

**ANATOLIA ANTIQUA  
ESKİ ANADOLU**

**XXII**



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Olivier HENRY\*

avec Ayşe Güliz BİLGİN ALTINÖZ, Jesper BLID, Ömür Dünya ÇAKMAKLI,  
Andrew DUFTON, Agneta FRECCERO, Linda GOSNER, Ragnar HEDLUND,  
Pascal LEBOUTEILLER, Vasilica LUNGU, Felipe ROJAS, Fredrik TOBIN,  
Baptiste VERGNAUD et Andrew WATERS

## LA MISSION LABRAUNDA 2013 – RAPPORT PRELIMINAIRE

La mission Labraunda 2013 s'est déroulée du 05 août au 27 septembre 2013. La date de début, initialement prévue le 22 juillet, a dû être reportée à deux reprises suite à des difficultés administratives. Les opérations 2013 se sont déroulées sous l'égide du Musée archéologique de Milas, en cette période de transition de la direction du site, et nous sommes particulièrement redevable à Mr Ali Sinan Özbey, directeur du Musée, et à son représentant Suleyman Özgen pour l'aide et le soutien qu'ils nous ont apportés tout au long de la campagne.

La mission de cette année fut probablement la plus intense depuis les larges opérations de fouille des années 1970, puisqu'elle s'est déroulée avec 39 archéologues et 17 ouvriers plus une équipe de 11 personnes travaillant au projet de conservation/restauration de l'*Andron A*. Le budget particulièrement conséquent de cette année a pu être monté sur la base d'une collaboration internationale et en faisant intervenir des partenariats publics et privés<sup>1</sup>.

Cette année nous avons tenté, avec succès, de mener trois actions de front : fouille, documentation,

restauration et mise en valeur. Les fouilles ont concerné pour l'essentiel des zones qui se trouvent soit à l'intérieur soit à proximité immédiate de l'aire sacrée. Les programmes de documentation que nous avons mis en place depuis l'année dernière tentent de mettre à plat nos connaissances du site et des fouilles anciennes, qu'il s'agisse du matériel mis au jour ou de structures. Les conservations ont porté sur le matériel architectural en marbre et sur l'*Andron A* d'Idrieus. Enfin, la mise en valeur a été particulièrement efficace cette année et a porté à la fois sur une meilleure sécurisation du site, une meilleure information concernant ses vestiges et un déblayage des remblais de fouilles anciennes.

Les résultats de cette année ont été extrêmement satisfaisants. L'équipe internationale et interdisciplinaire que nous avons mise en place a fonctionné à plein rendement et offre de belles promesses pour l'avenir<sup>2</sup>. Le caractère international de cette équipe explique l'utilisation des langues françaises et anglaises dans le rapport qui suit.

\*) IFEA-USR3131, Istanbul.

1) Nous tenons à remercier ici l'ensemble des partenaires qui ont participé, directement ou indirectement, au financement de la mission 2013: ESAN/Eczacıbaşı, la fondation J.M. Kaplan, Labrandasällskapet, la municipalité de Milas, le Musée de Milas, la Vitterhetsakademien, le Ministère français des Affaires étrangères et du développement international, l'Université de Brown, le Swedish Research Institute in Istanbul, l'Université d'Uppsala, l'Institut Français d'Études Anatoliennes, Sven Kristensons resestipendium, The Royal Swedish Academy of Letters, History and Antiquities, A.W. Persson travel grants (Uppsala University), the Harald and Tonny Hagendahs memorial Foundation, The Helge Ax:son Johnson Foundation, Harald och Tonny Hagendahs minnesfond.

2) Les membres de l'équipe 2013 ont été (par ordre d'apparition sur le terrain): Olivier Henry, Ömür Çamaklı, Baptiste Vergnaud, Jesper Blid, Felipe Rojas, Andy Dufton, Linda Gosner, Marco Ziff, Laura Leddy, Christina DiFabio, Andrew Waters, Hilal Kuntuz, Ragnar Hedlund, İpek Dağlı, Melissa Cormier, Pascal Leboutellier, Fredrik Tobin, Lars Karlsson, Agneta Freccero, Erika Andersson, Victoria Bly, Anna Enberg, Kanwal Quadri, Anna Plahn, Adam Justin-Moll, Pontus Hellström, Katerina Stathi, Cansu Erik, Mehmet Cam, İsmail Coğalan, Yasin Durnaoğulları, Can Karavul, Vasilica Lungu, Güneş Sargüney, Merve Erkut, Célia Decalonne, Klara Borgström, Ömer Güngörmüş ; auxquels il faut ajouter l'équipe ayant travaillé à l'élaboration du projet de restauration de l'*Andron A*: Kemal Gülcen, Tamer Topal, Uğurhan Akyüz, Ayşe Güliz Bilgin Altınöz, Neriman Şahin Güçhan, Göze Akoğlu, Yasemin Didem Aktaş Erdem, Suna Kabasakal Coutignies, Yavuz Kaya, Filiz Diri, Barış Erdil.

## 1. LES PROJETS DE RESTAURATION/CONSERVATION

### 1.1. Conservation project of *Andron A*: intervention proposals as a response to values and problems (par A.G. Bilgin Altınöz, METU)

The *Andron A*, a monumental banquet hall built by Idrieus, is one of the most important remains of the archaeological site of Labraunda (Fig. 1). Since the re-discovery of Labraunda by the early excavations of the Swedish team in 1948, *Andron A* has been a central focus for both the field archaeologists as well as the visitors because of its exceptional state of preservation. As one of the most and first visible monumental building while approaching the site,



**Fig. 1 : The ‘image’ of *Andron A* within its physical and natural context in 1840s in Eugène Landron’s drawings** (Philippe Le Bas, *Voyage archéologique en Grèce et en Asie Mineure sous la direction de M. Philippe Le Bas (1842-1844). Planches de topographie, de sculpture et d’architecture, gravées d’après les dessins de E. Landron, publiées et commentées par Salomon Reinach, Paris 1888 : 47-48).*



**Fig. 2 : The ‘image’ of *Andron A* within its physical and natural context in 2012** (METU Project Team, 2012).

the image of *Andron A* has come to be a symbol for the site (Fig. 2). Due to its importance, since its discovery until today, the *Andron A* has been documented various times with different techniques.

Despite the fact that *Andron A* is still a partially unexcavated structure, due to various architectural, structural and material problems threatening the building and making it very fragile, there occurred an urgent need for an emergency conservation program. In this regard, a protocol between IFEA and METU was signed for the conservation project of *Andron A*, financially supported by the J.M. Kaplan Fund. The protocol covered research, documentation, analysis and laboratory studies, restitution and restoration projects, interim and final reports, technical documents for the implementation phase and program for monitoring and control after the implementation of the project. The project is led by a multidisciplinary team of specialists from METU in collaboration with the specialists from the archaeological team at Labraunda<sup>3</sup>. The project started in September 2012 and all the final documents and projects were sub-

3) The team is composed of the following members: A. Güliz Bilgin Altınöz [Asst. Prof. Dr., METU] Architect / Conservation Specialist, (Project Director); Suna Coutignies, [METU] Architect / Conservation Specialist; Filiz Diri [Specialist, METU] Architect / Conservation Specialist; Neriman Şahin Güçhan [Assoc. Prof. Dr., METU] Architect, Conservation Specialist (Consultant); Özgün Özçakır [Res. Asst., METU] Architect / Conservation Specialist; Leyla Etyemez [Res. Asst., METU] Architect / Conservation Specialist; Uğurhan Akyüz [Prof. Dr., METU] Civil Engineer; Barış Erdil [Res. Asst. Dr., Van 100. Yıl University] Civil Engineer; Tamer Topal [Prof. Dr., METU] Geological Engineer ; Göze Akoğlu [Asst. Prof. Dr., Mustafa Kemal University] Physicist, Specialist In Arhaeometry and Conservation; Yavuz Kaya [Res. Assist., METU] Geological Engineer; Kemal Gülcen [Specialist, METU] Cartographer, Photogrammetry Specialist; Pontus Hellström [Prof. Dr., Uppsala University, Department of Classical Archaeology and History of Ancient Period] Archaeologist; Thomas Thieme, [Dr.] Architect; Olivier Henry [Assoc. Prof. Dr., IFEA] Archaeologist, (Director of Labraunda Excavations); Lars Karlsson [Prof. Dr., Uppsala University, Department of Classical Archaeology and History of Ancient Period] Archaeologist (Swedish Excavation Team Leader 2004-2012). All studies are prepared with the valuable help of each of the members of all the excavation team to whom we owe gratitude.

mitted to IFEA as well as Muğla Regional Conservation Council for approval on June 2013<sup>4</sup>.

The conservation project for *Andron A* is prepared with a holistic approach considering all the architectural, geological, material, structural and contextual parameters. Consequently, architectural and contextual studies, geological and material studies, and structural studies are considered as the main tracks of the project all through the phases of research, survey, analysis and assessments. The outcomes of the studies of these tracks were supported and integrated with each other at the end of each phase as well as at the final stage while defining the conservation principles and interventions for *Andron A*.

The architectural research, survey, analysis and assessment track started with the documentation of the building together with its context<sup>5</sup>. The first phase of this was a metric and photographic documentation, which ended up with up-to-date measured drawings of the building and its nearby context. This provided a basis for the studies on the graphic restitution of the building, aiming at understanding the original building form and the changes occurring in time. The information coming from the excavation team and based on the archaeological evidences, measurements, documentations and observations at the site as well as the historical research and comparative studies were the main sources of information for restitution. Due to the fact that the archaeological research and excavations about *Andron A* have not been completed yet, the information about the building is also incomplete and hypothetic to a certain degree. Besides, as the *Andrones* in Labraunda are almost unique structures with no known totally similar and standing examples, it also becomes difficult to extract precise information from the comparative studies. Therefore, the restitution project had hypothetical or rather less reliable aspects. For this reason, the degrees of reliabilities were also shown over the restitution drawings. All in all, the restitution project helped to understand the possible original state of the building, keeping in mind that it can change in the future due to new findings together

with a systematic archaeological excavation and research.

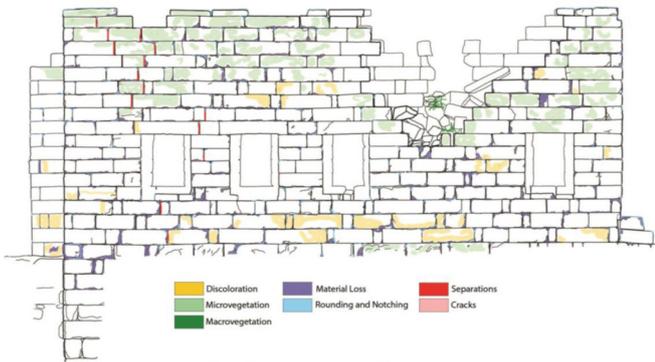
The outcomes of this track helped to define some of the intervention principles and criteria of the conservation project. Accordingly, the proposed conservation interventions should not prevent future interventions and excavations, thus they should be re-treatable. Besides, as the building is a still standing as a well-preserved and rare example of its type, its authenticity was considered as an important parameter. Thus the interventions were defined so as to have minimum intrusion on the original material, structure and details of the building and reversible as much as possible. Last but not least, due to the importance of the building for the site and its integrity with its context, *Andron A* cannot be regarded as an isolated building, but should be treated as part of an archaeological, previously sacred site and a broader cultural landscape that reflects a sense and spirit of the place. Therefore, the project on *Andron A* should aim at conservation, sustainability and the presentation of the building within its context, considering the balances within the site, site image and spirit of the whole site. As a result, the likely effects of interventions proposed by the project should not only be assessed while taking into account the building itself, but also as part of a whole.

The research, survey, analysis and assessment track on geology and materials started with the analysis of the geological aspects of the area<sup>6</sup>. These studies showed that Labraunda is within the first degree seismically active area. When a comparison between the state of the building in late 1940s with its current state is made, based on photographs taken during the early excavations, it can be seen that almost no recognizable change has occurred since then, even though important earthquakes happened in this region during this period. However, during the field survey, a systematic movement in south direction was observed in the stone blocks of different buildings at the site, possibly due to earthquake. Therefore, seismicity became one of the main parameter while considering the conservation project.

4) The architectural, geological, material, structural research, survey, analysis and assessments as well as the restitution project were completed in 2012. The outcomes of these studies were already published by myself in Henry *et al.* 2013, 310-322. The 2013 studies covered the final assessments. Based on these assessments the development of alternatives, and the preparation of the Restoration Project for *Andron A* including the interventions, their implementation processes and monitoring after implementations. As this article aims to cover the whole project, 2012 studies are re-mentioned in addition to 2013 studies.

5) The studies in this track, including the architectural survey, restitution project and restoration project, were made by Asst. Prof. Dr. A. Güliz Bilgin Altınöz, Cons. Arch. Suna Coutignies, Cons. Arch. Filiz Diri, Assoc. Prof. Dr. Neriman Şahin Güçhan. The measurings were made by Architectural Surveyor Kemal Gülcen and Cons. Arch. Filiz Diri. Prof. Dr. Pontus Hellström and Dr. Thomas Thieme contributed to the restitution project. Cons. Arch. Özgün Özçakır and Cons. Arch. Leyla Etyemez contributed during the preparation of the final drawings of the restoration project.

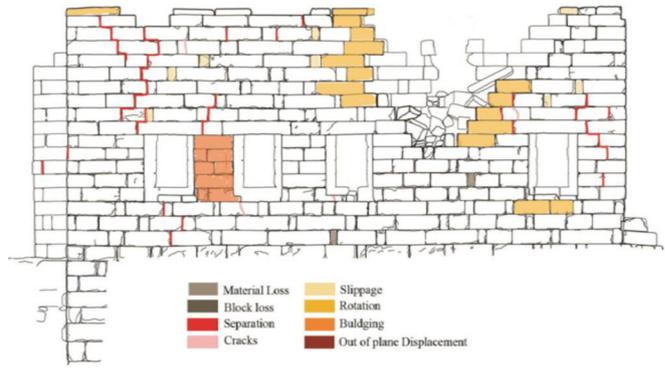
6) The studies in this track were conducted by Prof. Dr. Tamer Topal, Asst. Prof. Dr. Göze Akoğlu and Res. Asst. Yavuz Kaya.



**Fig. 3 : Mapping of visual weathering forms on south facade** (© METU, 2012).

As a part of the geological and material studies, stone samples with no archaeological importance were collected for laboratory analysis. Density, sound velocity, porosity, XRD mineralogical analysis and petrographic analyzes by optical microscopy of thin sections were conducted over these samples, in order to define the physical and physico-mechanical properties of these rocks. It revealed that the building stones used in the *Andron A* are gneiss, with high unit weight, effective porosity, low water absorption and cation-exchange capacity. Hence, their field performances are good, as long as they are used horizontally parallel to their foliation planes and as long as their contact with water is controlled through good drainage. The observations during the site survey also proved that most of the material problems such as discoloration, flaking, surface relief, rounding and notching at the edges of the blocks and material loss in the upper parts of the building are due to repeated contact with rainwater from surfaces and from the top (Fig. 3).

Thereupon, providing water drainage and delimiting the water entry in between the gneiss blocks from the top or from surfaces of the walls have been among the main concerns of the conservation project. Besides, another common form of degradation is the loss of material by eruptions due to the effects of plant roots growing on the walls, which necessitated intervention. There are also micro vegetation such as fungi, algae and lichens. However, as no clear adverse effects of them could be visualized and as removing them is a destructive process causing loss of material from the surface, it is proposed not to intervene on them at the moment, but to monitor their effects on the stone walls in time.



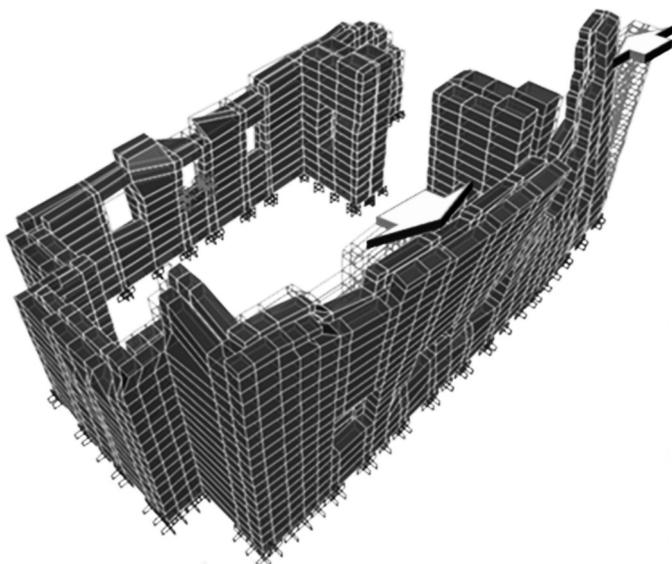
**Fig. 4 : Mapping of structural problems on south facade** (© METU, 2012).

The major conservation issue in *Andron A* is related to its structural stability. Thereupon, comprehensive understanding of the structural condition and of the structural damages became one of the major concerns and tracks of the project<sup>7</sup>. As the first stage of the structural studies, structural problems were detected during the site survey, which were then mapped on the measured drawings of the building. Accordingly, material loss, block loss, separation, slippage, rotation, bulging and out of plane displacement are the structural problems which can be visualized in *Andron A* (Fig. 4).

For further analysis and assessments of the structural behavior and problems of the building, a finite element model with a macro modeling approach was created based on the measured drawings (Fig. 5). The analysis over the model helped both understanding the current structural condition and behavior of the building as well as making projections about its future condition and behavior under different forces.

All these studies revealed that the main problem of the building is the out-of-plane movement under possible seismic forces acting in a north-south direction. The structural problems are mostly concentrated on the south wall, which is leaning towards the south. This leaning causes the separation of the two wall shells, which can be easily visualized through the recessed headers. There are also noticeable vertical cracks on the west wall and the back-wall of the *pronaos* due to the leaning of the south wall. In addition to this, on the upper part of the south wall a triangular area is totally destroyed. Moreover, a horizontal bulging at the base part of the south wall can be visualized. Considering the seismic sen-

<sup>7</sup> The track on structural studies including the structural survey, analysis, assessments and the development of proposals for strengthening, were conducted by Prof. Dr. Uğurhan Akyüz and Asst. Prof. Dr. Barış Erdil. Dr. Yasemin Didem Aktaş contributed to this track during the preliminary modeling stage.



**Fig. 5 : Finite element model of Andron A**  
(© METU, 2012).

sitivity of the site revealed by the geological studies, even with a small vibration, there is high risk of collapse of the south wall, which will affect the stability of the whole building. As a result of all these problems, the building becomes structurally fragile and open to further destruction. Thereupon, the major concern of the conservation project has been providing the structural stability and sustainability of the building by creating a regular force distribution, preventing the separation and decreasing the displacements associated with drifts, and increasing the stiffness of the south wall.

The procedure, approach, principles and the intervention criteria of the conservation project of *Andron A* are defined in consideration with the character, properties and problems of the building together with its context and in view of the international conservation principles and criteria<sup>8</sup>, which are defined as **minimum intervention, reversibility, re-treatability, sustainability, authenticity, spirit of place, integrity, safety and stability**.

As a next step, different alternatives were developed in order to provide the structural stability of the building. All of the alternatives were then assessed according to the settled conservation principles and criteria.

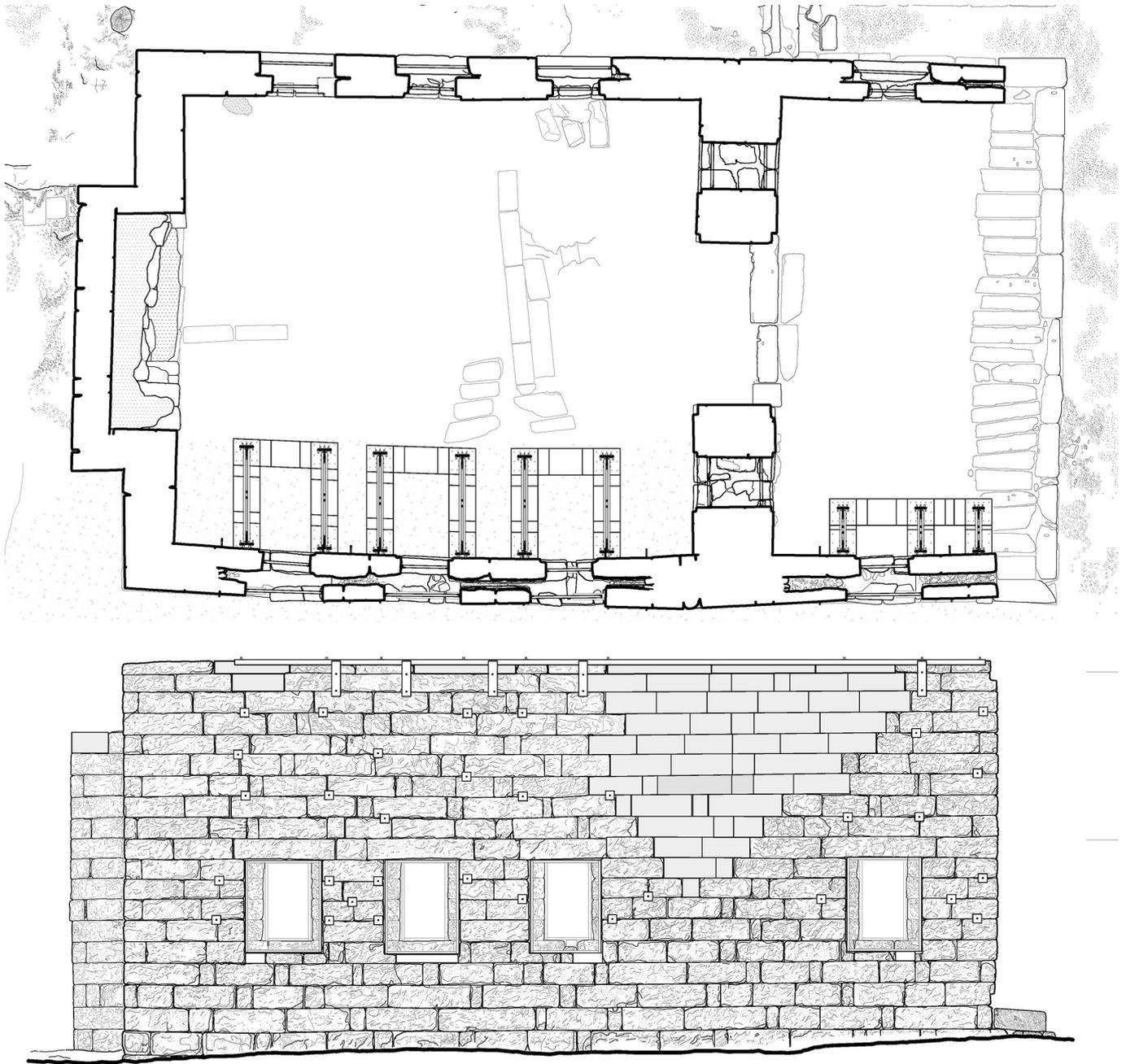
In this regard, the first alternative proposed strengthening by reconstructing the south wall. This requires the dismantling of the south wall block by block, and then reconstructing it by using the original stone blocks in their original places as much as possible. In this case, as the friction and integrity between the stone blocks will be lost due to dismantling, it will be necessary while re-constructing to increase the stiffness by using shear keys made of steel bars and longitudinal reinforcements. Therefore, each block would need to be connected with the adjacent ones by the help of longitudinal bars placed via epoxy injection into the holes that should be drilled in each block. Although this alternative does not disturb the ‘image’ of *Andron A*, the intervention itself is too invasive and not reversible. Besides, it needs a perfect workmanship, otherwise the end result can be a failure. All these remarks led us to discard this alternative.

Strengthening with channel profiles or with IPE profiles were two other alternatives. However, both of these interventions were neither minimum nor reversible, while they also were disturbing the image of the building and consequently the sense of place too much.

The fourth alternative considered strengthening the south wall with truss from exterior. In this alternative, there are no direct intervention on the wall itself and the whole process is non-destructive and reversible. However, this alternative would seriously disturb the ‘image’ of *Andron A* and the sense of place. Besides, if this alternative is realized then it cannot be possible to conduct further excavations outside the building, which surely will be necessary in the near future.

The fifth and last alternative aims at strengthening the wall with truss from the interior. Contrary to the previous one, this alternative is re-treatable; it will have a very small visual effect on the ‘image’ of *Andron A* and the sense of place from the outside. However from inside, there will be a visible steel structure. In this alternative, the steel structure will be connected to the wall through steel bars. Therefore, some slight destructive interventions are unavoidable, as holes are needed for steel bars. However, in order to make this intervention as minimum as possible the steel bars are located to pass through the joints in-between the stone blocks.

8) Main International documents referred to are: (1992) European Convention on the Protection of the Archaeological Heritage (revised), Council of Europe, Valetta; (1999) Burra Charter: Charter for the Conservation of Places of Cultural Significance, Australia ICOMOS, Burra; (2003) ISCARSAH Principles. ICOMOS Charter- Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage; (2008) Ename Charter: ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites, ICOMOS, Québec; (2008) Québec Declaration on the Preservation of the Spirit of Place, ICOMOS, Québec.



**Fig. 6 : The restoration drawings: plan and south facade (© METU, 2013).**

The assessment of all these alternatives denoted that none of them could totally fulfill all the defined conservation principles and criteria. Among all, the fifth alternative, which is strengthening with truss from the interior, is the most proper one. Therefore, the conservation project of *Andron A* is prepared according to this solution. The conservation project covered the restoration drawings as well as the presentation of the conservation interventions together

with their detailed descriptions and implementation processes (Fig. 6).

Accordingly, conservation project covers the following interventions implemented in a sequence:

- doing the preparatory works for conservation interventions and conservation of the original floor plasters;
- supporting the south wall with a temporary scaffolding;



**Fig. 7 : Cleaning of a corinthian capital from the north Stoa** (photo : A. Freccero).

- taking down the unstable and unsafe stone blocks on the south façade;
- supporting the window openings with steel frames;
- filling the cracks and gaps on the walls with repair mortar;
- intervening to the macro vegetation;
- re-stabilizing the lost and deformed parts of the south and east walls by putting back the slipped or slid stones into their original places, changing the existing blocks in bad condition with new gneiss blocks and constructing the lost part of the south facade with gneiss stone blocks in order to provide the structural stability between the south wall and the back wall of the *pronaos*;
- constructing the steel truss strengthening system;
- capping the top of the walls in order to avoid water penetration in between the walls from the top.

This conservation project has not been an end, but it should be considered as a beginning of an ongoing process for conservation and sustainability of *Andron A*. Only after the implementation of this project, it will be possible to start the archaeological excavations which can reveal new evidences about the building. Then after, based on more solid data, the conservation project can be revised and new interventions can be proposed and implemented. Meanwhile, within this process a conservation and management plan for Labraunda should also be prepared, which will provide a holistic approach and an integrated consideration towards different excavations and conservation interventions taking place in different parts of the site.

## 1.2. The Marble conservation at Labraunda

(par A. Freccero, restauratrice indépendante)

During last year's campaign the conservator graduate and the two archaeologists participating

were able only to stay at the site during one week and I worked on my own for the remaining two weeks. At the end of the period it was impossible to anticipate the situation for next year and therefore conservation was planned for one or two persons. Instead, the conservation group expanded and four students from the building conservation program at the University of Gotland joined the project. Erika Andersson, graduate of the conservation program at Gothenburg University, participated for the third time, now as my assistant. Conservation was carried through as a two-week stage. Traditional graphical and verbal documentation methods were part of the training, which in its practical part consisted of cleaning, consolidation, attachment of fragments, and preparation of stucco for infillings. Excursions to the archaeological sites at Iasos, Euromos, Stratonikeia and Lagina were part of the program, aiming at making the students familiar with the Mediterranean culture at different periods in antiquity, as well as looking at marble and discussing conservation methods and problems related to the different sites. We also visited antique quarries at Euromos and Iasos. Evaluation of previously made conservation was made during the first working day, as was the annual inspection of the test slab – the large slab on which a series of different consolidation substances were previously tested.

Conservation was concentrated to the North Stoa and the five Corinthian capitals of the colonnade that remain (Fig. 7). Two capitals had been prepared last year when they were treated with biocide, as was the large column drum at *Andron B* (Fig. 8). Two objects found in earth this year were cleaned and consolidated. One of these was a frail fragment of an anta capital, and the second was a large fragment of an architrave with inscription (inv. K81) at the South Propylaea. After being found and registered in 1949, the fragment had at some time fallen and been broken into two parts with the inscribed side in the earth. As the broken blocks were lifted the inscription was identified and placed to the left of the entrance of the gateway. A portion of the central part including some letters is missing (Fig. 9). A few minor rearrangements were made at the South Propylaea in connection with the replacement of the broken architrave. The first part of the left side of the architrave, inv. K4, was placed beside the inscribed part, and a fragment of the pediment positioned upon it. Further, the capital of the left anta was placed on an inscribed anta block, thereby approximately mirroring the arrangement on the right hand side, with the anta capital conserved in 2011.



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