Archaeological surveys in Giresun and Giresun Island, 2009 , *Meeting of Survey Results 28.2*, Ankara 2011, 143- 162

D5. Doksanaltı E.M., Mimiroğlu İ. M., Collection of Wooden Artifacts, Karaman Museum of Archaeology, Meeting of Survey Results 28.2 Ankara 2011, 435-455

D6. Doksanaltı E.M., Mimiroğlu İ.M., Güleç., "the preliminary report of Giresun Island Excavation: 2011", Anatolia and its environs in Medieval Age, issue: 5, 2012, 163-184

F. OTHER PUBLICATIONS:

F1. Doksanaltı E.M., "Knidos Kap Krio, Helenistic Cistern's Finds ", Les Ceramiques en Anatolie aux epoques Hellenistique et Romaine, Varia Anatolica XV, De Boccard 2003, 27- 33.

F2. Doksanaltı E.M., "Knidos Excavations and Researches– 2005", Turkish Ancient Science Institute-News January 2006, Issue 21, İstanbul 2006, 21- 22.

F3. Doksanaltı E.M., "'İnce Cidarlı' ceramic In consediration of finds of Knidos- Kap Krio Seramiği", İDOL, issue 31, 2006, 24- 31.

F4. Doksanaltı E.M., "Knidos- Kap Krio Settlement ", IDOL, Issue 33, 2007, 8-17.

F5. Doksanaltı E.M., " Cistern's finds and handled bowl found in Knidos- Kap Krio Excavations, IDOL, Issue 34, 2007, 28- 34.

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G.Director of a Land Project Supported by a Scientific Institution in the Fields of Archeology, Art History And Anthropology,

G1. Archaeological Survey in Giresun and Giresun Island: Permit No. 146087 dated July 09, 2010 of General Directorate for Cultural Heritage and Museums, Ministry of Culture and Tourism ,; Selçuk University BAP project number 10401068 BAP 2011.

G2. Catalog of Small Finds of Konya Museum of Archaeology: Permit No. 201101 dated November 30, 2007, of General Directorate for Cultural Heritage and Museums, Ministry of Culture and Tourism , Selçuk University BAP project no 08401024

G3. Catalog of Small Finds of Karaman Museum of Archaeology: Permit No.27151 dated February 11, 2009 of General Directorate for Cultural Heritage and Museums, Ministry of Culture and Tourism , Selçuk University BAP project no 10401007

H.Scientific Excavations and Researches

1- 1991- 2006: Knidos Excavations and Researches (Member of the Science Comittee)

2- 2010: Rhodiapolis Excavations and Researches (Member of the Science Comittee)

3- 2009- 2011: Archaeological Surveys in Giresun (Head of the Research)

4- 2010: Stratonikeia Excavation (Member of Science Comittee)

5- 2011- 2012: Giresun (Aretias/Khalkeritis) Island Excavations (Scientific Advisor of the Research).

6- 2012: Knidos Excavation (Scientific Advisor of the Research).

7- Knidos Excavation (Head of the Excavation)

SCHOLARSHIPS

A scholarhip for the purpose of "Staff Mobility for Teaching" within the scope of Erasmus program in Catania, Sicilia for a period of one week, 2010.

The scholarship of the Higher Education Council (YÖK) in Catania, Sicilia , 2012

INVITATIONS FOR INTERNATIONAL RESEARCH

The research invitation of Münster Westfälische Wilhelm University, Germany1998- 1999

The researh invitation of Londra British Museum, England 2001

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ADMINISTRATIVE POSITIONS

Head of the Department of Archaeology, Selçuk University, Department of Protohistoria and Asia Minor Archaeology 2009-

Co-Head of the Department of Archaeology ,Selçuk University 2008-2009

MEMBERSHIPS IN PROFESSIONAL AND SCIENTIFIC ORGANIZATIONS

Association of Research and Development of Knidos (Member of the Board) (1996- 2003)

Full Membership in Association of Archaeology and Archaeologists (Member of the Board 2010).

Chairman of the Board of the Association of Archaeologists, Konya (2007-

International The Trade and Production Through the Ages (from the Bronze Ages to the Late Antiquity) Symposium Bilimsel Kurul Üyeliği 2008 Konya

13th International Symposium on Mediterranean Archaeology Bilimsel Kurul Üyeliği

13th International Symposium on Mediterranean Archaeology Organizasyon Komitesi Üyeliği

14th International Symposium on Mediterranean Archaeology 23-25 April 2010 Kiev-Ukrayna Bilimsel Kurul Üyeliği

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TO GENERAL DIRECTORATE FOR CULTURAL HERITAGE AND MUSEUMS

Ref: 12.11.2010 Letter of General Directorate of Cultural Heritage and Museums.

A report has been requested on a golden wreath which was seized in Edinburgh by the referenced letter.

Please find the report attached. 25.11.2010

Kindly submitted for your information,

Assistant Professor Ertekin Doksanaltı

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Attachment: Report (10 pages)
Photographs (3)

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REPORT

THE GOLDEN CROWN SEIZED IN EDINBURG (WREATH)

Description:

The branch–shaped main part of the crown is formed with two thin gold circular tubes. Overlapping pipes at the rear and front part of the crown are united at two points by winding with gold wires. At the front, the tubes are united by winding each other. At the same time, the two tubes are fixed firmly to the main part by winding thin branch-shaped wires one another used as a decorative element at different points in front and at side.

"The Edinburgh Crown" (picture 1) is formed by placing the branch-shaped wires and the leaves about 5 cm. in length to cylindrical and hollow main body formed a kind of thin "tube". For this purpose, some ventages are pored on the main body/branch, and leaves stalks are embedded directly to these ventages by winding in a short and relatively thick. Leaves are obtained through making into lamina / foil by pounding goldplates, and the longwise stripe-shaped vessels formed by forging in the middle of each leaves give a realistic view. Because these foils have long, thin and pointed forms, it is understood that they are olive and myrtle leaves.As far as can be seen, more than twenty leaves are placed on the top of each other at the left and right sides of the crown. Leaves on each side, pointed-ends face each other. The impressive view provided with frequency and carefulness of leaves are corroborated with thin branches.Some of these thin branch-shaped wires are thicker. Held relatively thick curved branches wreath at the back, but also has a feature functional: the junction of the main body, fastened by wrapping these branches were reinforced. The relatively thick branches at back side of the crown has also a functional feature the joint of the main part is corroborated by winding the branches. Thus, these thin branches are used as rope/ bond and do not cause any interruption or division on the aesthetic appearance of the crown. Some of the branches are more spiral, there exist decorative elements formed as flower / rosette at the end of the thin branches The decoration is completed by being placed these thin spiral branches with flowers/rossetes not only to the undecorative parts of leaves but among the leaves. This rosette-flowers. a small plate, obtained by forging reliefs on flowering mold shape. I mean, are not designed in the form of flowers of different-independent leaves. The flowers/rosetes are in the form of relief made by forging a plate on a flowered mold. Namely, They are not designed in the form of flowers with independent leaves.

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Dating

Firstly, sometimes these types of jewelry are falsely referred as "diadem" or "Crown", however "golden wreath" will be appropriate for these types of jewelry[1].

There is a common idea that the gold wreath has been available since 5th Century BC[2]. However, the first known instance dates to 6th century B.C[3]. Gold wreaths began to become widespread in the early 4th century B.C, the Hellenistic period is the most popular time for them.

As mentioned, placing the leaves densely to the cylindrical main part, probably in the form of a hollow tube , is the tradition of late Classical period (4th century BC) and production technique of golden wreath[4]. The types of the wreaths especially have been seen since the mid- 4th century BC : tubular cylindrical body, densely leaves on top of each other , pores end parts of stalks on relatively thick and placed directly by bending cylindrically.
This tradition continues from 3th century BC until the late 2th Century BC. However, perhaps due to the economic crisis, understanding and fashions have become less frequent. Additionally, they are linked with the help of branch or thin branch wire. Once more, at the end of the period, probably due to the same reason, the main parts of the wreaths have been converted into bands by losing its cylindrical form with the art of forging. Thus, leaves have become appallingly obvious. Since late 3rd century BC, wreaths gets lighter [5].In particular, samples of the end of the century the number of leaves has decreased almost in half.

Golden wreaths are popular in 4th Century BC and during this period their general stylistic feature is their a realistic style[6] . The style of Late Classical period can be seen on the realistic leaves, flowers and quite natural branches of Edinburgh Wreath.

In terms of general structural features and style the Edinburgh Wreath show some similarities with golden wreaths[7]dated to the 4th century BC.

In the light with this information, the tube-shaped main part of Edinburgh Wreaths, the amount of leaf and to the linking technique of leaves to the main part, the general naturalistic style proves that this wreath dates definitely to the mid-4th century BC. Another aspect that supports this dating is similar examples.

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[1] In many catalogs in English and publicatons "Gold Wreath", noun phares, and the ones in German "Golden Kranz has been used.For instance, Pfrommer 1990, 8vd; Williams-Ogden 1994, 106-107.

[2] Kotsidu 1991, 85 vd: It is considered as a gift of honor given to the winner in Panathenaea festivals and music contests.

[3] The oldest gold wreath was unearthed in Sanctuary of Artemis Orthia.Dawkins 1929,383 no.7, 03, 14; Higgins 1982 102.

[4] Meriçboyu 2001,183.

[5] Higgins 1961,157. " the maximum effect with minimum golden leaf... the wreaths in any ways are related with burial and dead cult. Further reading see footnotes 4.

[6] Higgins 1982, 143; Pedde 1991 531.

[7] Despini 1996, 52-55; Andronicos 1981, lev.31; Landenius 1976, 46-49 Artomonow 1970, 74; 268-269

"Edinburgh Wreath" and Anatolian Samples

One of the samples produced similar style and technique with Edinburgh Wreath is the wreath of Tekirdag-Naip Tumulus (Pic.2)[8]. That wreath and Edinburgh Wreath are produced within the same framework of art. Both the linking technique of tubes and realistic style of leaves are confirmed. Moreover, Tekirdag Wreath and Edinburg Wreath resemble each other in respect to flower/rosette placing at the end of thin branches[9].

Because of both tubular main part, and decoration of leaves and their density the wreath unearthed in Tumulus II,Bergama show similarities with Edinburg in terms of technique and style[10].However dissimilarly, the leaves are in form of oak leaves and an Heracles knot with Eros is placed in the middle of two-line leaf sequences. Because of these structure, it dates to 3th century BC.Although Bergama Wreath dates to later period than Endinburg's, its the product of the same style and tradition.

In addition, a golden wreath being on display in the British Museum, thought to be Anatolian Dardanelles and perhaps associated with Dardanel[11] has same characteristics. However, that wreath also is made of oak leaves and has small acorns as a decorative element at the ends of bent branches. This sample dates to 300-350 BC because of both its decoration and figuration of main part. It is similar with our sample in terms of style and decoration. However, the difference between them is only its oak leaves, which can be explained with the personal preference or cultic features.

The leaves of golden wreaths are generally imitations of oak , laurel, myrtle and olive leaves. Very rarely, in the form of ivy leaf can be seen [12].

Some other Anatolian samples similar with the leaves of Edinburgh Wreath in terms of decoration method and style are available

The wreath stored in the Museum of Anatolian Civilizations shows close similarity with the sample in respect to decoration of leaf and style[13]. However, the main part is not decorated in the form of tube, but in the form of band. Therefore, it is supposed to be a sample of late 3th century or the early 2nd century and that indicates the olive leaf decoration is available for a long period of time. In the Roman Imperial Period, laurel and olive leaves, are the most favored ones. That shows the continuity in cultural style of leaves of golden wreaths in Anatolia.

Once more, in the production of another golden wreath on display in the Museum of Anatolian Civilizations, golden foils in the form olive leaf is used however, becauses of the reduction in the number of leaves and linking point to the main part, the wreath dates between 1th century BC and 1th century AC[14].

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[8] **Delemen 2004, 53,54, fig.44**

[9] **Delemen 2005, 55, fig. 46**

[10] **Pfrommer 1990, 8, 44, 53, 241, lev.6.1-3.**

[11] **Williams- Ogden 1994, 106-107, fig, 60.**
[12] **Despini 1996,47.**
[13] **Bingol 1999,53 No.14**
[14] **Mericboyu 2001,182, 1.**

7/1-17

Perhaps the most well-known samples of Anatolia wreaths is the one of Ada, Caria Princess, currently on display at the Underwater Museum of Archaeology, Bodrum. The wreath was found in 1998, made of gold (Figure 4). With the decoration of main the body as well as the leaves it shows close similarity with our samples. Moreover, the vertical nervure in the middle of the body and fixing method of leaves to main body, pointed ends, tubular main body and flower/rosette motives of bent branches used as binder at the rear part and those of at the end of thin branches show close similarities with the sample.The only clear characteristic is flower/rosette figuration at the center point in the front of the wreath.The leaves of the wreath probably consists of partly stylized myrtle leaves and tiny flowers/rosettes in between make it more sensible than the olive leaves.The wreath of Ada in terms of technique and style shows close similarity with Edinburgh Wreath, additionally, that associated with the origin of the Carian Coast is important.

Almost all of this type of wreaths were placed to tombs/ sarcophagus. This tradition is confirmed by the unearthed finds[15]. On the other hand, wreaths, crowns and diadems compared in terms of functionality, situation becomes sensible: it is supposed to be considered that in daily life or ceremonies women prefers full-round or half-round crowns, because a certain ease of use is clear. The wreath with too many leaves and bent branches are not convenient as much as diadems and crowns in the way of use.

Evaluation

1- Edinburgh Wreath in terms of form; with its main body made as cylindrical tube and relatively thick leaves placed directly to the main body, bent branches with thick/thin stalk in between leaves and decorative element at the end of those branches and density of leaves show close similarity with the samples of the mid-4th century BC.
As described above and in the footnotes, it is possible to see many same samples or similarly designated ones in museums around world. The vast majority of these examples related sources BC 4 century. Many of these samples dates to the mid-4th century BC and the second half of the 2th century BC in relevant literature.So dating for our sample is supposed to be between the first half of 4th century BC and third quarter of 4th century BC. Therefore, dating around 350 BC is appropriate for the Edinburgh Wreath.

2- Leaves form: with its thin and pointed ends, they resemble to olive or myrtle leaves. Again, as indicated in the footnotes, on the samples with olive leaf decoration, the decoration element used in bent branches is olive, while on our sample, instead of olive motif small rosette/flowers are used. From this perspective, it can be said that they are myrtle instead olive leaf but as a result theleaves of both plant have been used collaterally during the same period. Furthermore, the importance of olive is a well-known in the ancient world.That would not be wrong to say that the meaning attributed to the fruit and branches of the olive consecrates the plant. The situation is no different in terms of Anatolia in Ancient Period : olive was an important source of industry especially in the western regions of Anatolia, the ancient Caria and Ionia. As described above and in the footnotes , there are samples with olive leaf used as tomb gifts. However, preferring rosettes/flowers in our sample instead of small olives gives rise to thougt that the sample is formed with stylized myrtle leaves.

[15] Higgins 1961, 101-02; Pfrommer 1990, 8, 44, 53, 241; 6.1-3

7/1 - 18

3-Purpose of use and the tomb / sarcophagus as a place of discovery: the first appearance of this type of gold wreaths , the idea is that they are given as an gift of honor to the winner of music contest in panathenaea festivals. Later, they became the tomb gifts[16]. Almost all of the samples comparing and bearing resemblance with our sample and of those currently on display all around the world are tomb gifts.Also, in terms of functionality, this situation is conceivable, using a product having such complex leaves in daily life does not seem possible.

It has been clearly understood so far that these types of wreath are used as a tomb gifts. However, it does not seem reasonable for generally well-protected types are used in tombs directly in the ground, in any case, all those mentioned above and in the footnotes are unearthed from tombs or sarcophagi[17]. **Thus, "Edinburgh Wreath" is certainly unearthed from a sarcophagus or a tomb.**

4 - Possible In situ – Relation with Anatolia

4a- As Thrace Origin; Thrace is an important region with tomb / tumulus tradition. Both 1930s and in recent years, lots of tombs and gifts have been found in excavations in this area. Once considering other samples similar with the Thrace Wreath, associating the Edinburgh Wreath with the region is a possible major concern to keep in mind.

4b- As Caria Origin: Also, in terms of style and decoration, the similarities of the sample with the wreath of Ada mentioned above being on display in the Underwater Museum of Archaeology is quite obvious.

Furthermore, all of this information and the findings and a great illegal excavations shown up recently in Sanctuary of Zeus Carios in Milas, Muğla and wall decorations of the tomb that came to light in this event brings to mind that the origin of the artifacts is to be reviewed more carefully.

These decorations are polychrome and extremely careful ones. So, it is one of the finest samples of its kind. In the center, the frontal depiction of a man on his throne is decorated. The man looks at the veiled lady (probably his wife). The man depicted as bearded mature, and dressed, reaches out his arm to forward-up by twisting at the elbow and holds an scepter with his left hand. the upper side of scepter is leaned on his shoulder. Because of frontal decoration, the left arm is not very clear. As far as can be seen, the feet under the mantle fabric is on a thranion.

Probably, there is a cover of the mantle fabric on his head and the wreath motif can be seen on the cover. Just as the legs of throne he sat with scepter, the wreath is also decorated with gold foil. (Also can be seen, gold decoration are available on the skirts of his mantle and the area under the neck) When looking at carefully to the decoration of the wreath, it can be understood that the leaves are relative thin-long and with pointed end just like our sample.

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[16] Higgins 1961, 124

[17] the word "grave" is not used in any relevant literature, tomb that means burial chamber is preffered instead. In the excavation carried out in Caria region, at burials in the ground only leaves near skulls (Oren-Belentepe Excavations) or in osthotek or in urns(Knidos Excavations)were found rather than a whole wreath.

7/1-19

When considering the carefulness and the cost of the material used in decorations, the tomb is certainly built in the honor of a very important person for the region of Caria. Of course such a tomb for an ordinary person is not expected. However, for those who are rich enough and peers these kinds of tomb can be built. When taking into account in stylistic perspective the style of face and clothes crinkle of the figures, that indicates the Late Classic (4th century BC) period.

It is known that in this period **"Hekatomnos"** ruled the Caria region. Milas was the capital of Caria during the time of Hekatomnos, however; Halikarnasos became the capital in the period of Mausolus. It is known that all executive members of the dynasty made significant investments and conducted construction activities. Therefore, to tomb associate with a member of this dynasty is extremely sensible. In berief, the tomb owner could not be an ordinary citizen in any way, building the chamber just for a rich citizen is a remote possibility.It is supposed to be attributed to a very wealthy peer.

In the light of all the similarities mentioned above , it is possible to associate the Edinburgh Wreath with the Milas Tomb.

CONCLUSION

1) In the light of all those information, findings and the results of style-critic analysis, the Edinburgh Wreath dates to 350 BC.

2) It is extremely consistent to say that the wreath is used as gift in a tomb or sarcophagus of Anatolian origin –probably Carian Region

3) According to available data , when considering this Anatolian originated artifact in the scope of Cultural heritage protection legislation law, these kinds of artifact are public property according to both Asar-ı Atika Regulations being in force during Otoman Period in 1884 and the article 5 of the law on the protection of cultural and national heritage No. 2863. For this reason, in any way those artifacts cannot pass into private ownership. The artifact is supposed to be returned to its cultural geography in the shortest period of time.

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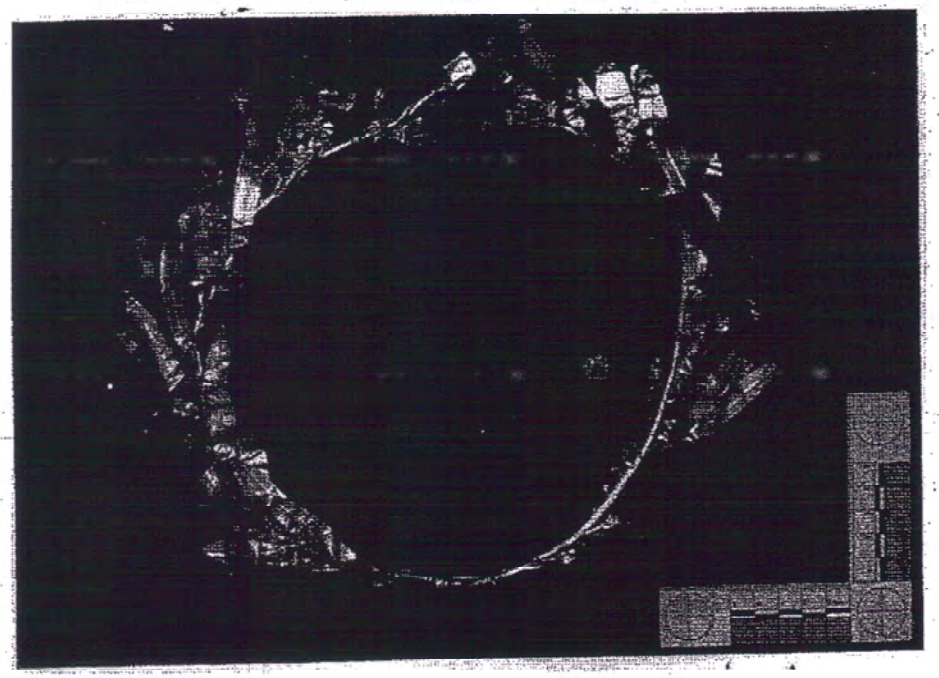
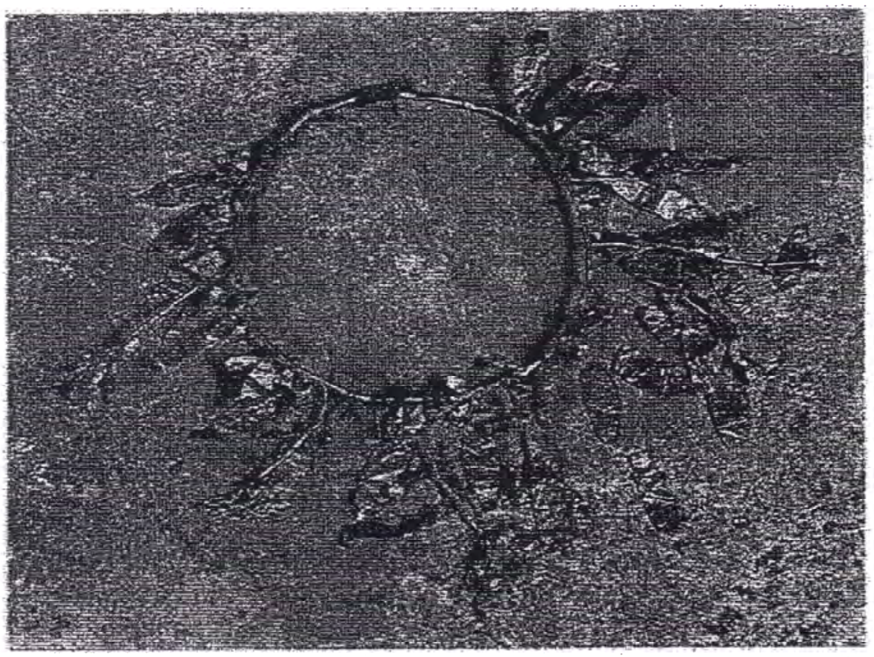
BIBLIOGRAPHY

Andronocos 1981	M.Andronicos, Museum Thessaloniki, Ein Führer durch seine Bestände, Athen.
Artomonow 1970	M.Artamonow, Golschatz der Skythen in der Eremitage, Prague.
Bingöl 1999	I.Bingöl, Anadolu Medeniyetleri Müzesi, Antik Takılar, Ankara.
Dawkins 1929	R.Dawkins, The Sanctuary of Artemis Rothia at Sparta., Supplementary Papper (Society for the Promotion of Hellenic Studies.
Despini 1996	A.Despini, Grek Art, Ancient Gold Jewellery, Athen.
Delemen 2004	İ.Delemen, Tekirdag Naip Tümülüsü, İstanbul.
Higgins 1961	R.Higgins, Grek and Roman Jewellery, Berkeley.
Higgins 1980	R.Higgins, Grek and Roman Jewellery, London. (2.ed.)
Higgins 1982	R.Higgins, "Macedonian Royal Jewellery",MacGreece 1982, 141-151.
Kotsidu 1991	H.Kotsidu, Die musichen Agone der Panathenäen in archaischer und classischer Zeit, Quellen und Forschungen zur Antiken Welt. Band 8.
Landenius 1976	E.Landenius, A gold Wreath in the Medelhausmuseet, MEdelhausmusect Bulletin 11.
Meriçboyu 2011	Y.A. Meriçboyu, Antikcag'da Anadolu Takıları, İstanbul.
Pedde 1991	F.Pedde, "Frehat en-Nufegi, Zwei seleukidenzeitliche Tumuli bei Uruk", BaM 22, 1191, 521-535.
Pfrommer 1990	M. Pfrommer, Untersuchungen zur Chronologie Früh-und Hochhellenistischen Goldschmucks, İstanbuler Forschungen, Band 37, Tübingen.
Williams-Ogden 1994	D.Williams-J.Ogden, Grek Gold, Jewellery of the Classical World. Italy.

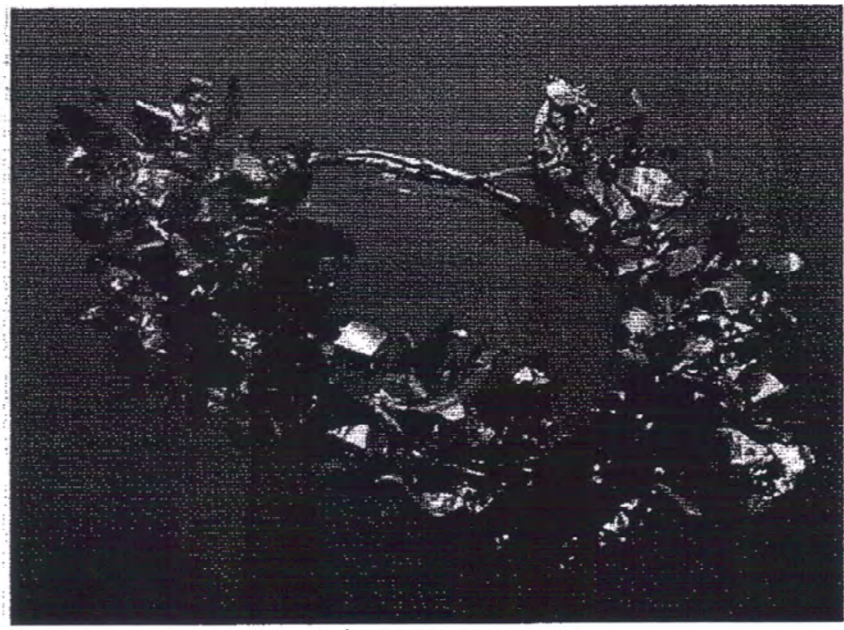


Picture 1 The Edinburgh Wreath

7/1-22



Picture 2 Tekirdag Naip Wreath



Picture 3 The Wreath of Ada, Halikarnasos Princess

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ANALYSIS REPORT

It is to acknowledge that the analysis on the Golden Crown sent to the institution with a letter of March 03, 2013 No.38931337/156.02-47769 were made with nondestructive nuclear methods in elemental analysis laboratory.

Quality management system exists in the institution, and in accordance with standart of the adequacy of ISO EN TS 17025 Testing and Calibration laboratories, its accreditation is available in Turkish Accrediting Agency, member of European Cooperation for Accreditation.

During the analysis, to measure the amount of elements in the Crown, the INNOX-X Portable X-Ray Fluorescence Sperometer is used and to analyze the miniscule particulars (70 micron in diameter) and to detect the differences on the surface , the BRUKER –Artax 800 X-Ray Fluorescence Sperometer (μ-XRF) is used.

Before starting on analysis, in order to check the accuracy of PXRF sperometer measurements, we used GOODFELLOW and IRMM BCR-691 standarts. Analysis results are following;

Standarts	Au(%)	Cu(%)	As(%)	Pb(%)	Sn(%)	Zn(%)	Sb(%)
GOODFELLOW Au SRM* values	99.95						
PXRF values	100						
IRMM BCR-691	-	78.8	0.194	7.90	7.16	6.02	-
PXRF values	-	77.9	0.23	8.18	6.89	5.96	0.67
Z_Score	0.005	0.12	1.95	0.35	0.35	1.0	-

SRM*= Standart Referance Material

This value must be lower than two (2)

When calculating the Z-Skor values utilized in comparison tests , it is seen that they are smaller than 2 (two). This proves that the results are reliable.

The results obtained from these ten measurements are below

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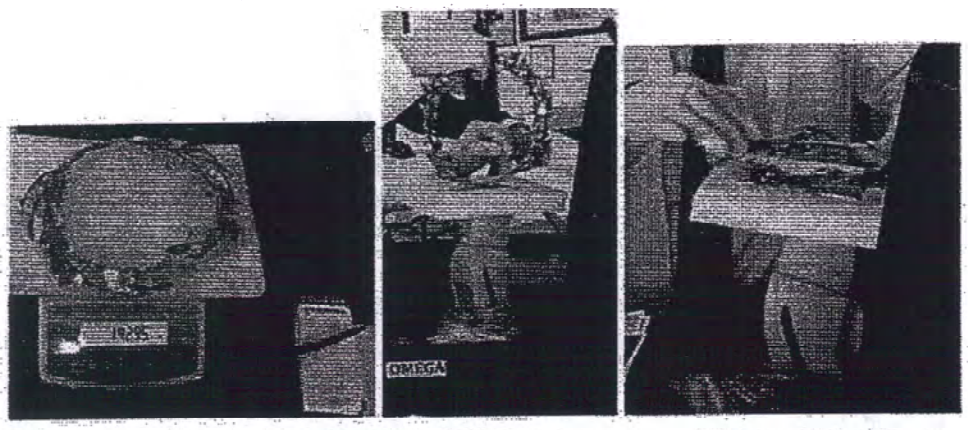

PXRF Analysis

-Based on the spectrometer PXRF analysis on many different points of the crown, it is clear that the artefact is mainly made up of Gold (Au), and small amount of Copper (Cu), Silver (Ag) Iron (Fe).

Dispersion percentage of these elements in the crown is below;

Element Parts of the Crown	Au (%)	Ag (%)	Cu (%)	Fe (%)
Pipe	99.5±0.5	-	0.40±0.10	0.08
Leaf	98.4±0.6	1.44±0.12	0.23±0.09	
Flower	98.7±0.5	1.27±0.11	0.03	0.06
Connection Wire	99.4±0.6	-	0.30±0.0.10	0.30±0.12

-With the thought of existence of sediment or residual on mouth of the pipe-shaped part forming the main body of the crown, point analysis were carried out with μ-XRF and the XRF spectrums of different points can be seen in Figure 1,2and 3. As a result of the Micro XRF analysis, some elements were detected different from the results of analysis of the crown.

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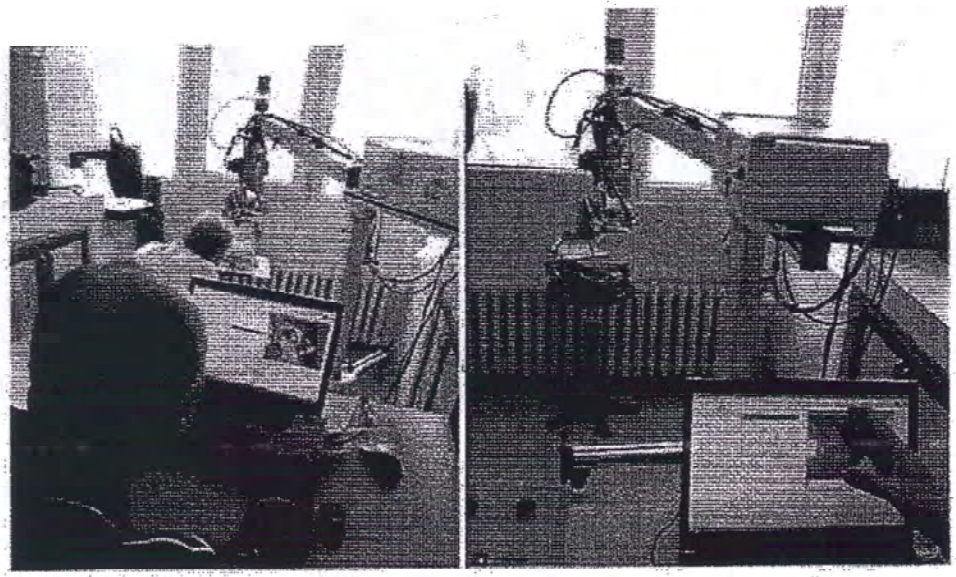

These are,

Calcium(Ca), Titantium (Ti), Manganase (Mn) Iron (Fe) and Lead (Pb) except for Gold (Au), Silver (Ag), Copper (Cu) which composes the crown.

Conclusion and Evaulation

The results of the Crown analyzed non-destructively with PXRF and XRF shows little differences on different parts and Gold's ratio is between the range of % 98- %99.5, the remaining consists of silver, copper and iron.

Except for crown forming elements, Calcium (Ca), Titanium (Ti), Manganese(Mn) and Lead (Pb) have been detected via μ-XRF point measurements carried out with the thought that there may be sediment or residual on the mouth part of the body.

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Physics Engineer

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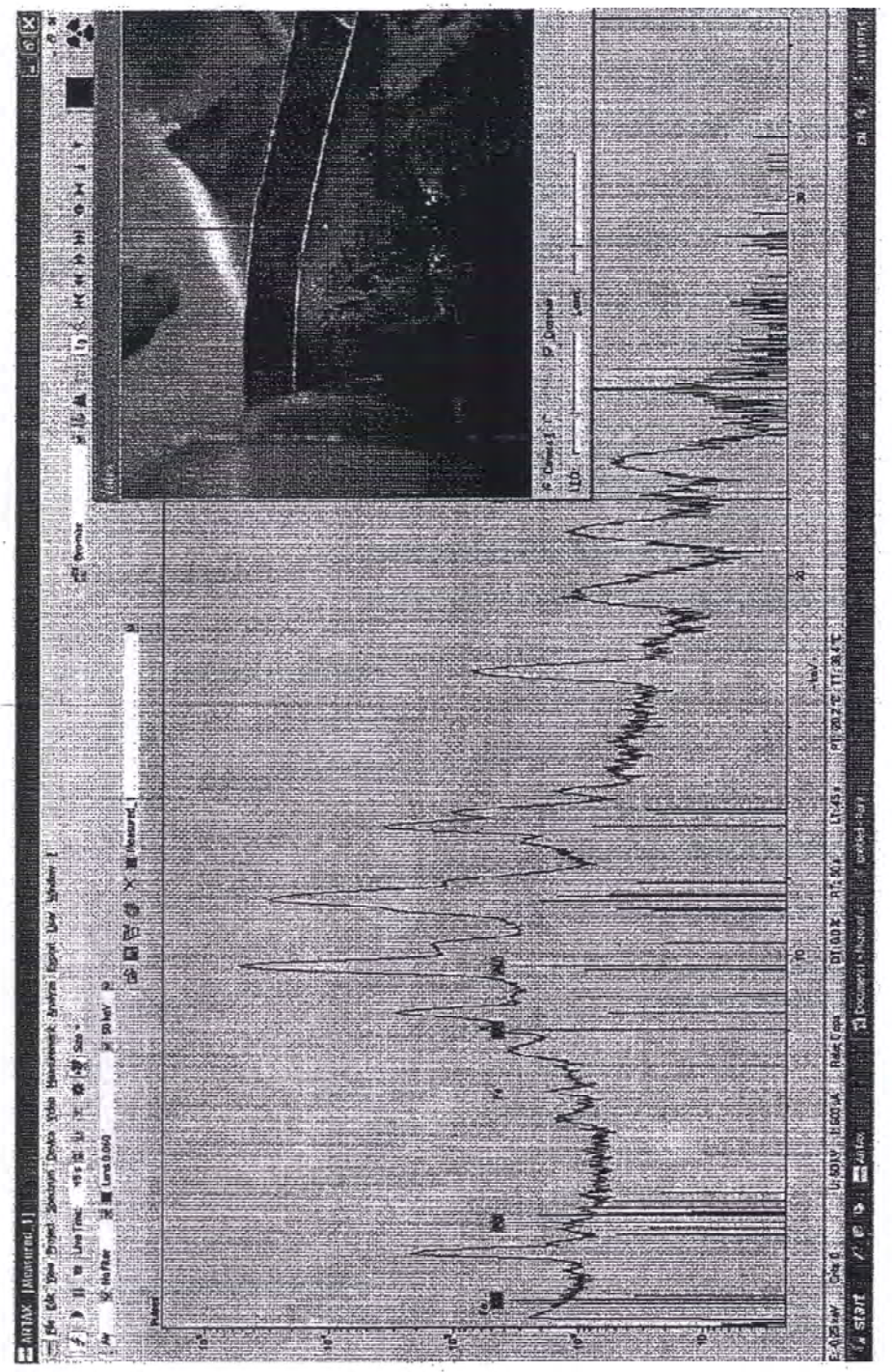
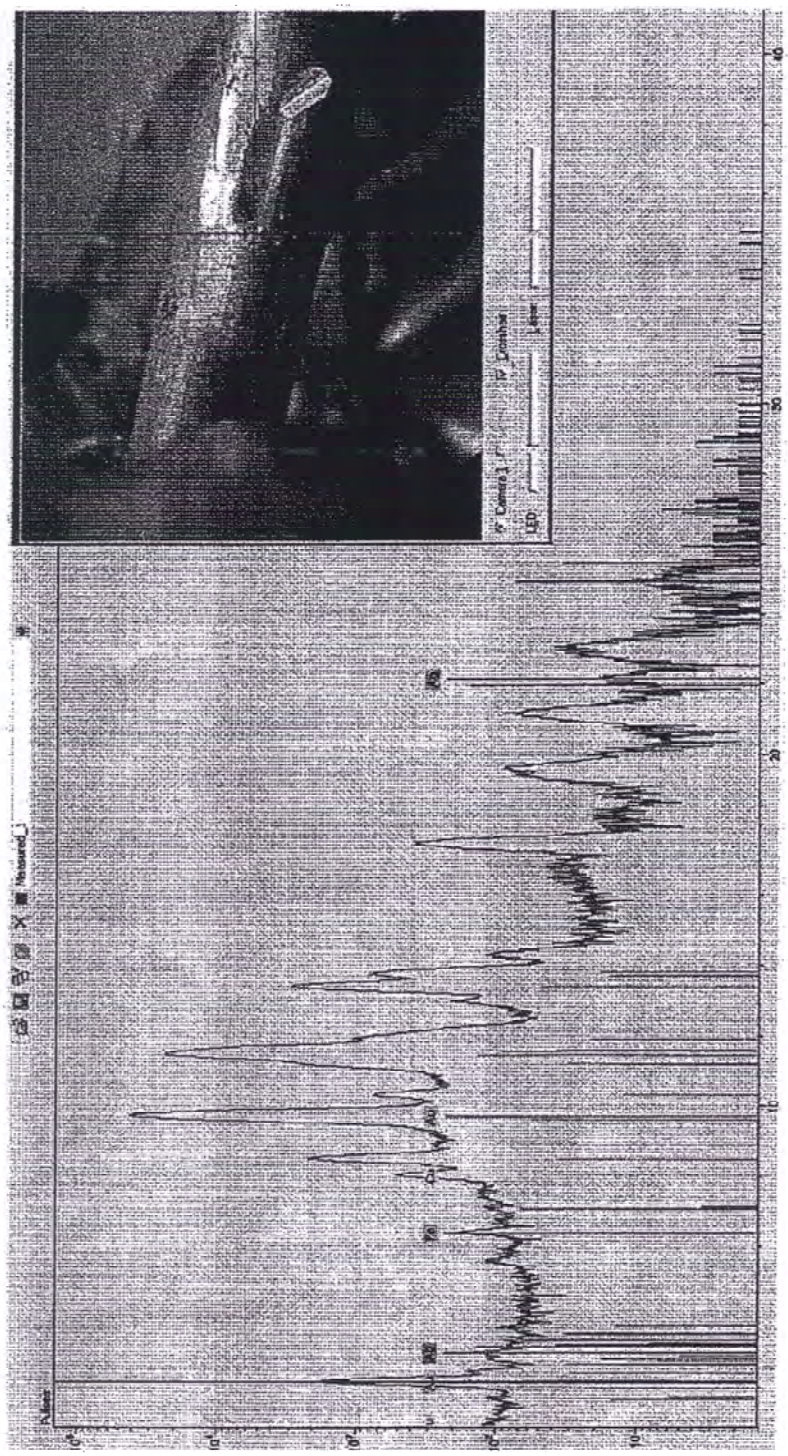


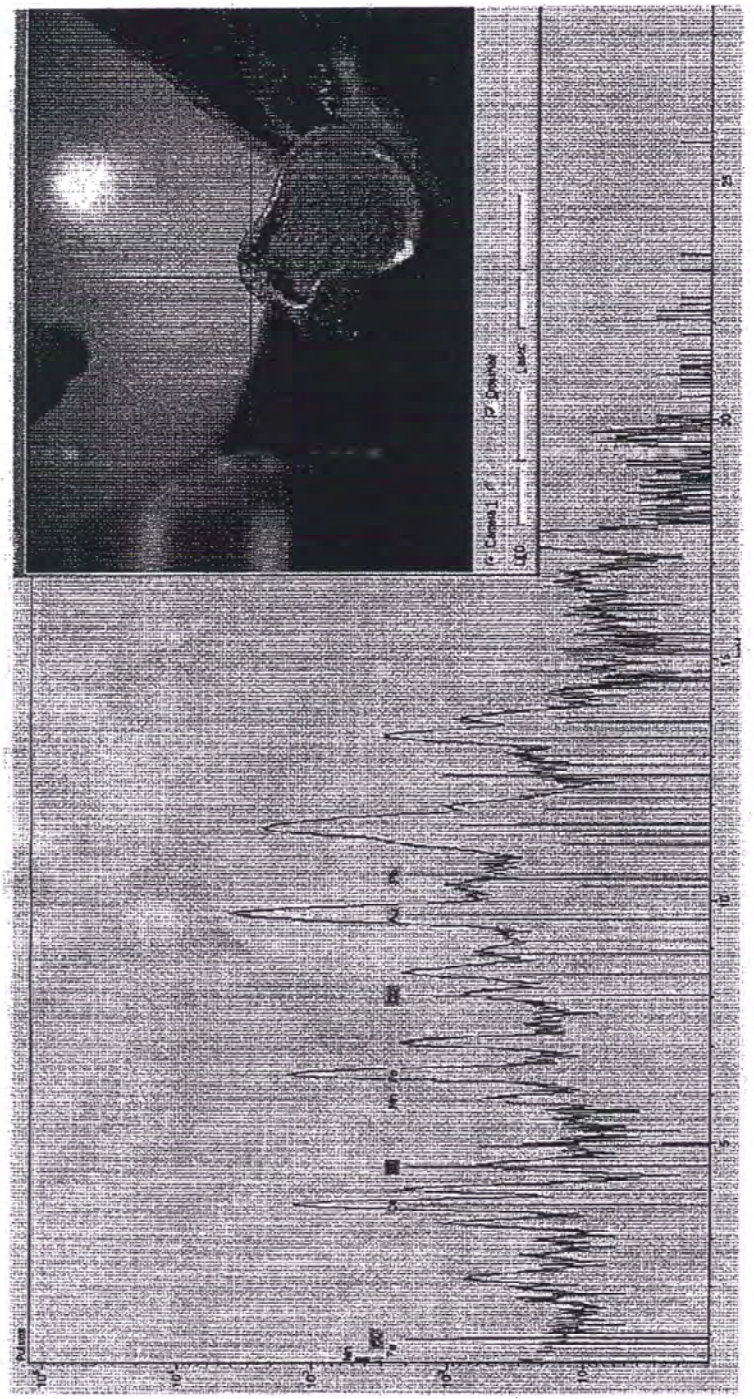
XRF Spectrum of Golden the Crown's Leaf
Fig 1

7/1-27



XRF Spectrum of the Golden Crown' s Pipe Shaped Part
Fig 2

7/1-28



XRF Spectrum of the Mouth of the Golden Crown's Pipe
Fig 3

7/1-29

GENERAL DIRECTORATE FOR CULTURAL HERITAGE AND MUSEUMS

Reference: March 08, 2013 letter of General Directorate for Cultural Heritage and Museums no. 38931337/156.02 – 47769

The golden crown, seized in Edinburgh, Scotland in 2010 and sent to our country for inspection through commission rogatoire request of the Public Prosecutor's Office of Milas, was examined by experts of Turkish Atomic Energy Authority in Saraykoy and us on March 19, 2013. During the inspection process of the artifact, archaeological data, production technology, the relationship of the crown with similar examples found in Anatolia were considered analogically and the conclusions in the analogical inspection of Golden Crown of Edinburgh set out in laboratory environment were verified with the microscopic, radiographic and analytical inspections.

ANALOGICAL INSPECTION

The crown of Edinburgh is approximately 142.99 grams and 25 cm in diameter. The crown is formed by making a gold plate cylinder pipe, plates are placed on the circle in the form of myrtle leaves and myrtle-shaped rosettes are soldered to the pipe with a wire of same gold material. (pic.1)

The leaves forming the crown are 6 - 6.5 cm long, 1.2 to 1, 3 cm in width and in the middle of the leaf a thick line is bedecked as a nervure. (pictures 2, 3). The number of myrtle leaves is about 50, it is seen that some of them felt from the body at a time in the past, and a leaf taken from the crown by cutting recently is understood clearly with the end-cut leaf stalk. The aforementioned artifact has been examined in detail before by Associate Prof. Dr. Ertekin Doksanalti in Seljuk University, according to the analogical evaluation, it is reported that the artifact probably belongs to 350 BC and is supposed to place a gift for dead to a tomb or burial chamber.

[1] X-Ray Inspection System; Radioscopy: A system designed to take X-ray images of the materials. Technical Specifications, X-ray Tube Voltage: 0-150 kV, X-Ray Tube Current: 0-3 mA, Focusing Distance: 0.3 X0, 3 mm.

[2] Analytical inspections by using p-XRF (Portable X-Ray Fluorescence Spectrometer) and μ-XRF (micro X-Ray Fluorescence Spectrometry) methods

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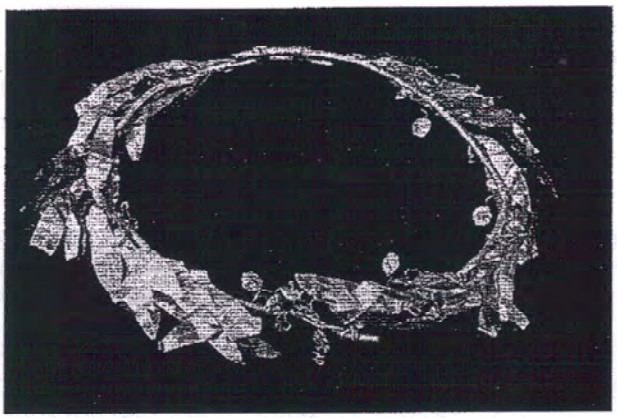
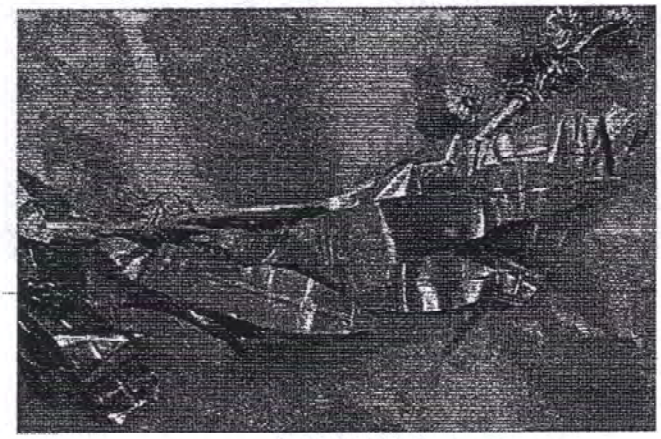
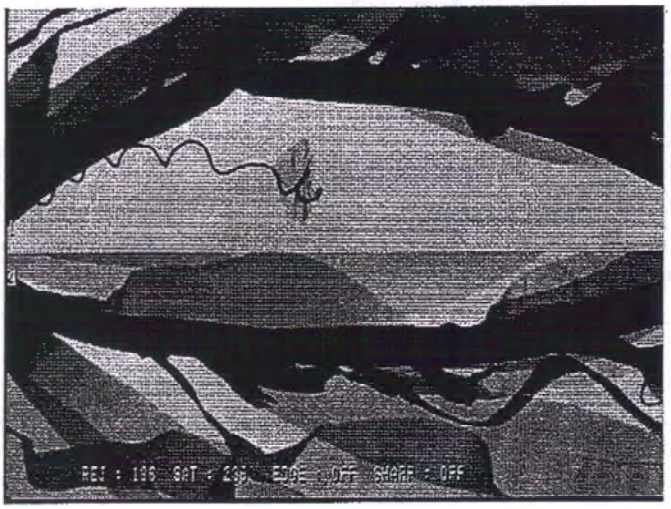


Picture 1 – The Crown of Edinburgh

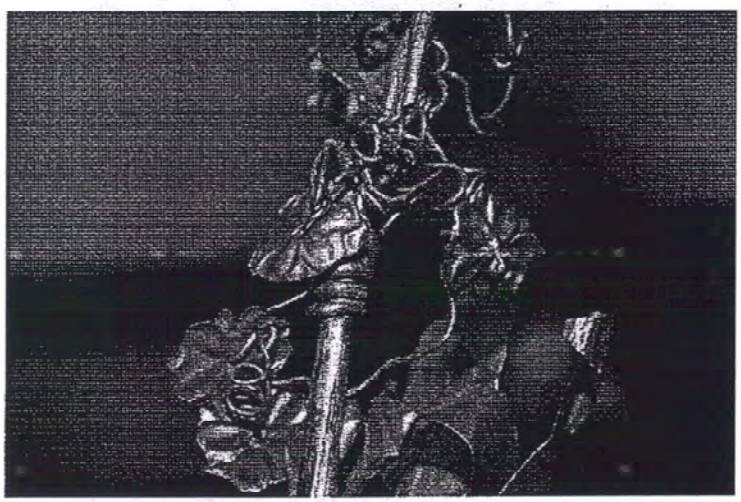


Picture 2 – The Crown of Edinburgh Leaves-Details

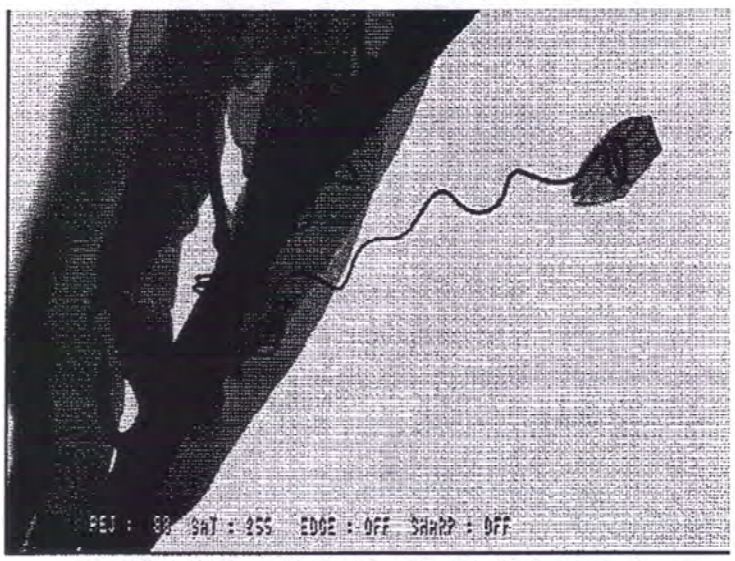


Picture 3 - The Crown of Edinburgh Leaves and Type of Attachment-Radiography

Technological features of the Crown of Edinburgh; such as soldering with gold of same characteristics and composition (pic.6) for the integration of parts (pic.4,5), integration style of pipe with sealing and cutting styles of leaves and rosettes of (pic.7,8) are consistent with the jewelry manufacturing techniques in the Hellenistic Period in Western Anatolia.

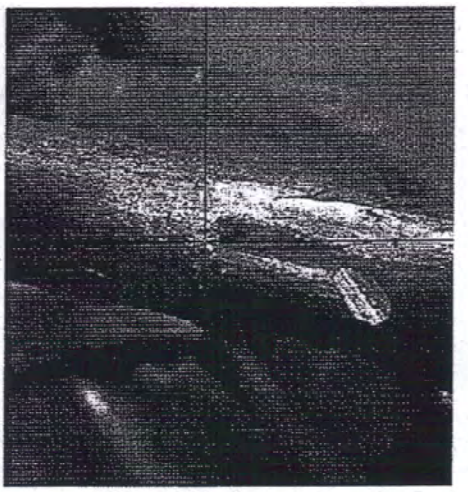


Picture 4 – The Crown of Edinburgh Rosettes and Type of Attachment-Details

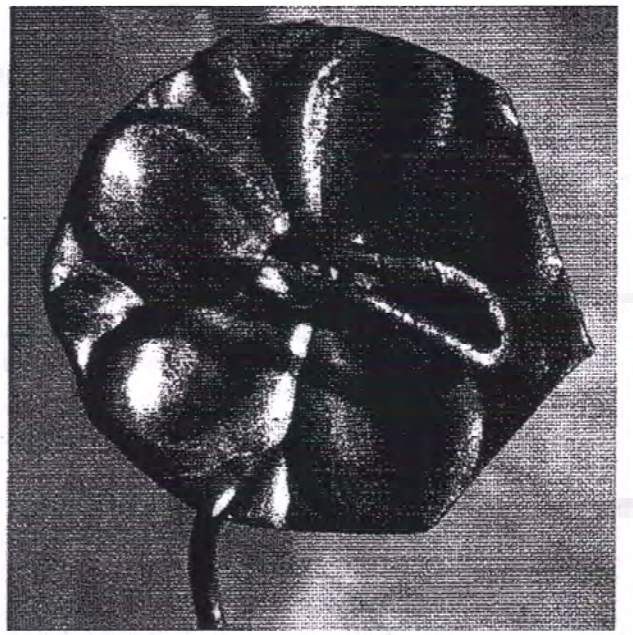


Picture 5 – The Crown of Edinburgh Rosettes and Type of Bonding-Radiography

7/1-32



Picture 6 - The Crown of Edinburgh Soldering-Details



Picture 7 – The Crown of Edinburgh Rosette Seal and Cutting Style-Details

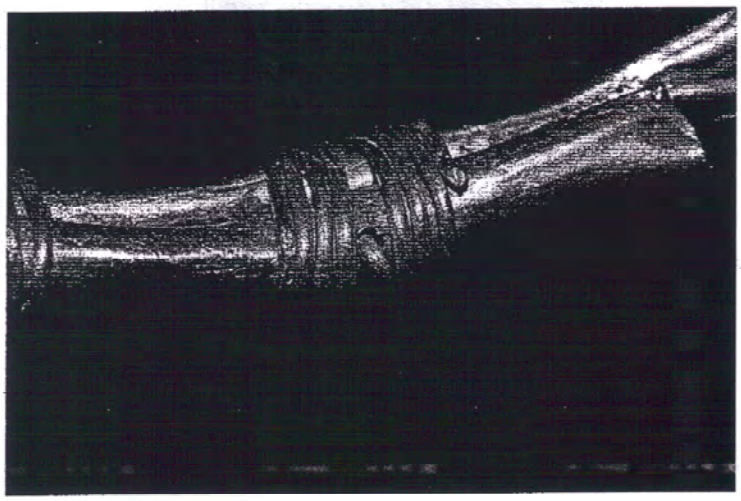
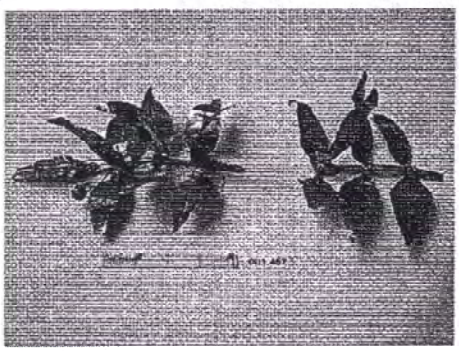


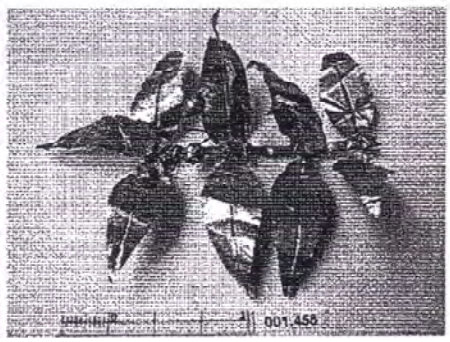
Figure 8 – The Crown of Edinburgh Bonding Style- Details

In order to analyze the aforementioned artifact analogically, it would be appropriate to compare with some similar examples found the archaeological excavations carried out by using scientific methods in Western Anatolia and undoubtedly original ones.

It is possible to say that the nearest typological examples of the Crown of Edinburgh exist on the land at the boundary of in present day Izmir. It shows similarities with the crowns found in Phokaia and currently on display with 1.457 (pic. 9), 1.458 (pic. 10), and 1.459 (pic. 11), 2.757 (pic. 12), 2.758 (pic. 13) inventory numbers at Izmir Museum .The long and thin leaf forms, the branch line bedecked in the middle and leaves binding the pipe with a thin stalk and flower of myrtle rising among leaves of the crowns particularly with 2.757 and 2.758 inventory number show that these types of crowns were produced flower with a specific template, in specific or associated workshops.

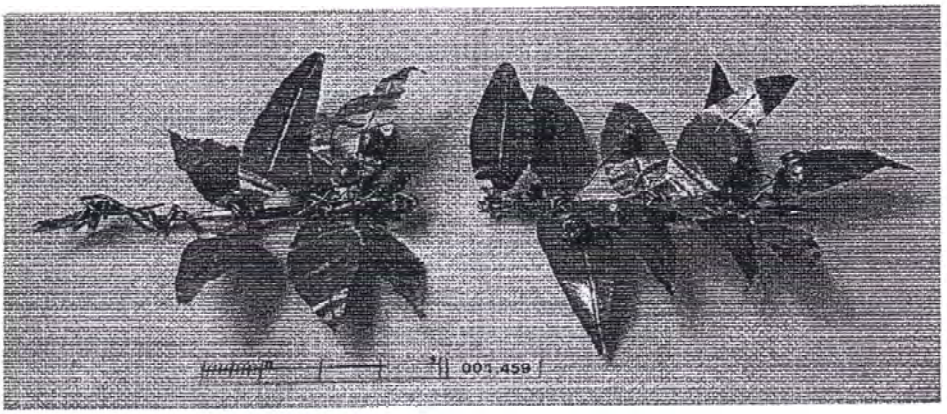


Picture 9 - Inv. No 001.457, Izmir

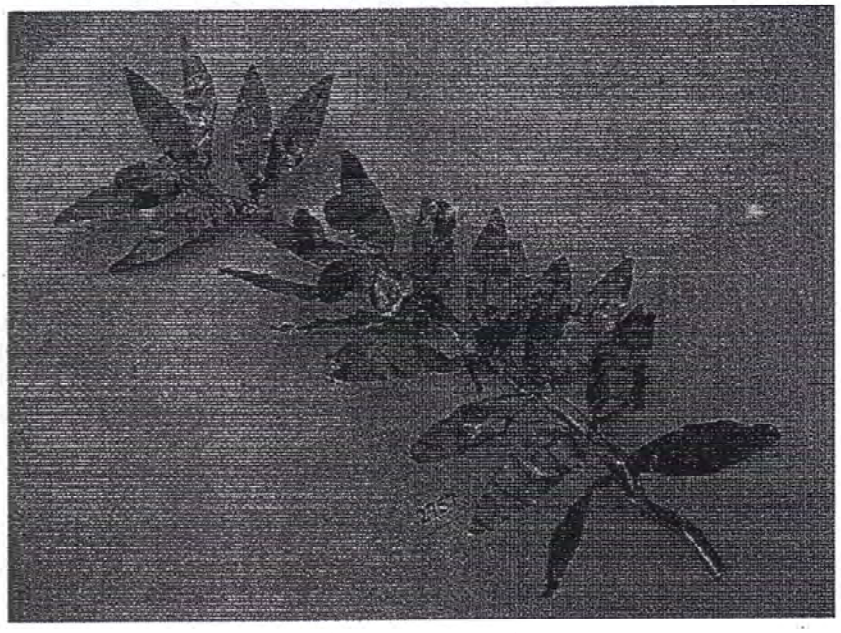


Picture 10 - Inv. No 001.458, Izmir

7/1-34

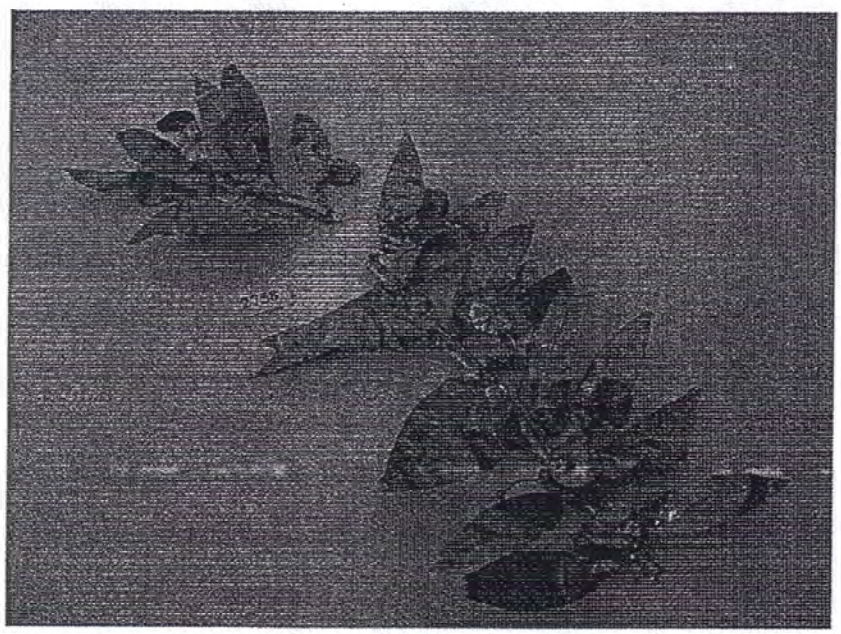


Picture 11 - Inv. No 001.459, Izmir



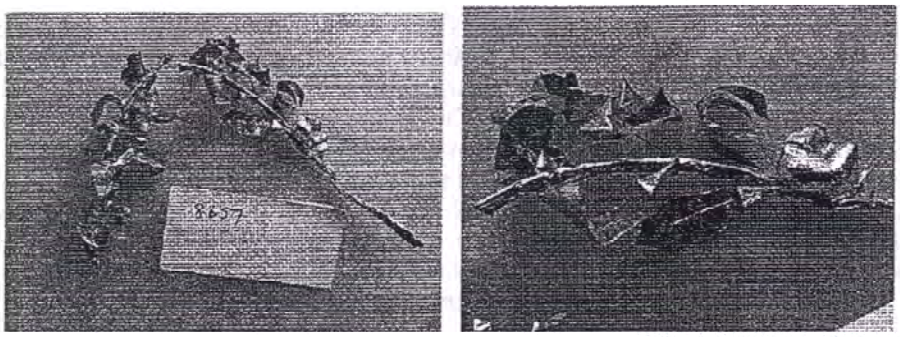
Picture12 - Inv. No 2.757, Izmir Museum

7/1-35

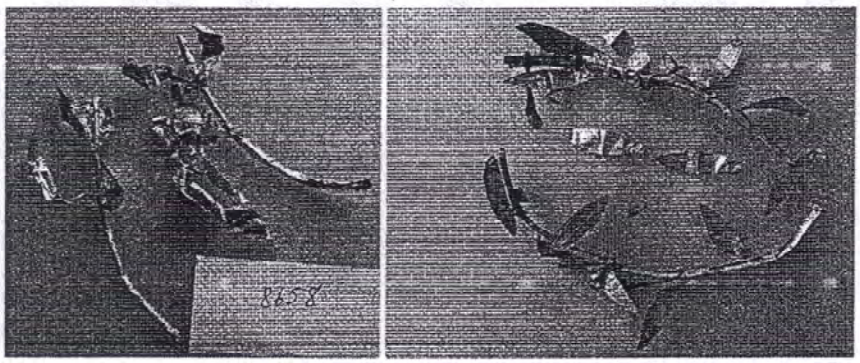


Picture 13 - Inv. No 2.758, Izmir Museum

Except the examples of Izmir Museum, typologically similar ones of the Crown of Edinburgh are also available in Canakkale Museum collection. These Troas originated samples are in the form of myrtle crown in terms of schematic composition and style. These examples differentiate technologically at some points from Edinburgh. Even if the crowns with 8657 (pic.14), 8658 (pic 15), 10664 (pic. 16) inventory number evaluated in this context resemble in the point of the schemas and leaf forms, it is clearly understood that the a thinner plate was used in the production of leaves and a different technique from the Edinburgh and Izmir artefacts carried out in the installation of leaves to the carrier pipe. The other myrtle crowns on display at the Canakkale Museum are the indicator of the intensity in this area. (See. pictures 17-18)

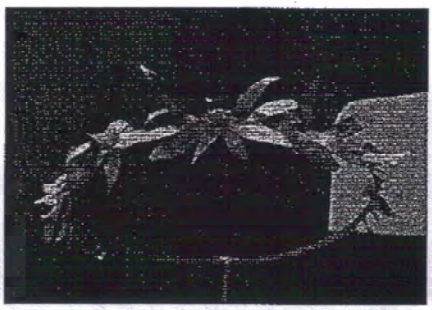


Picture 14 – Canakkale Muscum Inv. No 8657

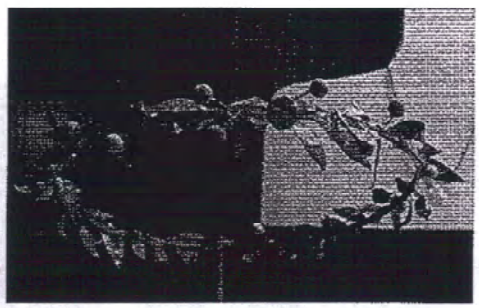


Picture 15 – Canakkale Museum Inv. No 8658

Picture 16 – Canakkale Museum Inv. No 10664

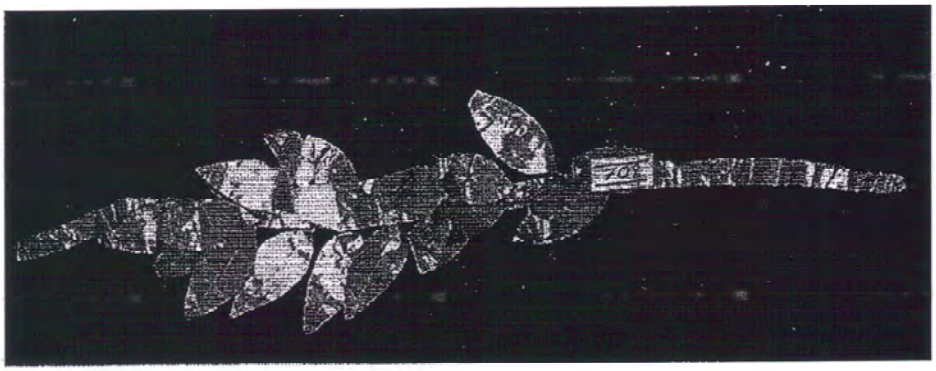


Picture 17 Canakkale Museum
Mersin Crown Inv. No 8658

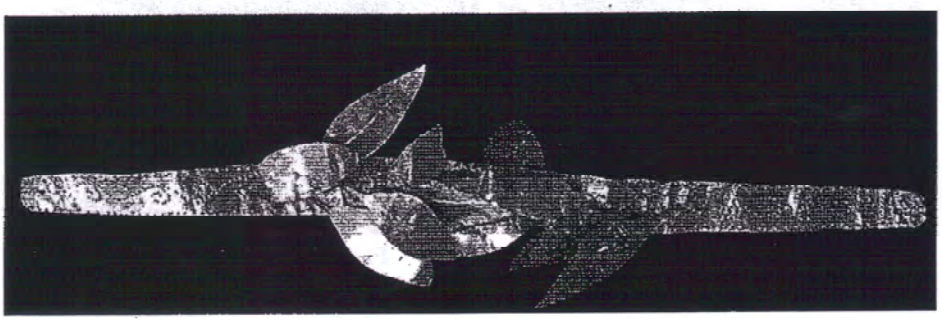


Picture 17 Canakkale Museum
Mersin Crown Inv. No 8658

Since the suspicion of theft on the Crown of Edinburgh from the burial chamber of from Hekatomnos Dynasty as a result of illegal excavations in Milas, Muğla is highlighted both in research and intelligence works carried out by the General Directorate for Cultural Heritage and Museums of the Ministry of Culture and in the archaeological evaluation report prepared by Ertekin Doksanalti, golden crowns and diadems in Milas Museum collection are included in the research. The schematic element analyses is below, additionally, comparison of some of artifacts found in Milas with the Crown of Edinburgh can also create an significant point of view. Although there exists no crown in the form of a myrtle leaf mounted on a pipe in Milas Museum collection, it is seen that a mixed composition is created by placing myrtle leaves on diadems with 709 and 743 inventory numbers in the collection (pictures 19-20)



Picture 19 – Milas Museum.- Inv. No 709



Picture 20 – Milas Museum.- Inv. No 743

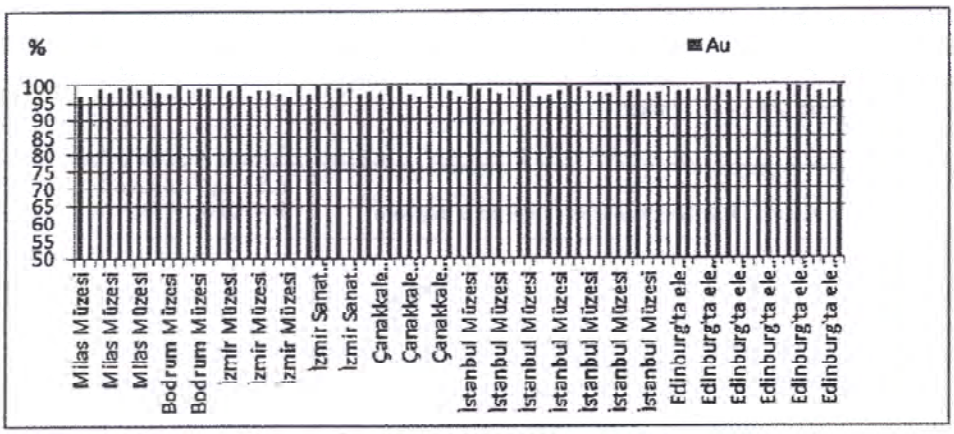
In this case, the Crown of Edinburgh has the features of traditional production technology and typology of jewelry workshops of Western Anatolia; it is possible to say that both in style and a schematic this artifact originated in Turkey. Since very close similar of the artifacts were found in the systematic excavations taken place in Western Anatolia supports this hypothesis, because jewelries are cultural property having the characteristics of in situs.

Evaluation of Analysis Results of Portable X-Ray Fluorescence Spectrometer

For the evaluation of chemical composition of the Crown of Edinburgh, values obtained from the analyses on the Hellenistic Golds in the laboratory archives of Museum of Anatolian Civilizations and the ones in the collection of some of the Western Anatolia Region Museums (Directorates of Mugla; Milas and Bodrum Museum, Izmir; Izmir Archaeology Museum and Izmir Museum of Art, Canakkale, Tekirdag, Kirklareli and Istanbul Archaeological Museums) by using portable X-Ray Fluorescence Spectroscopy (P-XRF)are taken into consideration. Evaluated 58 of 400 results of analyses are consistent with 19 analyses carried out on the Crown of Edinburgh in terms of the following features (Appendix).

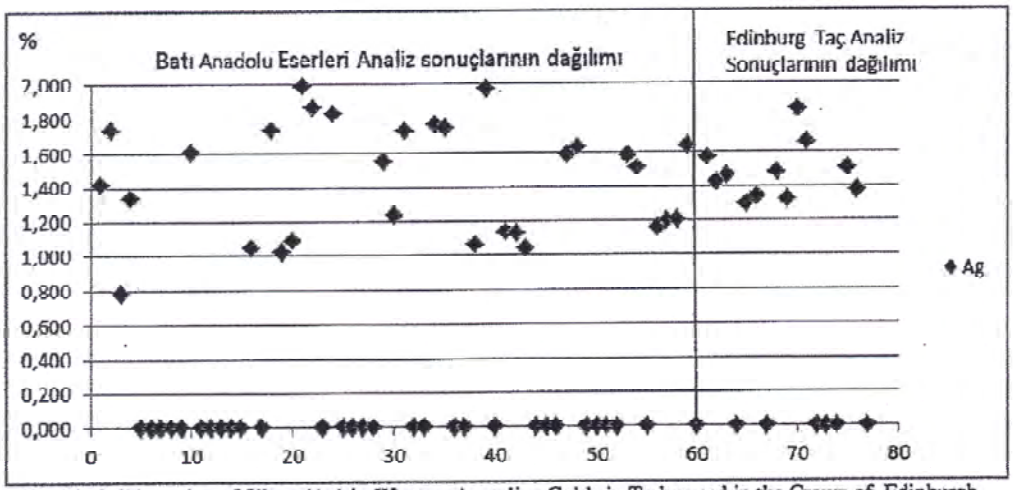
The P-XRF analysis results of the the Crown of Edinburgh and similar gold artifacts in the collections of West Anatolia Muscums can be interpreted in the following way;

Gold (Au): The results of the P-XRF analyses of Western Anatolian golds have 98.51% Au average; the Crown of Edinburgh has 98.62% Au average. The P-XRF minimum and maximum Au rates of Western Anatolian Hellenistic golds and the Crown of Edinburgh are the same (see Appendix and Graphic 1).



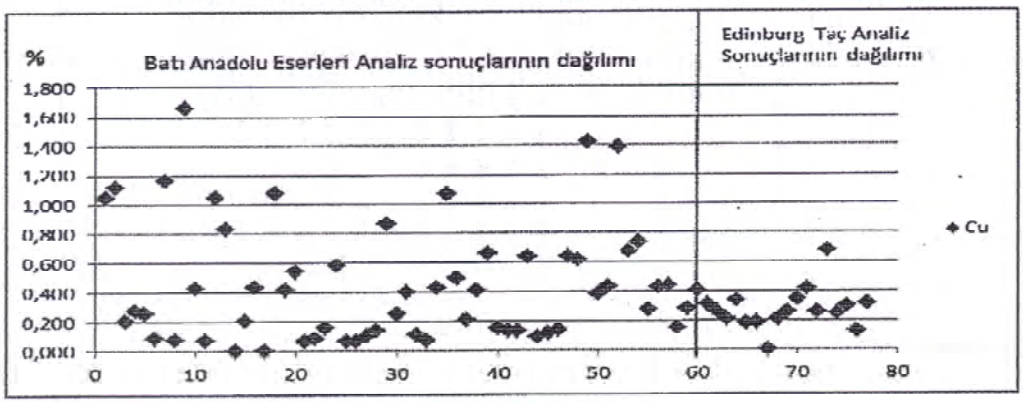
Graphic 1: Diagram of Au ratios of gold artifacts of Western Anatolia Museums and the Golden Crown of Edinburgh

Silver (Ag): The results of the P-XRF analyses of Western Anatolian artifacts have 1.43% Ag average. The Crown of Edinburgh has 1.49% Ag average. The Ag averages are completely consistent with each other. In addition, rates of Ag cluster on the same ranges. While Ag is detected in 30 of 58 analyses of Western Anatolian golds, it is detected in 12 of 19 analyses of the Crown of Edinburgh. Ag rates of Western Anatolia golds and the frequency of detection are very close to each other (see Appendix and Graphic 2).



Graphic 2: Dispersion of Silver (Ag) in Western Anatolian Golds in Turkey and in the Crown of Edinburgh.

Copper (Cu): The results of the P-XRF analyses of Western Anatolian artifacts have 0.49% Ag average. The crown of Edinburgh has 0.30% Ag average. The Cu averages are very close to each other. There are sudden ups and downs on averages or between the maximum and minimum values. In other words, the Cu ratios do not cluster on the same ranges. While Cu is detected in 55 of 58 analyses of Western Anatolian golds, it is detected in 18 of 19 analyses of The Crown of Edinburgh. (Appendix and Graphic 3) Frequency of using of copper is consistent with each other.

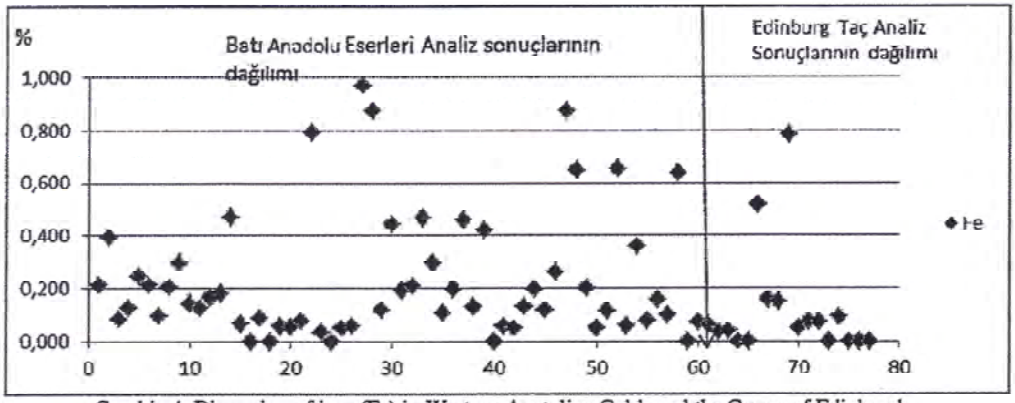


Graphic 3: Dispersion of Copper (Cu) in Western Anatolia Golds and the Crown of Edinburgh.

Iron (Fe): The results of the P-XRF analyses of Western Anatolian artifacts have 0.26% Fe average. The crown of Edinburgh has 0.17 % Fe average.

Minimum Fe ratios both in Western Anatolian and Edinburgh artifact are 0, 03 %. While in Western Anatolian artifacts maximum Fe ratio is 0, 97, it is 0, 78% in Edinburgh artifacts.

The Fu ratios in chemical composition of the artifacts do not cluster on the same ranges. (Appendix and Graphic 4).



Graphic 4: Dispersion of iron (Fe) in Western Anatolian Golds and the Crown of Edinburgh

Evaluation of Impurities of the Crown of Edinburgh and Western Anatolian Golds

In the analyses of Western Anatolian Golds and the Crown of Edinburgh, Tantalum **(Ta)**, Hafnium **(He)**, Vanadium **(V)**, Cobalt **(Co)**, Bismuth **(Bi)**, Rhodium **(Rh)**, Chromium **(Cr)**, Niobium **(Nb)**, Iridium **(Ir)**, Zinc **(Zn)**, Spelter **(Sn)**, and Molybdenum **(Mo)** are not detected. Absence of all these elements is one of the signs that Western Anatolian golds and the Crown of Edinburgh are made up of ores of the same raw materials sources.

Zirconium (Zr): Zirconium (Zr) is detected in only 1 of 58 analyses of Western Anatolian golds, it is not detected in any analysis of the Crown of Edinburgh

Titanium (Ti): Titanium (Ti) is detected only 2 of 58 analyses of Western Anatolian golds, it is detected in 1 analysis of the Crown of Edinburgh.

Manganese(Mn): Manganese (Mn) is detected 11 of 58 analyses of Western Anatolian golds, it is detected in 1 analysis of the Crown of Edinburgh.

Nickel (Ni): Nickel (Ni) is detected only 6 of 58 analyses of Western Anatolian golds, it is detected in 1 of 19 analyses of the Crown of Edinburgh.

Platinum (Pt): Platinum (Pt) is detected in only 3 of 58 analyses of Western Anatolian golds, it is not detected in 19 analyses of the Crown of Edinburgh

Absence or very rarely presence of these elements, considered as impurity, both in Western Anatolia golds and the crown of Edinburgh base the opinion that Western Anatolia golds and the Crown of Edinburgh are made up of same raw materials upon solid foundations . (Appendix).

Evaluation of Results of P-XRF by Using the Statistical Program:

For the understanding of the origin of Western Anatolian golds and the Crown of Endinburgh the P-XRF analysis results of these artefacts' grouping Dendrograms are formed (by using SPSS 16.0 program) with hierarchical clustering analysis method . When Dendrogram data is evaluated,it is seen that the chemical compositions of the Crown of Edinburgh and Western Anatolian golds clusters in six main groups.

- In the first group, the Crown of Edinburgh groups with the golds in **Istanbul** and **Izmir** Museums (Graphic 5).
- In the second group, the Crown of Edinburgh groups with **Milas** golds (Graphic 5).
- In the third group, the Crown of Edinburgh groups with **Canakkale** and **Istanbul** golds (Graphic 5).
- In the fourth group, the Crown of Edinburgh groups with **Bodrum, Izmir, Canakkale** and **Istanbul** golds (Graphic 5).
- In the fifth group, the Crown of Edinburgh groups with **Milas,Bodrum, Istanbul , Izmir** golds (Graphic 5).
- In the sixth group, the analysis results of the Crown of Edinburgh are consistent with **Pergamon** Crown and oak-leaf diadem in Canakkale Museum, which was seized from smugglers by Police (Graphic 5).

It is seen that the Crown of Edinburgh is always in the same groups with Izmir and Bodrum, Milas golds . Izmir, Bodrum and Milas are very close to each others. As mentioned in the analogical evaluation, the Crown of Edinburgh very often clusters in the same groups with the artefacts found in this geography, and this fact strengthens the possibility of being taken during illicit excavations carried out in an archaelogical area around Izmir and Bodrum Milas.

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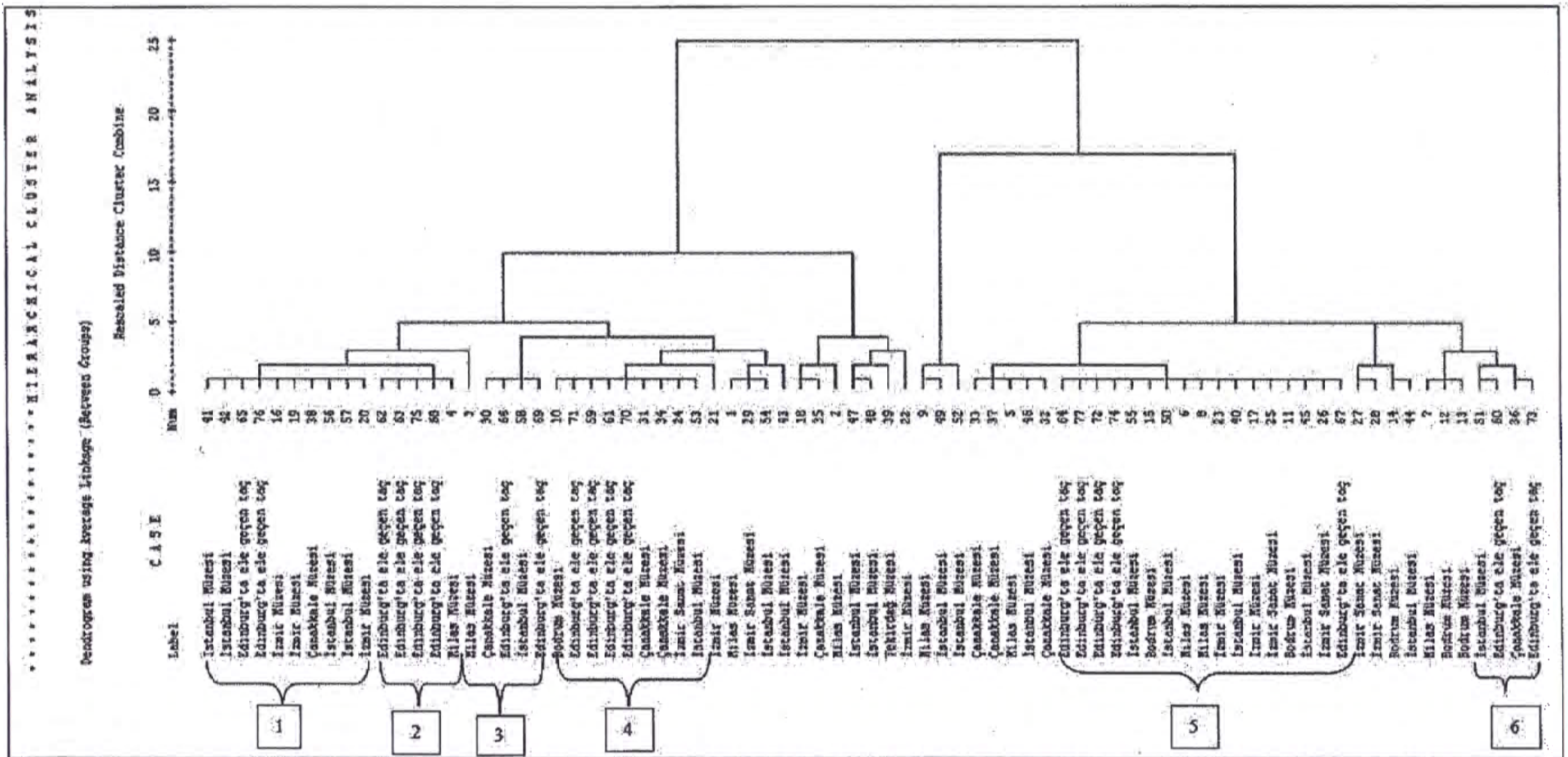

Figure 5: Batı Anadolu Altın Eserlerin ve Edinburgh Tacının SPSS 16.0 kullanılarak oluşturulan hiyerarşik kümeleme analizleri

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Correlation Accounts of the Crown of Edinburgh and West Anatolian Golds

Correlations					
		Au	Cu	Fe	Ag
Au	Pearson Correlation	1	-,547**	-,290*	-,870**
	Sig. (2-tailed)		,000	,027	,000
	N	58	58	58	58
Cu	Pearson Correlation	-,547**	1	-,009	,205
	Sig. (2-tailed)	,000		,949	,122
	N	58	58	58	58
Fe	Pearson Correlation	-,290*	-,009	1	,037
	Sig. (2-tailed)	,027	,949		,783
	N	58	58	58	58
Ag	Pearson Correlation	-,870**	,205	,037	1
	Sig. (2-tailed)	,000	,122	,783	
	N	58	58	58	58
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Table 1: Correlation of Analyzed Golds of Western Anatolia Museums

Correlations					
		Au	Cu	Fe	Ag
Au	Pearson Correlation	1	,006	-,345	-,939**
	Sig. (2-tailed)		,981	,148	,000
	N	19	19	19	19
Cu	Pearson Correlation	,006	1	-,212	-,170
	Sig. (2-tailed)	,981		,384	,486
	N	19	19	19	19
Fe	Pearson Correlation	-,345	-,212	1	,140
	Sig. (2-tailed)	,148	,384		,568
	N	19	19	19	19
Ag	Pearson Correlation	-,939**	-,170	,140	1
	Sig. (2-tailed)	,000	,486	,568	
	N	19	19	19	19
**. Correlation is significant at the 0.01 level (2-tailed).					

Table2: Correlation Table of anaylysis results of the Crown of Edinburgh

The correlation matrices of the Crown of Edinburgh and Western Anatolia golds' P-XRF analysis are plotted by using SPSS 16.0 and Pearson Correlation formula (Table 1 and Table 2) Correlation tables help to evaluate the relationship between elements. Correlation parameter indicates the relationship between two variance +1 correlation ratio indicates perfect positive correlation , -1 correlation ratio indicates the perfect negative correlation (Table 1-2)

Correlation ratios of the Crown of Edinburgh	**Correlation ratios of Western Anatolian Golds**
Au-Fe -0,345	Au-Fe: -0,290
Au-Ag -0,939	Au-Ag -0,870
Cu-Fe -0,212	Cu-Fe -0,009
Ag-Fe 0,140	Ag-Fe 0,037

Table 3: The common correlations of the Crown of Edinburgh and Western Anatolian Golds

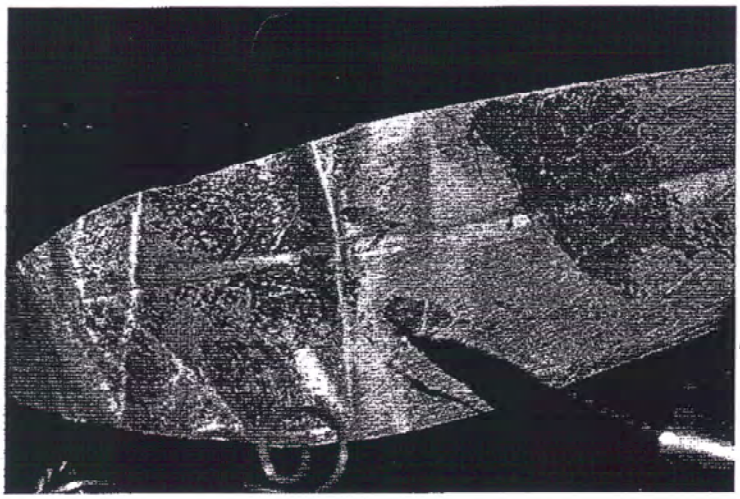
It can be easily understood from Table 3 that there are very close positive and negative correlations between Au-Fe, Au-Ag, Cu, Fe and Ag-Fe elements pairs of the Crown of Edinburgh and Western Anatolian golds.Such correlation similarities exist golds with same characteristics.

As a result, although , the relationship among the elements of the Crown of Edinburgh and the relationship among the elements of Western Anatolia are calculated seperately in the correlation analysis, they are completely consistent with each other in many ways.

Evaluation of Environmental Factors

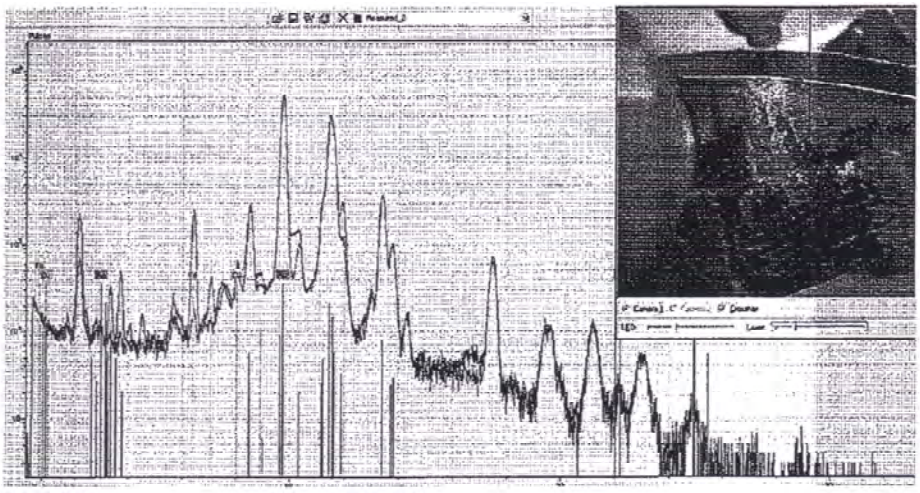
Turkish Atomic Energy Authority officials searched for signs regarding with in situ of the crown in the analyses with the μ-XRF Spectrometer.

By analyzing red and black stains on some leaves (pic. 21,22,23) with μ-XRF spectrometer device it is clearly understood that this stains are iron oxide deposits.It is emphasizes that there are tens of examples indicating this type of stains especially on gold findings from the burial environment in Western Anatolia.



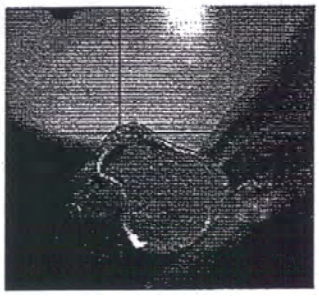
Picture 21 Staining on Some Leaves

Picture 22 – Red and Black Staining on Leaves-Detail

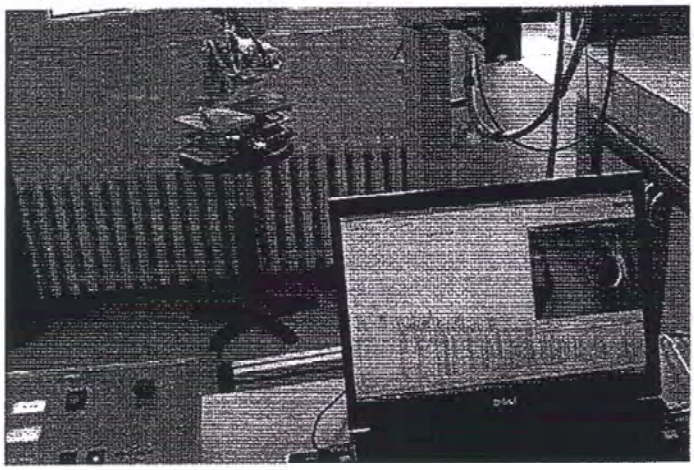


Resim 23- Red and Black Staining on Leaves- μ-XRF Analysis

As seen in the inspection report prepared by Turkish Atomic Energy Authority, trace amounts of soil deposit on the surfaces of the hollow cylinder pipe of the crown was detected through observation, hereon the study it was focused on this point (Picture 24,25). A nondestructive analysis of the deposit soil was carried out with the μ-XRF Spectrometer device, and it is still protected on the inner surface of the pipe forming the body of artifact



Picture 24- the Soil Residue in Pipe



Picture 25- the Analysis of the Soil Residue

After the soil deposit was detected on the the Crown of Edinburgh, analysis results of soil samples, (12 Locations in total) taken from locations where the similar golden artifacts were removed, compared with analysis results of the deposit soil on the Crown of Edinburgh.

Chemical compositions of some soil samples were identified and especially that of Milas Hekatomnid Tomb contains unprecedentedly high ratio of lead. (Table _4 and 5).

Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Zr	Ag	Sn	Au	Pb	Bi
3.02	ND	ND	0.76	65.69	ND	0.41	11.26	1.08	1.36	ND	ND	ND	15.96	0.46

Table_4 Analytical Mode p-XRF Analysis of Milas Hekatamnos Tomb's Soil Sample (weightvalues %)

S	Cl	K	Ca	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Rb	Sr	Zr	Ag	Sn	Au	Hg	Pb	Th
4709	1720	33343	187489	3924	106	104	785	39522	304	31	169	187	93	119	136	44	96	83	13	1956	61

Table_5 Soil Mod p-XRF Analysis of Milas Hekatamnos Tomb's Soil Sample (ppm values)

Despite the absence of lead in metal content of the Crown of Edinburgh, existence of lead in the content of the soil inside of the pipe indicates that this artifact is belonged to a land including high percentage of lead.

Very high percentage of lead in the content of soil such as the Mausoleum of Milas Hekatomnos' is very rare (Table 4 and 5). However, clearly detection of lead in milligram of soil is the strong evidence that indicates the Crown of Edinburgh was removed form Hekatomnid Mausoleum in Milas.

CONCLUSION:

With reference to evaluation of the Crown of Edinburgh by using monitoring, analogy and analysis methods, it is clear that the artifact can not be removed from almost every region around the Mediterranean Sea, it is supposed to be belonged to the coast of Western Anatolia in terms of regional and traditional evaluation. From this perspective, due to the specific detection of Turkish Atomic Energy Authority , the artifact which can be localized to Milas site, is supposed to been removed from illegal excavations carried out in Uzunyuva Mausoleum in Milas as stated in the archaeological report prepared earlier.

Respectfully submitted. March 28, 2013

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Appendix: The Crown of Edinburgh and Western Anatolian Hellenistic Golds
P-XRF (Portable X-Ray Fluorescence Spectrometry) Analysis Table