Conservation of Classical Monuments:
A Study of Anastylosis
with Case Studies from Greece and Turkey

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by

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To my parents Kleovoulos and Ourania
and my sister Andromahi

Στους γονείς μου Κλεόβουλο και Ουρανία
και στην αδερφή μου Ανδρομάχη

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ABSTRACT

Anastylosis involves the re-assembly of existing, but dispersed, members of a monument and is implemented within a framework for the preservation and presentation of ancient monuments. It was introduced as a concept and practice in the 19th century. Anastylosis is encountered throughout the world, but most often in the Mediterranean region. This research explores the concept of anastylosis in the region, and specifically examines how it as applied to classical monuments in Greece and Turkey.

The thesis examines the terminology, philosophy, theoretical principles and technical issues of anastylosis, within the wider context of cultural heritage management. Case studies from Greece and Turkey, and a survey of anastylosis practitioners, are used to identify and investigate relevant issues. In addition, a small visitor survey examines the understanding of anastylosis by the public, the impact for interpretation of monuments, and highlights the role of stakeholders in conservation activities. Problematic areas in decision-making, planning, implementation, and post-implementation are identified, raising concerns over its definition, objectives, theory, driving forces, and technical matters. These are analysed with reference to current and future practise.

Building on this analysis, the thesis concludes by establishing guidance for the use of anastylosis; this is specifically aimed at Greece and Turkey, but has wider applications, both within the region and at an international scale. The approach recognises the importance of anastylosis as a tool within the wider field of heritage conservation and management and offers a framework for planning, decision-making, implementation, and post-implementation. Specific theoretical principles and technical matters are proposed.

In advocating a clearer definition of what anastylosis encompasses, and how it can be implemented within the overall framework of theoretical and technical aspects for the care and preservation of the material remains of our past, the research concludes by asserting the importance of anastylosis as an architectural conservation method, with significant interpretative potential, in the management and presentation of archaeological sites.

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ABBREVIATIONS

AA Archaeological Association

CAC Central Archaeological Council

CCAM Committee for the Conservation of the Acropolis Monuments

CCAMAL Committee for the Consolidation and Anastylosis of the Monuments of the Acropolis of Lindos

CCEM Committee for the Conservation of the Epidauros Monuments

GA 9th General Assembly and Symposium of ICOMOS

HE Hellenic Association

HMC Hellenic Ministry of Culture

ICCROM International Centre for the Study of Preservation and Restoration of Cultural Property

ICOMOS International Council On Monuments and Sites

IGME Institute of Geological and Mineral Exploration

SRAM Service for the Restoration of the Acropolis Monuments

UNESCO United Nations Educational, Scientific and Cultural Organisation

CHAPTER 1: INTRODUCTION

1.1 Background

Anastylosis is a type of intervention implemented in the framework of preservation and presentation of ancient monuments. It was introduced as a concept and practice at the beginning of the 19th century, when theories of protection and conservation of archaeological heritage were systematised. In the international conservation charters, it is endorsed as a justifiable form of architectural conservation. Its application in monuments during the 21st century is influenced by current concepts of heritage management and conservation.

Thus, anastylosis is an intervention with a historical progress and significance in the care and maintenance of archaeological monuments. In this sense, it is closely related to conservation and interpretation of monuments and the debates accompanying these issues, such as minimum intervention, authenticity, education, cultural and national identities, and assessment of values. The manner and extent of the practice often associate it with reconstruction, which is implemented mainly for reasons of improving the legibility and enhancing the interpretation of a monument.

Examples of anastylosis are encountered throughout the world, but more often than anywhere else in the Mediterranean region. Therefore, it becomes an important method of architectural conservation and presentation in the area. Although it complies with theories and rules of current practices, there are still grey areas in its definition, understanding, and planning. The reasons and driving forces behind its implementation show its importance in conservation decisions. Philosophical questioning is not alien to the concept too. The technical aspects of its implementation highlight its dependence on scientific and technological developments in the field. Practical applications are often inconsistent, while technical problematic matters regularly rise. Questions about effective anastylosis applications have recently emerged and led to suggestions of introducing a specific methodology for its implementation.

In this regard, anastylosis becomes an important type of intervention to ancient monuments throughout the world, especially in the Mediterranean region. The ongoing debate on its best practice indicates its significance as a conservation method and a stage of decision-making process in the management of archaeological sites and monuments. Hence, the need for an all-inclusive understanding of the method, a clearer theory, and guidelines for its practical implementation in order to effectively resolve problems emerges.

1.2 Research questions and aims

The principal aim of this study is to explore the concept and practice of anastylosis as applied to monuments in the Mediterranean region, by focusing on case studies from Greece and Turkey.

Specifically, I provide a brief historical overview of how anastylosis emerged as an intervention approach to ancient monuments and study how it developed as such. Moreover, this study explores issues related to its definition (terminological and etymological questions); the reasons and aims of its application, including the driving forces influencing relevant decisions; the established theoretical framework, such as the principles guiding the intervention (minimum intervention theories, respect for values and authenticity) and further delineated principles (reversibility, respect for the structure and architecture of the monument); and philosophical speculations, mainly concerning aesthetics and the creation of modern ruins. The relation of anastylosis with other intervention approaches, such as minimal intervention or managed decay, restoration and reconstruction, conservation and stabilisation, are explored, including the reasons for resorting to the specific method. Further problematic areas and technical aspects related to its planning and implementation are analysed and discussed. Thus, the strengths and weaknesses of anastylosis are highlighted. The ways in which these are dealt with, either effectively or not, are revealed and a suggested methodology for resolving them is established. In the meantime, the future of anastylosis, from all its diverse aspects, is explored regarding its successful planning and implementation.

1.2.1 Specific objectives

The thesis explores anastylosis as applied to ruined and previously restored monuments of classical antiquity in Greece and Turkey. The specific objectives relate to the following issues:

- ***What is the historical background of anastylosis?***

Anastylosis has a long history from its first appearance in the 1st century AD. In its re-appearance, in the beginning of the 19th century, it has been implemented within diverse contexts. Technical matters and theoretical principles were and are still raised. Past procedures are worth exploring in order to identify differences and similarities between past and current anastylosis applications.

The above aim is examined in Chapter 3 and is analytically discussed through some of the case studies (Chapter 4). Specifically, the choice of the Parthenon and the Erechtheion in the Athenian Acropolis and the Hellenistic Stoa in Lindos reflects the objective of examining issues related to past anastylosis applications. The comments of professionals in the survey (Chapter 6) highlight and contextualise the historical development of anastylosis.

- ***What does the concept and practice of anastylosis currently entail?***

Anastylosis is included among the methods of architectural conservation internationally. It is widely practiced on ruined or previously restored archaeological monuments of the Mediterranean region. It has become an intervention strategy, decided and implemented as part of heritage management and within the framework of the international restoration theory. It is strongly connected to matters of presentation and interpretation of monuments. A broad range of technical and practical aspects dictate the manner of its planning and implementation.

Yet, when confronted with a ruin various types of intervention may be chosen and applied. Therefore, it is essential to establish the reasons for which anastylosis is chosen among the wide range of conservation and presentation methods. Defining anastylosis in relation to these kinds of intervention, clarifying their similarities and differences, and assessing its success compared to these other interventions contributes to its delineation as a conservation and presentation method.

On the other hand, anastylosis is linked to particular types of structures and to specific geographical locations, primarily the Mediterranean. It is also defined with relation to its manner and extent, as well as in relation to its aims. Thus, establishment and confirmation of these parameters assist in defining it.

This aim is achieved by exploring the current ideas on anastylosis as encountered in the relevant literature (Chapter 3) and the opinions of professionals extracted by a survey (Chapter 6). However, the primary source of information becomes the case studies (Chapters 4, 5), with the investigation of reasons that led to the decision on anastylosis and the aims that it sought to achieve, as well as the investigation of technical matters.

➢ *Why is it important to define principles and standards of the concept and practice of anastylosis?*

Architectural conservation is guided by theories and principles that developed during the last two centuries and are still evolving. These theories are enhanced by the determined reasons, aims, and approaches to conservation and preservation activities. They are accompanied by scientific experimentation and technological advances. Theoretical and philosophical speculations on current approaches result in considerable advanced attitudes towards heritage.

Anastylosis, on the other hand, has a long history and, since the mid-20th century it is endorsed as a justified form of architectural conservation through international conservation charters. Though it has applications worldwide, it is frequently practised in the Mediterranean region. It is strongly linked with the preservation and presentation of monuments and is subjected to all relevant debates and theories. Thus, it is important to explore the significance of anastylosis as a term, concept and method, which, in turn, will reveal why anastylosis should have determined principles and standards.

Examination of issues and debates of heritage conservation and management (Chapter 2) highlights the inclusion of anastylosis within the wider framework of the field. Examination of case studies covering the extensive range of anastylosis issues

(Chapters 4, 5) and exploration of the opinion of professionals and the public (Chapter 6) indicate the significance of anastylosis as a management and conservation strategy and the importance of establishing principles and policies for its implementation.

- *What are the driving forces that dictate anastylosis implementation and why?*

The driving forces play a considerable role in the development of conservation and preservation approaches towards archaeological monuments. Interpretation and education, experiment and research, tourism development, local and cultural identities explain the increasing number of extensive interventions. They are interrelated and can be equally misused. Anastylosis is guided and performed under the justification and motivation provided by these driving forces. Which are these forces? How influential are they in anastylosis implementation? How and to what degree do they determine the extent of intervention?

The above are explored in the overview of the current context of heritage management and conservation (Chapter 2) and the outline of the history and modern practice of anastylosis (Chapters 3, 4, 5), as well as through the opinions of heritage experts (Chapter 6).

- *What are the issues related to decision-making, planning, implementation, and post-implementation of anastylosis?*

During the process of deciding, planning, and implementing anastylosis multiple issues are worth identifying and clarifying. These are related to management and infrastructure matters; the collaboration of disciplines; the accuracy of published data after examining the undertaken works; the issue of consultation of and provision of information to interested individuals and the general public; and various matters that may rise in individual projects.

These aspects are drawn out from the overview of the context of heritage management (Chapter 2), the current issues of anastylosis (Chapter 3), and the examination of the case studies (Chapters 4, 5), and are further analysed in the discussion (Chapter 7).

➤ *What, if any, are the problems and complications associated with the application of the method, and how do they arise?*

A wide range of issues arise from deciding, planning, and applying anastylosis:

- terminological (use of the term in the international conservation vocabulary, its etymology, its variation in different contexts and languages);
- philosophical (approaches to assessing the results and successes of the method, influenced by philosophical perspectives on aesthetics);
- theoretical (delineation of principles, relation with the theoretical concepts of restoration, inclusion in international conservation charters, enhancement of the values of monuments and their context; establishment of the method as a strategy of site management; importance of understanding public perceptions); and
- technical (type of monuments with relation to their architecture, structure, geographical location; use of original material with regard to its state of preservation and amount, incorporation of new material for completing missing parts, sufficiency or not of the original structural supporting system; use of ancient or new methods, techniques and tools, and co-operation of disciplines).

These issues are identified in the chapter on anastylosis theories and practices (Chapter 3) and are explored in detail throughout the case studies (Chapters 4, 5) and the professional survey (Chapter 6). Problematic matters are further deliberated in Chapter 7.

➤ *What should be an appropriate anastylosis methodology, given the type of monuments it is applied to, the technical issues and problems arising during its implementation, and the current restoration and management theories?*

The issues related to anastylosis decisions, planning and implementation are identified and explored in-depth. Its application in the international sphere is acknowledged and its wider importance in the Mediterranean region is explored, with particular emphasis on Greece and Turkey. Its principles are identified and established. Problematic areas are highlighted and efforts to resolve problems are identified. All the above are explored through the historical overview of anastylosis (Chapter 3) and the investigation of case studies (Chapters 4, 5), as well as through the opinions of professionals and the public (Chapter 6). They are all drawn together in the general discussion (Chapter 7).

The final aim becomes the delineation of a methodological approach to anastylosis that deals with subsequent problems and assists practitioners in employing it for preserving and presenting ancient monuments. This approach provides an inclusive definition of anastylosis and delineates the stages in deciding, planning, and implementing the method, while it identifies problematic matters and suggests ways of resolving them. This methodology is drawn out from the discussion of Chapter 7 and is presented in Chapter 8.

1.3 Selection of study area

Despite having international validity, anastylosis seems to be widely known and applied mainly in classical monuments of the Mediterranean region. This is the reason why this study focuses on the Mediterranean area and case studies have been chosen from the monuments dated in the classical antiquity and from the geographical region in which most examples are encountered.

Anastylosis is broadly relevant to the Mediterranean as far as cultural contexts and structural type and building materials are concerned. Yet, Greece and Turkey were deliberately selected. Many examples of anastylosis are encountered there, since an abundance of monuments with the specified structure and building material (the structural type to which anastylosis can be applied coincides with classical monuments, found throughout Greece and in the west coast of Turkey).

Pragmatic reasons contributed to the selection too. The cultural context is quite similar in both countries. Greece was primarily selected because access to monuments and collection of information was much easier for a Greek national. Turkey could easily be accessed from Greece and combined visits could be arranged.

Besides, the legislative framework is quite similar in both countries, where restoration directorates co-ordinate the works undertaken either by their employees and relevant bodies or even by foreign archaeological schools. Some monuments in Greece are subjected to systematised efforts of anastylosis and availability of information was ensured. Even though access to unpublished reports was limited, bureaucratic, or non-existent as a concept, the existing literature and published reports of the undertaken works provided all essential information. The anastylosis projects in Turkey were undertaken by foreign archaeological schools, whose scholars agreed to supply information or commentaries about the projects, while their work was published in international journals and sources, to which access was straightforward.

The number of the monuments selected was limited to eight. This restricted quantity of examples was decided upon the depth in which each project could be explored. An extensive number of case studies would not allow for detailed presentation and analysis of the issues aimed to be scrutinised. A rather smaller sample of monuments subjected to anastylosis would permit meticulous examination of the wide range of emerging issues.

The selection of one case study from each Mediterranean country was rejected on the basis that different samples from each country may not have been representative examples. Selection of more than two examples from each country, and even from the same archaeological site within a country, would ensure that possible differences in approaches could be noted and discussed. Furthermore, all Mediterranean countries have diverse legislative frameworks, which would be difficult to assess and present, as well as to approach so as to collect the desired information and perform the research in practical terms. For instance, visits to the relevant sites to examine and photograph the monuments in question were easily and efficiently organised and realised, once relevant permissions were acquired.

Additionally, absence of case studies restored according to national conservation charters, such as the two Italian charters for restoration, was deliberate. These two charters are referred to in this research as examples of adaptation of international restoration principles to the context of the heritage of a particular country. Thus, examination of Italian case studies was eliminated from the research. This choice was enhanced by the unavailability of publications and literature about anastylosis of monuments in Italy, in combination with the extent and volume of information that was already collected for monuments from Greece and Turkey.

1.4 Research methods

The applied research methodology was formulated with a view of exploring many perspectives, which included:

1.4.1 Literature review

The debate on anastylosis is situated within the wider cultural resource management theory and practice. The literature review includes the current issues in site management and conservation within which the process of anastylosis is undertaken (Chapters 2, 3).

Specifically, a brief outline of the history of architectural conservation and restoration aims at indicating the development of restoration theory and philosophy. Then, the overview of theories and practices of heritage conservation and management provides an insight of current debates and tendencies that influence anastylosis principles and practices. The overview of the concept and practice of anastylosis identifies the current issues. A historical synopsis provides information on the emergence of the concept. The broad examination of terminological, theoretical, philosophical, and technical aspects related to it, becomes the starting point of the exploration of issues.

1.4.2 Case studies in the application of anastylosis

Case studies of monuments in which anastylosis has been or is currently being implemented are selected, examined, and analytically discussed. Information is extracted by investigating them on a practical case-by-case basis.

1.4.2.1 Criteria for selecting the case studies

Key purpose of the case studies is to extract information on the process of deciding, planning, and implementing anastylosis and to assess the end result from various perspectives, especially its success and the achievement of the desired objectives. The number of case studies was governed by the possibility of exploring in-depth the above-mentioned issues. Therefore, criteria were established for their selection. However, during the selection of the case studies, it became hard to choose monuments that fulfilled all prerequisites. A degree of compromise had then to be employed, according to which criteria were divided between essential and desirable.

The essential ones were the following:

I. Chronological distribution of projects:

a. *Monuments subjected to anastylosis after 1964*, when anastylosis was endorsed as an acceptable method of architectural conservation in the *Venice Charter*. This is the most recent charter that deals directly with anastylosis and is followed in projects throughout the Mediterranean (Demas 1997b, 152). Examination of monuments subjected to anastylosis after its establishment would denote certain issues.

b. *Monuments subjected to anastylosis recently*. Debates on the validity and effectiveness of the *Venice Charter* are currently expressed, dividing the conservation community. In this sense, it would be elucidating to review how anastylosis approaches have changed and evolved during the course of time.

II. Specific structure of monuments: dry masonry and autonomous structural members. As it will be shown in the subsequent chapters, the monuments to which anastylosis is applied have a specific structure: they are originally erected with regularly cut pieces of stone, connected to each other with little or no mortar and small metallic joints (see Dimacopoulos 1985, 18; Bouras in AA 1996, 26). In order to thoroughly explore anastylosis, such monuments had to be examined.

III. Availability of documentation with studies, preparatory reports, and final publications. Documentation is of great importance, since a sufficient amount of data is needed for a comprehensive presentation of the monument and examination of the undertaken works. Reports highlighted emerging issues and informed about principles and standards that were followed.

The desirable criteria are:

I. Projects describing the undertaken anastylosis according to the international definition of the word: 'reinstatement of any original fragments that may be recovered' (*Athens Charter*, Article VI), or 're-assembly of existing but dismembered parts' (*Venice Charter*, Article 15). Since the research aims evolve focus on the study of anastylosis, its international definition should coincide with the description of the undertaken works.

II. Proximity or direct reference to the international conservation charters, especially the *Athens Charter* (1931) and the *Venice Charter* (1964). Both charters officially defined and endorsed anastylosis. The objective becomes the examination of their validity and sufficiency in guiding such works. However, reference to conservation charters was not judged as fundamental, simply because its absence could indicate their insignificance and, possibly, invalidity for anastylosis.

III. Chronological distribution of projects. Monuments subjected to anastylosis after 1931. In the *Athens Charter* (1931), anastylosis acquired its official definition. Hence, it would be interesting to examine how the method was planned and applied at these times. Due to the small number of publications regarding anastylosis works undertaken in the first half of the 20th century, it was decided to establish this criterion as a desirable one and examine case studies that combined anastylosis projects undertaken in the 1930's and recently, so as to identify differences in approaches.

1.4.2.2 Selection of case studies

The selected case studies meet all essential criteria and some desired ones and are the following:

a. The Parthenon and the Erechtheion of the Acropolis of Athens, Greece.

Efforts to re-erect the monuments took place in the 20th century, allowing comparative analysis of the undertaken works. The interventions are clearly identified as anastylosis, as it was the restorer of the Acropolis who introduced the term in the International Conference in Athens in 1931. Works currently undertaken utilise the *Venice Charter* as their theoretical guide, the structure of the monuments is articulated with dry masonry and individual structural members. The available documentation is exceptionally rich and easily accessible, due to its distribution to university and other libraries. Thus, it fulfilled all essential and desired criteria.

b. The Avaton and the Propylon of the Gymnasium at the Sanctuary of Asklepios in Epidauros, Greece.

Anastylosis and restoration works are carried out in these monuments from 1984, and have not been completed yet. The works undertaken are described as anastylosis according to its international definition, the structure of the monuments follows the ancient system of individual members, while the *Venice Charter* forms the theoretical guide. Relevant publications are available in university libraries. Thus, the monuments fulfilled all essential criteria and I and II of the desired ones.

c. The Hellenistic Stoa at the Acropolis of Lindos in Rhodes, Greece.

Anastylosis works took place in 1912-1945 and from the 1990s onwards. The *Venice Charter* provides the theoretical background for the current works, which are not clearly defined as anastylosis. The structural system is in accordance with the relevant criterion. Publications, after partial completion of the project, were available. The monument satisfied all essential criteria, together with II and III of the desired ones.

d. The Library of Celsus in Ephesus, Turkey.

Anastylosis of the façade took place in 1970-1978, the restorers used the *Venice Charter* as their philosophical guide, though they did not refer to it directly, and the structure of the monument comprises of individual members. Documentation was widely available, in published articles, mainly in German, and only a few in English. This project fulfilled all essential and I and II of the desired criteria.

e. The Temple of Trajan at Pergamon, Turkey.

Anastylosis, defined as such, was implemented in the 1990s. There is no reference to charters, despite the fact that the principles respected during the course of works are identical to those endorsed by the *Venice Charter*. The building follows the structure of classical and Roman buildings. Documentation was available in the form of published articles distributed in journals. The works satisfy desired criteria I and II and all essential ones.

f. The Hellenistic Nymphaeum of Sagalassos, Turkey.

Anastylosis, undertaken during the 1990s, is completed and is described as such, though the *Venice Charter* is not mentioned. The structure of the building consists of dry masonry and individual members, while information is available in publications. Thus, the project fulfilled the desired criterion I and all essential ones.

These specific monuments, and not others from the numerous examples found in Greece and Turkey, were chosen because: they form indicative examples since they are popular tourist and educational destinations of visitors; they were easily accessible, in terms of arranging visits; information on their anastylosis was acquired relatively quickly and easily; professionals who have worked or are currently working in the projects participated in the professional survey (see 1.4.3). However, in some of them, the anastylosis works have not been completed yet, a matter that was not judged as essential for the exploration of relevant issues.

1.4.2.3 Approaches to the case studies

A series of consistent topics were identified. The key research areas focused on the:

- decision-making process
- planning of the works;
- implementation of anastylosis;
- post-implementation aspects.

The process of examining the case studies consisted of the following stages:

- Gathering of information regarding primarily the undertaken anastylosis and, also, the history of the monument and the site in which it is found. University and other libraries, together with archaeological and conservation databases were searched in order to collect information needed for each monument. Then, published data was brought together and was accordingly organised.
- Contacting committees and organisations responsible for the anastylosis projects, including site managers, restorers, archaeologists, architects, and so on. This stage is presented in the section about the professional survey (1.4.3).
- Meticulous study of the monument in question through the data presented in the published resources. The study was inclusive of the architecture and archaeology of the monument and the site. Emphasis was placed on the anastylosis work carried out with regard to its choice, planning, and implementation.
- Field visits to the selected archaeological sites. All the case studies were visited in order to examine the conduct and outcome of the anastylosis, with the exception of the Nymphaeum of Sagalassos. Each field visit consisted of my spending considerable time on site, looking at the site and the worksite, assessing the monument in question and the accuracy of the published data, and undertaking photographic surveys. In those monuments that were at the time being restored, I could not access their interior, due to health and safety regulations. The photographic material collected contributed in highlighting and understanding the issues raised from the study of the monuments.

- Assessment of the anastylosis project. It comprises a brief presentation of the architecture of the monument and its state of preservation and an inclusive outline of the anastylosis programme. Detailed discussion of the objectives of the restorers and their possible achievement follows, together with analytical exploration of the theoretical framework and the practical implementation of the works, as well as an assessment of the project. Specifically, the key-research areas and their sub-themes in the case studies are the following:
  - ➢ decision-making process – reasons for choosing anastylosis; advantages and disadvantages of the choice and the final result; objectives sought to be achieved; anastylosis as strategy for the conservation and management of the monument and site; assessment of the published data and its correspondence to the actual work; quality of documentation before and during the intervention; driving forces that influenced the choice and manner of anastylosis; collaboration of diverse disciplines; role of the public and provision of adequate information to them;
  - ➢ planning of works – theoretical framework of the anastylosis; methodology of restorers; respected principles; issues of authenticity and reversibility;
  - ➢ implementation of anastylosis – technical matters associated with it, such as: the percentage of new and original stone; the extent of intervention; issues of structural stability; the use of new and traditional techniques and tools;
  - ➢ post-implementation aspects – documentation after the intervention and any other stages after completion of the works.

1.4.2.4 How the results were used

The case studies served the same role as the professional survey (see 1.4.3). Each case presented variety and diversity of approaches regarding the practice. Thus, the research was enriched with further problematic situations and adopted solutions. Similar issues were identified and compared, while diverse ones signified the individuality of cases. The chronological exploration enabled delineation of the way in which anastylosis projects were carried out. Consequently, trends and similarities and differences in past and current approaches were identified.

1.4.3 Survey among professionals in the field of architectural conservation

Survey research is one method of collecting, organising, and analysing data, which can be collected by a variety of techniques (De Vaus 2002, 5). A survey among professionals of architectural conservation was conducted to collect information for describing, comparing, and analysing attitudes and practices of anastylosis. It evolved with the aim of exploring the views of professionals, rather than providing numerical data and statistical analysis. It was planned and designed in accordance to general surveying rules (see De Vaus 2002, Fink 1995, Newman and McNeil 1998). It included identification of the survey objectives, selecting and designing survey instruments, selecting survey participants in accordance to set criteria, administering the survey tools, collecting the data and presenting and analysing its results.

1.4.3.1 Objectives of the survey

Surveys involve setting objectives for information collection, designing research, preparing a data collection instrument, administering the instrument, analysing the data, and reporting the results (Fink 1995, 1).

The objectives of a survey form the statement of its 'hoped-for outcomes' (Fink 1995, 6-9). In this sense, the objective of the professional survey was to identify and explore the emerging problems and issues implicating the choice, decision, planning and implementation of anastylosis. These objectives reflected the purpose of the survey and acted as a guide to its choice and development (Newman and McNeil 1998, 3). Specifically, the research questions evolved around the following issues: definition of anastylosis, theoretical and philosophical issues, driving forces, technical aspects, the role of international conservation charters, management issues relating to procedures, and reflections of the way forward. As Fink (1995, 10) and Newman and McNeil (1998, 19-24) underline, the survey objectives derive from a defined need, from reviews of the literature and other surveys, as well as from experts. In this regard and given the lack of relevant surveys in the field, the survey objectives derived mainly from the literature reviews, in which the need for defining and determining anastylosis standards and principles and for improved interventions, within the context of architectural conservation and heritage management, was identified.

1.4.3.2 Methodology of the survey

The survey design followed the descriptive format, according to which information on practices and relevant issues was extracted from the respondents (see Fink 1995, 25). The next step was to prepare a reliable and valid data collection instrument (Fink 1995, 1 and 41). Two particular types of survey instruments (Fink 1995, 42) were employed: self-administered questionnaires and interviews in person. To these, correspondence via letters and emails was added, decided upon difficulties of professionals to respond to the questionnaire, since it admittedly required some amount of time to answer the questions. Additionally, a few professionals preferred not to respond to specific questions, mainly due to their limited participation in anastylosis projects, but rather to outline their views in simplest forms. Moreover, because of difficulties that emerged from attempting to interview in person, interviews and mail correspondence were combined into one survey instrument: general correspondence. The use of each survey instrument depended on the possibility of contact and availability of the interviewee, on available resources (in terms of time and costs), and on the kind of information to be extracted from each professional.

a. Self-administered questionnaire

A self-administered questionnaire consists of questions one completes by oneself and is either mailed or computerised (see Fink 1995, 42; Newman and McNeil 1998, 25-26). The questionnaire was extensively utilised, since it allowed for time, consideration and planning of answers, as well as for the possibility of including comments and suggesting references. It extracted detailed information and provided the participants a certain flexibility to answer at their convenience. It overcame obstacles, such as geographic locations, costly and stressful phone calls, which do not allow for analytical responses.

The procedure followed for administering the print questionnaire included the postage of a hard copy, together with a covering letter explaining the scope of the undertaken research to participants. To elicit a higher percentage of responses, upon receipt of a sufficient amount of completed questionnaires, a brief report is currently prepared for circulation among participants. The report outlines the responses to each question and the general outcome of the survey. The above process was followed in accordance to guidelines for promoting responses, as they are presented by Fink (1995, 38 and 89).

Additionally, a digital version of the questionnaire was designed and published at the web (http://www.ucl.ac.uk/~tcrnkva/index.html). Its structure and design were the exact ones used in the print questionnaire. Emails and requests for completion were circulated among conservation, heritage, archaeological, and architectural newsgroups and discussion or mailing lists (Heritage List, Conservation-Research List, and Conservation DistList). The digital form was adopted to ensure a wider participation. It bridged gaps created by geographical distances or unavailability of contact information for various participants.

The questionnaire is entitled *'Anastylosis Questionnaire for Relevant Professionals'* (Appendix B1). *Guidelines* for completing it explain general aspects of the questions and include instructions on how to answer them. The *Main Body* is divided into six sections, each dealing with the multitude of issues related to anastylosis.

The first section, entitled Definition of Anastylosis, explores how professionals perceive anastylosis. In sequence, main differences and similarities between anastylosis, restoration, reconstruction, and the grounds on which they are applied, are explored. The geographical location of monuments subjected to anastylosis is brought under question, together with the importance of a more complex and detailed definition of the method than the one provided by the *Venice Charter*.

The following section, entitled Theoretical and Philosophical Issues – Driving Forces, enquires after the theoretical framework embracing anastylosis applications (reasons for anastylosis application; issues of integrity, authenticity, interpretation, preservation of historic memory, and respect for values) and assesses the role of the driving forces (national and cultural identity, education in relation to interpretation and improvement of the legibility of the monument, tourism and financial aspects).

The section on Technical Issues combines questions scrutinising the technicalities of anastylosis implementation. Identification of monuments that can be subjected to anastylosis, necessity of determination of the quantity of original material that justifies the practice and the state of its preservation are investigated. The choice of new material, the reasoning for its use, and its differentiation from the original are surveyed. The use of connecting material and the preservation of the ancient structural system, as well as the employment of ancient or modern working tools and of new or traditional methods are challenged.

The subsequent section, entitled Charters, focuses on examination of the charters that set the theoretical framework and the principles overseeing the decided intervention. Questions also explore the interpretation of their principles, the possible delineation of extra principles, and any problems encountered during the intervention.

Management Issues are examined too. Procedures for approval of anastylosis decisions and their assessment are investigated and the co-operation of disciplines is determined. Finally, Looking Forward attempts to define whether the establishment of a methodology or an amendment to an existing conservation document is needed and, if so, whether it should comprise theoretical, philosophical or technical issues.

The questionnaire consists of forty-three questions. These questions are both purposeful – the respondent identifies the relationship between the intention of the question and the objectives of the survey – and complete – they express one entire thought (see Fink 1995, 13-14). Both open – when the respondents use their own words – and closed – when the answers are pre-selected for the respondents – types of questions are employed (De Vaus 2002, 99; Fink 1995, 15). Open questions were deemed useful because the intricacies of some issues were unknown, for getting unanticipated answers, and for describing topics from the point of view of the respondents. However, these were limited. Closed questions form the majority of the formulated questions, as the results lend themselves more readily to interpretation and some statistical analysis, even though the latter was not the exact intention of the researcher. In addition, because the respondents' expectations are more clearly spelled out in closed questions, the answers had a better chance of being more consistent. Nevertheless, each closed question provides an additional option which allowed more flexibility and the possibility of extracting quotable material (see Fink 1995, 15-16). Considerable attention is paid to the wording of the questions, so that they are clear and unambiguous (see De Vaus 2002, 97).

The choices given to respondents for their answers took two forms: nominal or categorical – which have no numerical or preferential values – and ordinal – in which respondents are asked to rate or order choices (see Fink 1995, 17). Additionally, an important principle in developing the question responses was to ensure that they are exhaustive, with the response alternatives providing a sufficient range of choices to cover all respondents (see De Vaus 2002, 101).

The questionnaire attempted to include multiple issues in a multilateral way and extract as much possible information regarding current practices and trends. Exploration of speculations and problems that arise was a crucial element. Therefore, the ability to suggest alternative options was provided. Emphasis was unequivocally placed on the acquisition of a variety of opinions without limiting options and with a view to compiling diverse ideas and practices.

b. General correspondence via letters, emails, and interviews

This survey tool gave the chance to professionals to focus on their own field of expertise. They were direct and thorough in revealing information, but were used only when flexibility existed. Their success was relatively limited, because of difficulties in meeting participants in various geographical locations and the reluctance of many professionals to be interviewed.

The interviews in person were constructed using the same consideration as the questionnaires (Newman and McNeil 1998, 27) and examined the same issues in a more compact and concise way (Appendix B2), with the added dynamic of interaction. Questions explored the meaning of anastylosis as a term and as a method, as well as in relation to restoration and reconstruction; the identification and assessment of driving forces; the structure of monuments in which anastylosis is applied; the amount and state of preservation of surviving material; issues related to completions and additions; the use of new or traditional methods, techniques, and tools; the professions that collaborate; respect for principles of reversibility and authenticity; respect for the values of the monument; assessment of international charters, particularly the *Venice Charter*; evaluation of anastylosis implementations; and what is/should be the way forward.

Correspondence with emails and letters was quite successful, since a great number of discussions took place. It gave flexibility to participants to express their views solely in their field of expertise. Such discussions proved extremely useful and stimulating. They offered a view and insight to paramount issues. They served the same role as the comments encouraged throughout the questionnaire and provided the researcher with the possibility of exploring further issues deriving from the denial or reluctance of professionals to participate in the survey

1.4.3.3 Criteria for selecting the participants of the survey

Setting criteria for inclusion and exclusion of participants in a survey is an efficient way of focusing the survey on only these people from whom the most accurate and relevant information can be acquired (Fink 1995, 29). As this survey aspired at confirming certain ideas and practices and extracting further information on anastylosis, exclusion criteria were dismissed and gravity was placed on inclusion ones. These related to the involvement of professionals in:

- anastylosis projects in sites around the Mediterranean region;
- international or national conservation and restoration institutes;
- archaeological institutions, organisations, committees, universities;
- heritage organisations and institutes.

Consequently, practitioners of anastylosis, involved in such projects as individuals or as members of relevant institutions, were contacted. Professions were as varied as possible amongst archaeologists, architects, architecture historians, civil engineers, geologists, conservators, and heritage managers. The represented organisations covered a wide range of university and research centres, as well as governmental and non-governmental institutions. This variety resulted in the acquisition of a diversity and plurality of ideas and opinions and the extensive coverage of issues.

1.4.3.4 Selection of participants

The procedure of contacting professionals was divided into different stages. In the beginning, attempts were made to communicate with specialists that have written or write about anastylosis and architectural restoration. This was in accordance to rules of purposive sampling – a form of non-probability sampling where cases are judged as typical of some category of cases of interest to the researcher. Although this does not necessarily ensure representativeness, it may provide useful information (see De Vaus 2002, 70 and 90; Newman and McNeil 1998, 49-50). Organisations were also approached to seek the contact details of anastylosis practitioners. The process abided by the snowball non-probability sampling in that it relied on previously identified members of a group to identify other members of the target population, particularly when such listings are not easily available or do not exist (see Fink 1995, 34).

Initially, it was possible to contact various international archaeological and restoration organisations and institutions and extract information on certain people, in terms of names, contact details, and specific interests. Often, contact with organisations depended on the willingness of those on the other side to share information by replying to requests for publications, information on procedures and lines of action, as well as on provision of contact details for individual professionals. Major national organisations and services in Greece, Italy, and Turkey were contacted in request of response to the questionnaire or any other information that could be disclosed. Unfortunately, this was ineffective. Many Greek regional services referred the researcher to the relevant Restoration Directorate, which had previously been unsuccessfully contacted. Other services could not provide any information due to the lack of anastylosis works in the region. From the Italian regional authorities there was only one response, while there was no response from the Turkish authorities.

Hence, the remaining option was to communicate with individuals working independently or as representatives of conservation and research institutions. Attempts were, comparatively, more fruitful. Many professionals responded, providing information on case studies, publications, contacts, and positive reception of the survey. Those who did not wish to take part in the survey explained their reasons why. Some did not manage to take part simply because of comparative difficulties in responding to the questions. In cases where it was possible to meet some professionals, conclusions regarding their reluctance to participate or discuss the whole subject matter and clarify their positions were reached.

1.4.3.5 How the results were used

To analyse the findings a variety of scholarly methods were utilised, such as descriptions, relationships, and comparisons (see Fink 1995, 53). However, no statistical analysis is offered, as mentioned in the beginning of the chapter, because the aim of the survey was to identify and explore the views and ideas of professionals rather than reach certain conclusions regarding the concept and practice of anastylosis. For this reason, not much emphasis was put on the use of tools (such as lists, charts and tables) to present the acquired data (see Fink 1995, 69). The analysis rather focused on the description and interpretation of the responses and the presentation of the quotable material.

Thus, the results deriving from the answered questionnaires were meticulously analysed. Answers were classified according to each question and were succeeded by their detailed presentation and analysis. Groups of questions were comparatively examined. Analysis of the interview answers was in accordance with the main issues identified in the questionnaire and was performed on the same grounds. The comments of the survey participants were reviewed in relation to each question that instigated them and in a wider context. Comments and observations of professionals, with whom correspondence was established, were integrated into them.

Hence, major aspects were explored and assessed:

- Determination of anastylosis as a concept and as a practice.
- Theoretical and philosophical issues, and the role of driving forces.
- Technical issues.
- Anastylosis and the international conservation charters.
- Procedures for anastylosis decision, planning, and implementation.
- Identification of the way forward and further suggestions.

Studying the answers attempted to identify and explore trends, if any, among countries, restoration schools, and organisations, as well as to establish patterns.

The presentation of the responses of the participants, acknowledging the ethical responsibilities – as stressed by most professional codes of ethics – towards survey participants: voluntary participation, informed consent, no harm, confidentiality, anonymity, and privacy (see De Vaus 2002, 59) – can be found in Chapter 6. It has the form of descriptive research that deals with questions of what things are like and not of why they are not that way (see De Vaus 2002, 18). Generally, the analysis and interpretation of the data of the survey was based on the defined objectives of the survey. All the data gathered and every question asked were specifically related to these objectives. In this regard, the descriptive nature of the research meant that the survey was designed and conducted to describe and discuss the answers of the respondents (see Newman and McNeil 1998, 55-56).

1.4.4 Survey among the visiting members of the public

Visitor surveys are an essential tool in tourism and leisure management, as they provide vital data on the activities and attitudes of users and non-users, in a cost-effective and efficient way. They are undertaken to meet several objectives, among which are to collect information on attitudes and opinions regarding the venue or location (Elwin 2001, 1-7 and 47). A type of visitor survey, in the form of a questionnaire, was employed in order to explore the views and opinions of the public visiting monuments subjected to anastylosis.

1.4.4.1 Objectives of the survey

This particular questionnaire is a so-called *visitor survey*. It was not undertaken as such, but rather to highlight the main issues emerging from anastylosis and their understanding by the visiting public. It attempted to touch upon matters related to heritage management and conservation and the involvement of the public in the decision-making and implementation process. It could not follow the rules of a visitor survey, because time was exceptionally limited. It was not employed as a major methodological tool, since its objectives can readily form the basis of another research. It aimed at providing some views of the public opinion and underlining their importance in a thorough approach to monument restoration.

1.4.4.2 Methodology of the survey

The places in which the survey took place were three different archaeological sites: Athenian Acropolis, Acropolis of Lindos at Rhodes – both in Greece – and Ephesus in Turkey. These sites were chosen as they already formed case studies of my thesis. Their selection was in accordance with the requirement of determining the location of the interviews, partly by the objectives and nature of the survey (Elwin 2001, 14-17). The conduct of the survey took place near the archaeological site or outside the area. Occasionally participants were selected at random with the requirement to have visited one of the sites within the last three months. Rules of approaching and sampling the public were not followed. The idea was to mainly highlight the needs of the visiting public, in terms of how they perceive restoration and the driving forces that influence its implementation, as well as whether they wish to be involved or not at any stage in the process.

The questionnaire (Appendix B3) consists of eighteen questions. Initially, the understanding of anastylosis by the public is examined. One section deals with the driving forces and how the public perceives their role. Another section explores the preferences of visitors and their assessment of anastylosis in terms of its reasons for implementation and the result. Finally, the issue of public involvement in decision-making and planning of conservation is explored. The last questions look at the demographic data deriving from those questioned.

1.4.4.3 Criteria and selection of survey participants

Surveys should make a basic decision about who the respondents should be and how they should be defined (e.g. users and non-users, visitors and locals) (Elwin 2001, 12-13). This survey did not aim at particular groups but addressed the visiting public in its entirety. It provided the demographic data of those questioned to illustrate who these visitors were, mainly local people, day visitors, and tourists, according to their classification in the visitor studies field (see Binks *et al.* 1988, 24).

1.4.4.4 How the results were used

The answers were analysed individually and in groups identifying the main issues, specifically the assessment of the understanding of conservation and anastylosis, the perceived influence of the driving forces, the public involvement and consultation in practices. The analysis offers an insight into the public view, and can enlighten professionals about the need of addressing the public in their approaches.

1.4.5 Analysis

The final stage of the methodological exploration of the results derived from questionnaire responses, interviews, informal discussions, and examination of case studies, as well as the investigation of anastylosis issues and the current theories and practices of site management and conservation through the literature review.

This led to classification of issues and analysis of problematic matters with regard to the decision-making, planning, implementation, and post-implementation of anastylosis, corresponding to its history and importance, its definition as a concept and as a practice, its reasons and objectives, its theory, the driving forces influencing its implementation, and the technical matters associated with the practice. Ideas and concepts were subject to cross-comparisons. The above-mentioned themes were drawn out and comparatively discussed. Their analysis, according to the specific objectives of the thesis, brought together all observations, as well as individual aspects that occasionally emerged in the case studies.

Thus, final conclusions were drawn. The outcome of this research was achieved by identifying problematic areas in anastylosis, highlighting adopted solutions and proposing ways for recognising their importance for successful undertakings and resolving them. These remarks accompany a series of delineated guidelines to be followed in anastylosis, specifically in Greece and Turkey, but with wider applications too. The guidelines attempt to create a framework for anastylosis-related issues, from decision-making aspects to planning, implementation, and post-implementation matters, particularly theoretical principles and technical matters.

1.5 Structure of thesis and outcomes

Anastylosis has been determined as a practice, in relation to the objectives it seeks to achieve and its being an intervention strategy of archaeological management and conservation. It has been defined with regard to the structure and geographical location of the monuments and its extent. The concept has been established from a theoretical and philosophical perspective. Technical aspects have been scrutinised while the decision-making process has been identified and assessed. Problems encountered have been explored. Special reference has been made with regard to monuments subjected to anastylosis, though they had been restored in the past.

This research was conducted in a relatively small-scale manner so as to identify these issues, to assist and encourage the practitioners in adopting a meticulous, yet individual interventive approach to specific monuments, and to advance further research on this widely used and historically significant concept and method.

The thesis is structured as follows:

Chapter 1: Introduction. It provides the reasoning for deciding upon the specific topic and the methodology of researching anastylosis.

Chapter 2: The context of cultural heritage management. It places the debate on anastylosis into the wider framework of site management and conservation.

Chapter 3: Anastylosis: current issues. It analytically presents the issues and debates on anastylosis.

Chapter 4: Case studies from Greece. Anastylosis projects in Greece are examined.

Chapter 5: Case studies from Turkey. Anastylosis projects in Turkey are examined.

Chapter 6: Professional and Visitor Surveys. The results of both the professional and the visitor surveys are presented.

Chapter 7: Discussion of the issues raised from the concept and practice of anastylosis. The concept and practice of anastylosis is discussed, according to the specific objectives of the thesis.

Chapter 8: A methodological approach to anastylosis, including its redefinition and guidelines for its implementation. The redefinition of anastylosis is presented, together with proposals for a methodological approach to anastylosis with the relevant guidelines.

Chapter 9: Critical evaluation and concluding remarks. They include a critical evaluation of the undertaken research, proposals for further research, and the underlining of the significance of this research for anastylosis.

Appendices. They incorporate: photographic material acquired during the visits to the case studies; the employed survey instruments; references on anastylosis within the international conservation framework; the history and the anastylosis programs of the monuments selected as case studies; a glossary of architectural terminology; information on the survey participants; and the extended version of the produced recommendations for planning and implementing anastylosis.

CHAPTER 2: THE CONTEXT OF CULTURAL HERITAGE MANAGEMENT

2.1 Background

The modern concepts of heritage protection and conservation derive from the historical consciousness that developed in Europe in the 18th century (Jokilehto 1996, 56). They were systematised in the 19th century, when 'European nations identified themselves with their material heritage' (Lowenthal 1985, 385).

In the 20th century conservation was considered as another way of looking at art and cultural heritage (Melucco Vaccaro 1996a, 202-204). Intensive architectural conservation after the Second World War, because of the fear that people would lose their identities by losing their heritage (Gazzola 1972, 30; Melucco Vaccaro 1996a, 205), indicates the impact of identity. Additionally, recognition of the rights of the community was first introduced by the *Athens Charter* (ICOMOS 1931), while the need to apply conservation and restoration within the framework of individual cultures and traditions is acknowledged in the *Venice Charter* (ICOMOS 1964).

Recognition of cultural adversity and of preserving the values of living communities led to re-assessing the meaning of heritage and the policies for its protection (Jokilehto 1999, 18; Philippot 1996a, 218-219). Conservation further evolved from dealing with 'historic and artistic work of the past', to include 'more modest works', and recognised European heritage as 'the common heritage of all her peoples' (Gazzola 1972, 30; Jokilehto 1999, 290).

Earlier romantic approaches to restoration gave way to scientific approaches and coherent philosophies, developed in Europe, but applied worldwide (Stanley Price 2003, 285). Conservation was defined as specialisation and independent field of study and was included in the activities of national and international organisations (Melucco Vaccaro 1996a, 204-205; Philippot 1996a, 216-217; Pye 2001, 49).

These organisations developed awareness of heritage and promoted collaboration for its protection and safeguarding. Such were the United Nations Educational, Scientific and Cultural Organisation (1945), the International Centre for the Study of Preservation and Restoration of Cultural Property (1956), the International Council of Monuments and Sites (1965), and many more. They formed conventions with legal force for the signatory countries and recommendations or charters as guidelines on practical actions, defining conservation standards and setting codes of ethics for heritage protection (Bell 1997, 1; Frin 1966, 83; Jokilehto 1996, 57-66).

Conservation principles established in these documents derive from the thought of restoration theoreticians who contributed to the development and advance of restoration theory. For instance, Gustavo Giovanoni's theories influenced the delineation of the *Athens Charter* (Erder 1986, 101-102; Jokilehto 1999, 219-222).

Modern conservation principles refer to art and history as criteria for selecting monuments for preservation (Silva 1983, 10-11). Cesare Brandi was a pioneer in emphasising the historical and artistic-aesthetic dimension of restoration of art and architecture (Jokilehto 1999, 228; Philippot 1996a, 217). His definition of restoration entailed that restoration 'forms the methodological moment of the recognition of the work of art in its physical durability' (Brandi 1963) and that it should follow historical principles (not to destroy traces of the passage of time and human intervention) and aesthetic ones (to remove erroneous completions and inappropriate alterations) (Cordaro 1994, 15-17; Jokilehto 1999, 224-233; Melucco Vaccaro 1996a, 207-209). He aimed at a systematic philosophical outlining of restoration, which consists of a general theory and specific principles. He also illustrated the critical process required by modern restoration. His phrasing of the restoration theory was influential for the development of conservation policies at international level, being a reference when writing the *Venice Charter*, and is until now dominant in training programs and in delineating conservation policy statements and guidelines (Jokilehto 1996, 67; 1999, 237; Karadedos 1984, 52).

The 20th century conservation attitudes emerged as a reaction to excessive interventions and encouraged more appropriate approaches to preserving monuments. These included concepts of preventive care, limited and visible interventions, reversible treatments, and compatible materials (Pye 2001, 51; Stanley Price 2003, 285). Ideas were further developed with time and with experience gained from practices, particularly the principle of minimum intervention. The most general principles are now: recording and research before intervention; minimum alteration of fabric; minimal risk of damage or uncertainty in intervention and selection of materials; reversibility of intervention; retention of maximum of the original structure; distinguishable use of new material; respect for the setting; preference for original materials and workmanship; and longevity of work (Warren 1996, 39-48).

Others were further enhanced. For instance, the respect for the values of monuments initiated from historic and artistic ones, as endorsed by the *Athens* and the *Venice Charters* and Camilo Boito (see Gazzola 1972, 30), and was analytically classified by Alois Riegl (Jokilehto 1999, 216-217). It reached the point of recognising multiple values attributed to heritage by those who value it (*Burra Charter*). Additionally, conservation and preservation of the setting, initially established in the second half of the 20th century (Frin 1966, 97), is nowadays undertaken.

Currently, preservation and presentation of ancient monuments form part of the wider process of heritage management, from which important problems derive. Various degrees of intervention are employed, aiming at structural protection and conservation and being interwoven with issues of interpretation, education, identities, and tourism. Restoration theories have developed, accompanied by technological experimentation. Debates question motives and practices, as 'the propriety of restoration generates passionate dispute' (Lowenthal 1985, 278-282). Attitudes to what is acceptable in heritage management and conservation have radically changed and are still changing. Thus, the development of anastylosis and its applications have developed within different contexts, but need to be re-assessed in the light of the current issues and debates in the field.

2.2 Heritage Management and Conservation

Conservation has now obtained an officially recognised position in many countries. As heritage is tangible evidence of the past and the basis of the modern world, it is acknowledged that critical approaches for conservation are needed. Principles and theories are challenged, terminology should correspond to the needs of the multidisciplinary field and technology should be used wisely (Jokilehto 1985, 11).

The treatment and care of cultural resources raise many questions, so it is important to intervene carefully. Therefore, the rule of thumb for many conservators maintains that it is 'better to preserve than restore and better to restore than reconstruct' (McManamon and Hatton 2000, 16). Hence, discreet interventions are favoured.

Besides, new concerns have emerged, as scientific environmental surveys show that aggravated damages are owed to excess of visitors. Causes of damage are not easily eliminated and elimination may not be within the province of conservation authorities. However, no theory is effective if it does not consider sustainable uses and the environmental quality (Melucco Vaccaro 1996a, 204-206). Thus, heritage management includes environmental sustainability (Jokilehto 1999, 292).

Hall and McArthur (1998, 3-5) summarise the points that management should address, particularly the ownership and development of heritage; its conservation and the reasons behind it; the needs of visitors and communities, the identification of management goals and the appropriate means for achieving them. In this regard heritage management recently changed focus: from conserving the resource to finding an appropriate balance between visitors in the 1980's and paying attention and understanding the human dimension of heritage, and to recognising that there are multiple meanings attached to heritage by the 1990's. Hence, planning is now considered essential. Although, as Sullivan (1997, 16) reveals, managers may object to formal planning, unplanned approaches lead to decisions that have negative consequences in the short and long term.

Thus, fundamental aspect becomes the conduct of management and conservation plans. As Aplin (2002, 75-76) specifies, conservation plans are involved with the recognition of heritage sites and the active aspects of conservation, while management plans are concerned with maintenance and preservation of values and include aspects of finances, marketing, visitor management, as well as strategies.

The *Charter for the Protection and Management of the Archaeological Heritage* (ICOMOS 1990) confirms that the aim of management should be the preservation of monuments *in situ* and sites, as well as their long-term and conservation and curation. The charter endorses integrated policies relating to land use, development and planning, as well as cultural, environmental, and educational ones. It stresses the importance of effective collaboration between professionals from many disciplines and the participation of the general public.

Physical interventions (stabilisation, anastylosis, restoration, reconstruction, and so on) should be central in the management policy for the site. In this regard, it is endorsed that 'any intervention must be consistent with the significance of the place and its management policy' (Sullivan 1997, 24). Consequently, all intervention methods become part of heritage policies and are interrelated with the efforts to enhance the significance and ensure preservation of the site. Thus, anastylosis will be examined within the framework of heritage management and decision-making.

The systematic development of a theory and methodology of intervention and an empirical perspective can establish its extent and nature. It only becomes problematic when moving from theoretical premises to practical intervention. This is why Carbonara (1996, 237) maintains the need for transforming the theoretical framework into 'practical principles that cannot be considered empirical', exactly as Brandi (1963) had confirmed. Although codes of practice and guidelines, with increasing degrees of specialisation, are widespread, it is doubtful whether there is need for new ones or not. It is considered helpful if countries and cultures adopted a procedure whereby conservation decisions would be taken on a widely accepted ethical basis (Brimblecomble *et al.* 1997, 390; Burman 1997, 285).

2.3 Current Issues and Debates in Archaeological Conservation and Management

2.3.1 Kinds of intervention: terminology and meanings

There is a certain variety according to the degree, extent, and manner of the kind of physical intervention to archaeological heritage, while differences appear between national terminologies and different contexts.

Conservation is generally understood as a multidisciplinary activity (Jokilehto 1996, 66-67). It forms an integral part of heritage management, as the covering concept for combinations of different interventions, according to most charters. Conservation activities prevent and/or rectify deterioration effects, balancing the needs for heritage access and use with long-term preservation (Coremans in Berducou 1996, 253; Feilden 1994, 3; Pye 2001, 24).

Restoration is considered the form of treatments applied to monuments to return them to a known earlier state (Coremans in Berducou 1996, 253; ICOMOS New Zealand 1992). It enhances their aesthetic and historic values (ICOMOS 1964).

Conservation and *restoration* are presented as alternative choices and differentiation of their objectives is acknowledged (Berducou 1996, 253; de Guichen 1999, 4; Pye 2001, 29). *Conservation* aims at minimisation of deterioration and *restoration* should facilitate interpretation (Feilden 1994, 9; Pye 2001, 29). National and international associations distribute individual interpretations, which may differ from country to country and even within countries (Berducou 1996, 253; de Guichen 1999, 4). In Italy, the concept of *restoration* describes conservative treatments, while in English the term has been replaced by *conservation* (Berducou 1996, 254; Jokilehto 1996, 67). In other European languages and contexts, *restoration* covers both the activities of *restoration* and *conservation* (Pye 2001, 26).

Reconstruction is determined as partial or full-scale rebuilding of a monument. It should be based on archaeology, archival research, or physical evidence (Jameson and Hunt 1999, 35), prerequisites established in the charters. On the other hand, *anastylosis* – meaning re-assembly of the dispersed members of structures – was introduced in the *Athens Charter* and was endorsed, by the *Venice Charter*, as an acceptable form of architectural conservation with wide applications. In Greece and Italy, it also implies *restoration*.

Other interventions, considered as conservation processes, according to the *New Zealand* and the *Burra Charters*, include *preservation*, which means maintenance of the fabric in its existing state and delaying deterioration; *repair*; *maintenance*, meaning the continuous protective care of the fabric and setting of a place;

stabilisation, which protects a monument from decay; *adaptation*, also know as *rehabilitation*, which means modifying a place to suit the existing use or a proposed use (Australia ICOMOS 1999; ICOMOS New Zealand 1992). Further options include *consolidation*, implemented to ensure the continued durability or structural integrity of monuments; *preventive/indirect conservation*, related to controlling the environment of cultural properties by preventing decay and damage; and *reproduction*, which entails copying an artefact in order to replace missing or decayed parts (Feilden 1994, 9-11).

It appears that no strict boundaries are found between the different interventions to monuments, as overlapping areas are noticed. However, primary objective of each treatment is, ideally, the contribution to understanding and safeguarding heritage.

2.3.2 The appropriate scale of intervention

Debates on the appropriate scale of intervention are endless. In restoration, anastylosis and reconstruction, additions with new materials are utilised, but no references regarding their extent are made in the charters. Common aim is full or partial re-instatement of the form of the monument, as nearly as possible in restoration and anastylosis, and as exactly as achievable in reconstruction.

Thus, the extent and location of new work should be well thought-out. Feilden and Jokilehto (1999, 65) suggest consideration of its objectives. It is also acknowledged that the historical character and scientific data of monuments should be safeguarded, by respecting their nature and securing lifelong preservation (Feilden and Jokilehto 1998, 65; Schmidt 1997, 50). This is why policies of minimum intervention, ascertained by minimum alteration, minimal risk of loss or damage of fabric, and retention of maximum of the original structure (Warren 1996, 39) have prevailed.

Minimum intervention was introduced as a concept in the beginning of the 20th century and the *Madrid Conference* (Demas 1997b, 151) while, at that time, Alois Riegl approved minimum intervention and limited restorations (Jokilehto 1999, 218-219). Brandi endorsed minimum intervention and systematised the concept of reversibility (Brandi 1963; Cordaro 1994, 20-23; Melucco Vaccaro 1996a, 207). He formulated three principles, which have influenced the articulation of relevant principles in the *Venice Charter*. Accordingly, re-integrations, not offending the unity that is restored, should be easily recognised; the part of the material that directly results in the images, so far as it forms the aspect and not the structure, is irreplaceable; restoration should be undertaken in a way that it will not impede future interventions, but rather facilitate them (Brandi in Jokilehto 1999, 236).

Thus, the concept of reversibility was introduced to warrant towards re-establishment of the previous condition of a monument (Petzet 1995, 94). It ensures that actions can be reversed and that future access to evidence incorporated in the building is possible (Feilden and Jokilehto 1998, 59).

However, as Oddy (1999, 4-5) underlines, in the past, reversibility was taken to mean that any material added to an object should be easily removable, yet now it includes all conservation processes applied to antiquities. Eventually, it was realized that reversibility constitutes a guiding principle that is neither absolute nor attainable (Munoz-Vinas 2005, 186; Oddy 1999, 5; Palazzi 1999, 175; Schniewind 1987, 107-108; Seeley 1999, 161). According to the discussion on the concept, various ideas have been projected. Smith (1999, 99-100) and Appelbaum (1987, 65 and 71) suggest that professional judgement and proper consideration should substitute the philosophy of reversibility, since the term itself is attributed different meanings by various conservators. Thus, a more precise definition should be developed and established (Smith 1999, 103). Other suggestions focus on examining the idea of reversibility in relation to all parts of a treatment, to the many kinds of objects, and to the wide variety of treatment techniques (Appelbaum 1987, 65-66).

Additionally, the experience that reversibility is not always achieved has led to the development of alternative notions, such as removability – acknowledging that a material may have an effect upon the object it is contact with, which is not likely to disappear even after the material is removed – and retreatability – which only requires that a give treatment does not make future treatments impossible (Munoz-Vinas 2005, 187).

Despite all the above, it is acknowledged by many professionals that the advantages of the notion, if the notion is not perceived as absolute, can outweigh the disadvantages (see Smith 1999, 101-102; Munoz-Vinas 2005, 185-188).

2.3.3 The role of preventive conservation

Preventive conservation is not a new idea, being employed since the Greek and Roman antiquity. With the development of professional restoration in the 19th century, interventive methods became common (Koller 1994, 1-7). Preventive conservation re-appeared to respond to drastic changes in environment and heritage and reduce deterioration risks (de Guichen 1999, 4; Kissel 1999, 33). Lately, it gained ground as it frequently forestalls the need for major interventions and reduces conservation costs (Feilden and Jokilehto 1998, 64; La Rocca and Nardi 1994, 24). It is enacted through condition surveys; environmental monitoring and control; disaster plans; storage, display and handling policies; and testing of materials (Caple 1994, 65). In conclusion, employing preventive conservation is a way of planning ahead by eliminating damaging factors and avoiding extensive interventions.

2.3.4 Collaboration of disciplines and instigation of new technologies and training in conservation

In the 20th century, conservation became closely connected with scientific approaches. Argan and Brandi underlined the need for a unified scientific basis of restoration (Jokilehto 1999, 223-225). The *Athens Charter* emphasised the collaboration of architects and scientists, while the *Carta del Restauro Italiana* (1932) endorsed conservation as interdisciplinary science (Burman 1997, 279-281). However, it is sustained that nowadays interdisciplinary approaches are seldom put into practice (Torraca 1996, 442).

Despite the above, modern technology is endorsed because it has the potential to obtain knowledge on the behaviour and condition of structures and materials. Methods and products that allow consolidation, preservation, and recovery of damaged structures (Jokilehto 1999, 299-300; Sanpaolesi 1972a, 49), as well as replacement of ancient elements by durable materials (Frin 1966, 92) are developed.

Yet, efforts are made to limit the injudicious usage of modern technology, especially through the *Venice Charter* (Silva 1983, 10-11). New technologies are thought to not replace a working knowledge of traditional crafts and materials (Linstrum 1996, 116). Thus, a tendency towards traditional workmanship is frequently noted in restoration projects worldwide. Feilden (1994, 12-18) maintains that good workmanship is achieved by proper training, continuity of work, and respect for the status of craftsmen, while experts should respect each other's contribution and form a team. According to Camuffo (1997, 65) such co-operation can bring a global view to conservation problems and allow amalgamation of different viewpoints.

Ideas about training in conservation emerged through the *Sixth International Congress of Architects* in Madrid (Demas 1997b, 151; Jokilehto 1996, 55-56).The importance of specialised training and the multidisciplinary nature of conservation are prioritised in the charters, yet, training developed quite late. Courses and initiatives originate in the mid-20th century. ICOMOS established an International Training Committee, which has endorsed *Guidelines on Education and Training in the Conservation of Monuments, Ensembles and Sites,* while ICCROM has been organising courses in heritage conservation since 1962 (Jokilehto 1999, 289).

Nowadays, development of formal conservation training includes academic education, balance of science and humanities training, training in practical skills, diagnosis and problem solving, and definition of conservation and restoration (Pye 2001, 166-182). The Working Group on Training in Conservation and Restoration of ICOM endorses training of other disciplines in basic conservation principles (Stanley Price 1989, 292-301).

2.3.5 The concept of authenticity and emerging issues

Authenticity and integrity were initially thought to indicate originality and material completeness, but now comprise abstract attributes too (Pye 2001, 58). Integrity refers to material wholeness, completeness, or entirety. In sites, it refers to elements that make up an *organic* whole (Jokilehto 1999, 298-299). Notably in the East – Asia, including China, India, Japan, and surrounding regions – priority is given to preserving function and significance rather than material remains. In the West – Western and Central Europe, including countries whose identity and culture derived from European culture – efforts are made to preserve the ruin just as it is. Both conceptions are considered plausible, neither is 'right' (Price 2000, 213-215; Wei and Aass 1989, 5). Interestingly, these diverse approaches are attributed to differing philosophical approaches to the world. As Wei and Aass (1989, 8) argue, in the West, Greek philosophers developed a concept about the identification, analysis, and classification of objects. In this context, architectural heritage underlines historical legibility. Yet, the Chinese traditional philosophies emphasised communication of deeper meanings by individual objects. Hence, continuous repairs or rebuilding may change the physical form, but the spirit of the original is preserved as continuity.

Nishimura (1995, 175 and 183) explains that the perception of authenticity is not static in Asian countries, as they have witnessed rapid economic and cultural changes and their perception of cultural properties is different from Europe. Besides, in Japan, restoration needs derive from its geographic conditions and the humid, high-temperature climate (bio-deterioration, typhoons, earthquakes) (Larsen and Ito 1990, 18). Thus, wooden buildings – wood is a popular building material in Asia – require frequent maintenance and repair with partial dismantling, which is facilitated by the particular construction system. Yet, with Buddhism, keeping the original material was endorsed and, soon, new attitudes, similar to European ones, were introduced (Larsen 1988, 15-16; Larsen and Ito 1990, 17-18).

Related to authenticity is the concept of *dead and living monuments*, introduced by the *Sixth International Congress of Architects* (1904) in Madrid (Demas 1997b, 151; Jokilehto 1996, 55-56; Locke 1904, 344). *Dead monuments* belong to a past civilisation and, hence, their preservation should prevent their natural decay. *Living monuments* continue to serve the purposes for which they were originally intended and they should be restored so that they continue to be of use.

However, problems emerge in their preservation and in assessing their authenticity. Difficulties in reaching a compromise between people still using monuments and conservation conditions surface (Inaba 1995, 330-331). In this view, Indonesians acknowledge that authenticity can be respected multilaterally when restoring *living* heritage (Samidi 1995, 389). The concept was initially related with ruined monuments brought to light by archaeological excavations (Erder 1995, 29). It has now been abandoned in the western context, though, up to a point, it efficiently directed conservation approaches. It has probably been forsaken due to the nature of such definitions – too absolute as far as *dead monuments* are concerned and too abstract regarding *living monuments* – and the subsequent difficulties in classifying monuments as either.

In the 20th century the concept of authenticity re-emerged. Until then, as Petzet (1995, 92) confirms, preservation concentrated entirely on the historic fabric. The *Venice Charter* stressed the importance of authenticity, without determining the notion. But, recent considerations questioned the belief that only the original fabric has a particular power. In nominating sites to the World Heritage List, according to the *World Heritage Convention* (UNESCO 1972b), authenticity covers the aesthetic and historical aspects of sites, and their physical and social context (Jokilehto 1999, 298). References for authenticity assessment were introduced in the *Nara Document on Authenticity*, such as 'form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling'. However, it is stressed that authenticity should be appreciated as relative to the identification of values, 'judged within the cultural context to which they belong' (ICOMOS 1994).

The Nara meeting did not definitely resolve authenticity but it acknowledged that in order to establish a univocal meaning of the concept, it should be disconnected from its original meaning and history in the Western culture (Choay 1995, 297; McBryde 1997, 97). As Lowenthal notes 'against a popular perception of authenticity as fixed and unchanging, its actual flux of change needs to be systematically outlined and sympathetically assessed' (1995, 134). Repeated renewal is the only guarantee for survival of certain cultures (Petzet 1995, 94) and it is not seen as affecting significance. For instance, the wooden Japanese temples or the earthen African buildings need regular renewal to stop decay and disintegration (Pye 2001, 66).

Respect for authenticity becomes a principal aim of conservation. Nowadays, authenticity attaches to faithfulness to original objects and materials, contexts, or aims, which is considered ultimately unattainable (Lowenthal 1992, 186). Lately, a preference for original materials and workmanship is advocated, as it is regarded 'to preserve the appearance and historic integrity of buildings and ensure the work has an appropriate life' (Drury 1994, 200).

Modern aesthetics are frequently discussed with regard to authenticity (Feilden 1994, 12). It should be taken into consideration, though, that the criteria, by which authenticity and aesthetics are judged and valued, change over time, from place to place, and from culture to culture. Additionally, the signs of ageing and wear should be consciously respected. Patina is highly esteemed as part of the identity of the object and its significance lies in being a symbol of age and genuineness (Van De Wetering 1996, 419). Cleaning processes should not destroy it and it should not be produced artificially (Feilden 1994, 21).

2.3.6 Reconstruction *in situ* or off site

The *Charter for the Protection and Management of Archaeological Heritage* declares that 'reconstructions should not be built immediately on archaeological remains' (ICOMOS 1990). The reason is the damage of archaeological resources by extensive interventions and the visitor impact (Blockley 1999, 17). Contrastingly, reconstruction *in situ* is favoured for placing buildings in their original setting and highlighting the sense of place, while safeguarding the aesthetic integrity of monuments and reinforcing national and cultural identities of peoples (Lowenthal 1985, 286-288; Schadla-Hall 1999, 105). Context is regarded influential in establishing and enhancing significance and authenticity too (Pye 2001, 72-73).

2.3.7 Reasons for intervention: interpretation, education, tourism, identities, public

Interpretation and education, experiment and research, tourism development, local and cultural identities explain the increasing number of interventions in monuments. They are interwoven, achieving similar objectives and, often, being misused in similar ways.

Interpretation is interrelated with the need for preservation and the necessity to make visitor experiences meaningful (Sivan 1997, 51-52). Education, connected with the improvement of legibility and interpretation, becomes fundamental in heritage conservation and presentation, due to the emphasis on making the past interesting and accessible (Bower 1995, 34-38). Ideally, improvement of legibility aids interpretation, which in turn facilitates education for both visitors and experts.

Interpretation and education represent long-term investments, as they improve the quality of visitor experiences, create greater sense of place and ownership of heritage for communities, and raise awareness and understanding of heritage values for managers (Hall and McArthur 1998, 168; Timothy and Boyd 2003, 204). This is interestingly reflected in Tilden's dictum: 'through interpretation, understanding; through understanding, appreciation; through appreciation, protection' (in Uzzell 1998, 12).

In this regard, reconstruction is preferred for fulfilling interpretation and education objectives, as it transforms ruins into comprehensible structures, when is carefully planned and does not damage archaeological resources (Jameson and Hunt 1999, 60; Schmidt 1999, 65). However, interpretation does not always correctly enhance heritage awareness, understanding, and appreciation (Uzzell 1998, 11). The greatest debate is based on the existence of 'the thinnest of dividing lines between effective interpretation and the creation of *archaeological Disneylands*' (Cleere 1989, 14). Certainly, in an effort to achieve interpretation for the public, heritage experts occasionally overdo it. Interventions often result in transforming the character of the site and its monuments. Instead of enhancing interpretation, the site is converted into a theme park where objectivity may lack and the ultimate aim develops into the entertainment, rather than education, of visitors.

This is the reason why interest in the objectivity of interpretation questions the responsibility of archaeologists towards archaeology and the public (Stanley-Price 2003, 284). As Sivan maintains (1997, 52), political struggles, cultural fashions, technological skills, artistic expressions, religious beliefs, and other aspects of human behaviour should be brought forth by interpretation. As the existence of different interpretations of the past is acknowledged (Pye 2001, 11), archaeologists and historians, interpreters and educators should co-ordinate their work and communicate these different interpretations to the public (Kuttruff 2003, 278; Stone and Planel 1999, 2). Thus, interpretation aims should be clearly established, regularly reviewed, and combined with changing and varied presentations (Feilden and Jokilehto 1998, 100; Kuttruff 2003, 278). These prerequisites are acknowledged as essential by heritage specialists. However, in practice, there is still a long way to go, as other factors may influence decisions, for instance issues of political legitimisation and tourism. A significant example of progress in this regard has been made by ICOMOS, which has drafted the *ENAME Charter for the Interpretation of Cultural Heritage Sites* (2005). Its aim is 'to define the basic objectives and principles of site interpretation in relation to authenticity, intellectual integrity, social responsibility, and respect for cultural significance and context' (ICOMOS 2005).

On the other hand, in experimental archaeology, reconstruction is employed to test archaeological theories (Schmidt 1997, 47). Use of experimental archaeology for researching, understanding, and presenting the past, as well as for educating the public, is regarded 'an effective interpretation approach and an important aspect of educational site visits' (Killebrew and Lehmann 1999, 5-6; Stone and Planel 1999, 7). Models are constructed, based on surviving evidence, and they are tested in multiple ways, placing greater reliability upon them. The values of experimental structures are education and their public appeal, which, in turn, bring appreciation and support for further work (Coles 1979, 33-36). Such an example is provided by the Lemba Experimental Village in Cyprus, which incorporates a full-scale construction of a Chalcolithic village next to its actual remains, with the final goal of testing and defining aspects of prehistoric construction and processes of site formation (Gordon 1999, 110-120).

Hence, interpretation, education, and improvement of legibility are all interrelated and interdependent. Their influence on interventions is acknowledged by most heritage experts. However, in practice, this influence can be immense, contradicting the latest restoration theories and trends of minimum intervention.

National and cultural identities are major driving forces in interventions. As Byrne (1991, 275) confirms, archaeological heritage helps to develop the awareness of the population of a shared historical identity, either in geographical or cultural terms. Political legitimisation has been the case in many sites, because 'politics and ideologies are closely interwoven with interpretation' (Killebrew and Lehmann 1999, 4). In this way, national, local and cultural identities are *invented* or strengthened.

For example, the reconstruction of the Minoan palace in Knossos in Crete is a source of national (Greek) and local (Cretan) pride (Papadopoulos 1997, 99).

However, the issue of identity is often abused to serve political or other goals. Preservation and presentation of the Great Zimbabwe monument reflect biases, as its interpretation addresses foreign visitors only. The nationalistic politics of the 1960's and 1970's saw the site as a political symbol and changed the name of the country after the site, becoming the only country in the world named after an ancient monument (Ndoro 1994, 621). Deliberate reconstructions have happened frequently. In reconstructing ancient Babylon in Iraq, only the ruler power, rather than the qualities of learning and wisdom of the ancient Mesopotamian civilization, has intentionally been displayed (Blockley 1999, 18). As Jokilehto observes, 'the concept of national monuments is often loaded with political values which can provoke reconstruction of desired features of monuments and elimination or destruction of others contrary to political goals' (1999, 308). Besides, in multi-cultural societies it is common for the dominant group to project its own heritage (Byrne 1991, 275). For instance, Qasrin, a Byzantine-period Jewish village in the Golan Heights was excavated in the 1970's-1980's to demonstrate the ancient Jewish presence in the area (Killebrew and Lehnmann 1999, 2).

Hence, identities are quite dominant in heritage management and conservation decisions. Although the importance of a shared identity for a community should be acknowledged and respected by professionals, the issue seems to be a sensitive one, as it can be easily abused for nationalistic and political reasons. Consequently, it is essential to underline that objective consideration of the aims of interventions should precede any decision.

The economic potential of natural and cultural sites is often realised through tourism (de la Torre and Mac Lean 1997, 10-11). Cultural tourism and economic development provide jobs, modernisation, and opportunities to learn about history and archaeology. Often, preservation and development depend on the ability of the site to attract the public and generate funds (Killebrew and Lehmann 1999, 4; McNulty 1985, 34-36).

However, archaeological ruins are frequently subject to the conflicting demands of conservation and tourism, while lack of communication between the tourism industry and the heritage sector complicates decisions (de la Torre and Mac Lean 1997, 10-11; Timothy and Boyd 2003, 133). This destructive potential of tourism originates from demands for leisure entertainment (Herrmann 1989, 31). As Fowler indicates, there is a fine line between informing people and 'aggressively marketing heritage attractions' (1992, 122). Moreover, unrestricted tourist activity damages the archaeological record and inhibits the heritage experience (Hall and McArthur 1998, 87; Herrmann 1989, 31). This is frequently noted in the Mediterranean. In Knossos, Crete, the arrival of large groups of visitors has placed pressure on the original fabric of the monument (Papadopoulos 1997, 113). So, on the one side is the intent to popularise a site (Killebrew and Lehmann 1999, 4) and, on the other, the danger of the erosion of the resource (Blockley 1999, 18).

To keep a balance is difficult but, as Herrmann underlines, heritage managers can safeguard archaeological sites and avoid 'extensive reconstructions and sensational presentations' (1989, 31). Compromise must be reached between the conflicting objectives of preservation and use, as well as between maintaining the integrity and aesthetic appeal of heritage whilst encouraging visitors and making profits (Carter and Grimwade 1996, 45-46; Johnson 1985, 13; Shackley 1999, 70). This is the aim of the *Charter on Cultural Tourism* (ICOMOS 1999), which recognises the dynamic interaction between tourism and cultural heritage. It outlines basic principles to be followed by heritage management and by the tourist industry, so as to communicate the significance of heritage and the need for its conservation to the host community and the visitors.

The issues discussed above strongly influence conservation and management decisions, being closely linked with each other. For example, education and interpretation are addressed to the public, hence both local people and tourists. Concerning locals, the compelling influence of identities becomes crucial. These aspects also affect the nature and extent of the undertaken interventions. Although they are acknowledged by professionals as influential, there does not seem to be much insight into the actual role of these issues and the degree to which they influence or govern decisions.

2.3.8 Indigenous peoples and world heritage

Herrmann (1989, 30) confirms that archaeological research and site management problems vary between world regions, and between eras in cultural history. A major aspect of management has become the heritage ownership, which is acknowledged to have moral, cultural, legal and material dimensions (Creamer 2003, 137; Hall and McArthur 1998, 41-42). Heritage authorities are increasingly concerned with ways of expanding concepts and practices for accommodating the heritage of multicultural societies (Pearson and Sullivan 1999, 312).

Consequently, much weight is now placed on indigenous peoples and their heritage, particularly how this heritage can be preserved and managed. Previously, neglect of indigenous peoples dominated practices. Their voices about heritage protection are only recently heard, as their movements have strengthened in Australia, Canada, New Zealand, and the United States. This led to an interest for ensuring that cultural heritage is controlled by those whose heritage it is (Hall and McArthur 1998, 41-42). Still, much needs to be done, because, as Creamer (2003, 130) confirms, Aboriginals' views are seldom induced in site management.

In the effort to comprehend the vital differences between indigenous and western approaches to heritage management and conservation, Byrne notices 'a lack of fit' (1991, 273), while Kreps (2003, 8) upholds that western models and practices are ineffective in non-western cultural contexts. An integrated approach in co-operating with ethnic communities, recognising the heritage of different cultural groups, and assisting them to celebrate it is sought (Pearson and Sullivan 1999, 313). These realisations are a significant step forward, but understanding indigenous perceptions and systematic efforts within management are required so as to safeguard aboriginal heritage effectively and in accordance with their ideas of protection and preservation.

The *Athens Charter* initially introduced the idea of a common world heritage (Demas 1997b, 151). Nowadays, changes in the meaning of *universal* reflect the notion that each product is a creative and unique expression of a particular artist or community, and represents the relevant cultural context (Jokilehto 1999, 295). They also reveal the idea that all people share an interest in heritage, in both national and international levels (Byrne 1991, 273-274). These ideas of universal significance of heritage have developed since the *World Heritage Convention for Protection of the World Cultural and Natural Heritage* (UNESCO 1972b). The convention is concerned with identification, protection, conservation, and presentation of the natural and cultural heritage of the world that is of *outstanding universal value*, while being interpreted as genuine contribution of the culture it represents. It, thus, entails development of universal policies for protection of past achievements (Byrne 1991, 273-274; Drost 1996, 480; Jokilehto 1996, 55-56; Wheatley 1997, 4). Inscription of monuments on the World Heritage List ensures international recognition and provides international and national support and funding (Federspiel 1999, 166-171; Wheatley 1997, 5).

Therefore, ideas of universal value and policies in safeguarding world heritage have developed. Yet, there is still a long way to go before implementing integrated policies that respect the differences of cultures and facilitate nations which have difficulties in providing for their heritage. Concerns regard the imperialistic aspects of the world heritage concept and an emergent universal heritage deriving mainly from the West (Byrne 1991, 274-276), reflected in the geographical and thematic disproportions of the List (ICOMOS 1997).

2.3.9 Ideas about sense of place and identities and their impact on conservation and restoration programs

The concept of heritage has been further expanded from 'historic building and its environment' to 'historic site', and from 'monument' to 'cultural property' (Erder 1986, 191). Heritage does not only incorporate the 'representative', the 'best', the 'ordinary', the 'monumental' (Stovel 1995, xxiv), while the *Burra Charter* (Australia ICOMOS 1999) endorsed the concept of 'place', instead of 'monument' or 'site'.

In this regard, conservation and restoration are now directed towards buildings and places, which may not have architectural or artistic value, but contribute to a sense of place, giving way to local cultures (Johnson 1985, 12). Hence, ideas about sense of place and identity of peoples have emerged. As Walsh (1992, 90-114) notices, the idea of the nation is articulated through ideas of continuity and tradition.

The question of values has become vital in modern conservation, especially the recognition of cultural diversity and relativity of values, including their social character (Brimblecombe *et al.* 1997, 390; Jokilehto 1999, 18 and 292). The scope of conservation has broadened to include the community. These new perspectives require reconsideration of the central ethical questions of conservation: why, how and for whom heritage is preserved (Federspiel 1999, 171).

2.3.10 Value-based management, significance-assessment, and inclusion of stakeholders

Kristiansen (1989, 28-29) asserts that heritage management has become fundamental for the future direction of archaeology, because it bridges political, social and archaeological environments, and controls decisions and money. However, it is widely acknowledged that it requires policies, based on information and defined priorities (Fowler 1992, 81-82).

On the other hand, it has been suggested that 'there is no perfect system of heritage management', because it adapts to changes in the economic, political, social, and physical environment (Hall and McArthur 1998, 220). Problems occur due to wider societal, philosophical, and ethical issues (Fowler 1992, 94). In this regard, questions of heritage ownership and of the interests and values of stakeholders underlie what is done. Thus, it should be understood that heritage exists because of the values people attach to it and belongs to the societies that value it (Hall and McArthur 1998, 220; Pearson and Sullivan 1999, 33). This is the reason why interpretation and preservation lately place heritage in its historical and cultural context (Carter and Grimwade 1996, 53).

Given the above, values have been prioritised in the process of management and conservation decision-making. They set priorities in deciding interventions and establishing their extent and nature (Feilden 1994, 6; Stanley Price 2003, 285). Ascribing values and assessing the cultural significance of heritage is the approach set out in the *Burra Charter* (Demas 1997b, 153; Marquis-Kyle and Walker 1992, 21; Levin 1992, 4-7; Truscott and Young 2000, 102) and adopted by the Getty Conservation Institute too, for assessing the cultural significance of places. Respect for cultural and heritage diversity and the different perceptions of values and conceptions of 'appropriate' treatments in different cultural settings and heritage contexts, through the *Nara Document on Authenticity* (Stovel 1995, xxxv-xxxvi), gradually emerged. It is maintained that conservation only makes sense if we understand why a place is worthy of conservation, and 'what distinguishes what might be conserved from what will not is value or significance' (Clark 2001, 12).

Yet, questions of identity, meaning and values indicate the probability of conflicting notions of ownership attached to heritage and, therefore, conflicting sets of values and interests (Hall and McArthur 1998, 4). Often value priorities are decided upon the interests of particular groups (archaeologists, national authorities, tourism operators) and refute legitimate values of other groups (Feilden and Jokilehto 1998, 18; de la Torre and Mac Lean 1997, 12; Pearson and Sullivan 1999, 17-20). This is why, identification, understanding of and constructive work on values is endorsed to ensure that heritage ownership is a rich experience and preserve heritage for the future (Hall and McArthur 1998, 220; Stanley Prince 2003, 286).

In this sense, it is now broadly accepted that determination of values must be made in consultation with all stakeholders, and 'reflect a long-term view of the site' (de la Torre and Mac Lean 1997, 12). Thus, the concept of stakeholders (individuals, groups, and organisations interested in heritage) becomes important. Communication with them and their associated values leads to their involvement so as to satisfy their needs and interests. It can be empowering for heritage managers, as opportunities are provided for new ways of actions. Additionally, communities supply political support by endorsing heritage management, as their confidence in systems increases (Hall and McArthur 1998, 41-55 and 221).

However, exclusion of local people from management processes is common worldwide. Only recently the situation has begun to change (Timothy and Boyd 2003, 276), probably due to the understanding that the more the public participates in these processes, the more the site becomes intelligible to them, and the more likely is to be preserved (Stanley Price 2003, 288). Thus, values and stakeholders have developed into fundamental notions in the process of management and conservation. This approach can advance further, since the implementation of these notions is still in its initial stage. Ways of applying them can evolve. Nevertheless, unless the significance of these concepts is fully understood by heritage managers and those involved in the field, efficient conservation and management decisions cannot be made for preserving heritage, both as scientific record and as cultural resource.

2.3.11 Economics and heritage conservation

A considerable aspect of conservation and management is the role of economics in decision-making and implementation. This realisation has led to investigation of approaches for assessing the economic and cultural values of heritage and the way in which they interrelate.

Economics are connected to conservation by influencing decisions, shaping policies, encouraging, or not, heritage use, enabling conservation work through financing, and motivating stewardship (Mason 1999, 4). The economic agenda dominates heritage, since governments can easily withdraw from financing culture, and because jobs, income, wealth, and taxes can be generated by preservation and conservation (Bluestone *et al.* 1999, 19-20). Hence, economics and heritage conservation are strongly linked, influencing approaches. Possible contradictions between these two fields could prove detrimental for heritage.

Debates on economics and conservation emerge because, from the economic point of view, scarcity of resources, the public nature of cultural heritage, and the incentives of those who administer and those who enjoy heritage are important, while from the cultural viewpoint, only values and culture matter (Klamer and Zuidhof 1999, 23-24). Moreover, economics cannot provide for heritage values, such as 'historical meaning, symbolic and spiritual values, political functions, aesthetic qualities and the ability of heritage to form the identity of communities' (Mason 1999, 2).

In this regard, Throsby (1999, 19) suggests that heritage should be conceived as cultural capital because heritage exploitation is not sustainable in the long term. Multidisciplinary frameworks and tools should be devised to assess values, while mutual understanding between cultural and economic concerns is essential (Mason 1999, 2-4). Yet, economics are considered to have assisted in applying the notion of sustainability in heritage conservation, in terms of the values of current and future generations (Bluestone in Bluestone *et al.* 1999, 21).

Accordingly, the suggestions by the professionals focus on the conservation field's finding 'ways of engaging the power and influence of the economists' work and business thinking' (Mason 1999, 6). In this way, the cultural and the economic discourses may discover ways of relating, joining and balancing approaches and ideas into policies for effective heritage protection and preservation.

2.3.12 Ideas of holistic site management

Ideas about holistic approaches in heritage management dominate theories and practices. Obviously, the concept of holistic management is still evolving and will keep advancing, enriched with new ideas. A fundamental aspect of this approach is the inclusion of multiple meanings in the concept of heritage (Feilden and Jokilehto 1998, 11), as it has been discussed above. Thus, the starting point becomes the incorporation of all types of heritage into management practices and processes.

The main aims of holistic management have been succinctly articulated by Cleere as 'an ideological basis in establishing identity, linked with its educational function, an economic basis in tourism, and an academic function in safeguarding the heritage database' (1989, 10). Yet, it is widely argued that the principal objective of management should be to preserve the cultural significance of the site, as determined by the values society perceives in it (Pearson and Sullivan 1999, 82 and 126; Sullivan 1997, 15). In this regard, the community that values and *owns* the heritage resource becomes central to management decisions (Hall and McArthur 1998, 57).

Hence, effective management evolves in four steps, according to Pearson and Sullivan (1999, 8-9): location, identification and documentation of resources; assessment of values or significance of places to communities; planning and decision-making aimed at preserving significance; and implementation of decisions. Strategies to be employed should attend to visitor management, physical protection, condition monitoring, maintenance, and ongoing evaluation (de la Torre and Mac Lean 1997, 13). Sullivan (1997, 17) further stresses the importance of assessing management policies. Accordingly, efficient approaches need to be planned, with consideration of a holistic perspective of heritage and the ways in which it should be safeguarded. Constant assessment of strategies provides a better insight of how to manage heritage in harmony with the perceptions of all stakeholders.

Although it is stressed that stakeholders should articulate values perceived in the site and define their wishes in terms of management (de la Torre and Mac Lean 1997, 13), in practice emphasis is placed only on sharing information, whereas participation in decision-making is practically refuted (Hall and McArthur 1998, 58). Thus, further work should be done so as to move from theory to effective practice.

Further to that, visitor management is crucial too (Hall and McArthur 1998, 107; Timothy and Boyd 2003, 157; Shackley 1999, 80), as it maximises the visitors appreciation and enjoyment of heritage and minimises the risk of damage (Pearson and Sullivan 1999, 277). Well thought-out tourism can contribute to changing attitudes (Perier-D'Ieteren 1998, 13). This is why, Feilden (1993, 59-60) suggests codes of practice to guide tourism development and ensure co-ordinated efforts. Proposals include the employment of techniques, so that visitor numbers neither detract from enjoyment of sites nor prevent their appreciation or cause physical harm, management costs are reduced, while political support for conservation, foreign currency, jobs, and income is generated (Feilden and Jokilehto 1998, 7 and 100). On the other hand, educating and raising people's awareness of the physical and socio-cultural environment are fundamental to achieving sustainable development (Drost 1996, 482). This is why the notion of sustainable tourism development is linked to heritage management (Timothy and Boyd 2003, 132). *Sustainable* approaches 'seek to retain full range of options for future choices, and not diminish long-term cultural assets by making them instantly and easily intelligible' (Baker 1999, 2).

In addition, marketing has recently become part of heritage management but should be utilised as a tool integrated into the broader planning process in order to mutually benefit sites and visitors. Stages important in the process are: identification of visitors and how the site meets their needs; setting objectives and strategies; activities that allow heritage attractions to compete for selected target markets and reach these targets; evaluation that involves collecting information and developing insights to improve the quality of decision-making (Hall and McArthur 1998, 139-

141 and 191-217). The importance of marketing is, hence, identified through its ability to attract visitors but also include all stakeholders, assess the end result, and find ways to improve practices and strategies.

Accordingly, physical conservation and restoration are also of principal importance (Hall and McArthur 1998, 8). Yet, policies should be developed in awareness of conservation philosophies and technical measures (Stanley Price 1989, 292).

2.4 Concluding remarks

As heritage management develops fast, people able to deal intelligently and sympathetically with the above-mentioned issues are needed (Fowler 1992, 106-107). Fundamental changes of ideas and perceptions of heritage and its management and preservation have emerged and challenged practices. As Jokilehto observes, 'the question of heritage management has become one of the key issues in conservation' (1999, 318). On the other hand, the debate on the propriety of the variety of interventions in archaeological remains is enriched by new concepts and attitudes. It is now the responsibility of the current and future generations of heritage specialists to continue, advancing approaches and critically examining situations.

CHAPTER 3: ANASTYLOSIS: CURRENT ISSUES

The previous charter has set out important issues related to the current context of cultural and archaeological heritage management. This chapter explains what these matters raise with regard to anastylosis and its future, focusing on aspects of terminology, theory and practice.

3.1 Terminology

Anastylosis (*αναστήλωσις*) is a Greek word, included in the architectural conservation vocabulary, initially in Greece and later in the rest of the world. In the 1st century AD, a long controversy between Iconolatry[1] and Iconoclasm[2] in the Orthodox Church ended (843 AD). Since then anastylosis was connected, as restoration of icons – '*αναστήλωσις των εικόνων*'-- with the triumph of the restored Orthodoxy over Iconoclasm and had a special denotation for Byzantine art and history (Dimacopoulos 1985, 16).

In 1931 an international conference dealing with architectural conservation and its basic principles was held in Athens. Nikolaos Balanos, a Greek engineer who led the re-erection of the Acropolis of Athens from 1895 to 1940, described his working method as *anastylosis*, which he defined as the re-assembly of existing but dismembered parts of a monument, and contrasted it with reconstruction. The conference concluded in recommendations, *The Athens Charter for the Restoration of Historic Monuments*, which endorsed his concept of anastylosis (Demas 1997b, 151; Dimacopoulos 1985, 16;

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[1] The worship of images as symbols, distinguished from idolatry – the worship of the images themselves (Brainy Dictionary 2004).

[2] Iconoclasm, literally "icon-destruction," was a theological debate involving both the Byzantine church and state. The controversy spanned during the years 726–787 and 815–843. Imperial legislation barred the production and use of figural images and the cross was promoted as the most acceptable decorative form for churches. Archaeological evidence suggests that in certain regions of Byzantium, existing icons were destroyed or plastered over (The Metropolitan Museum of Art 2000-2006).

Schmidt 1997, 43-44). In practice, Ross, Schaubert and Hansen, working in the Acropolis in 1835-1836, possibly offered the first working examples of the process, and their work probably influenced Balanos's perception and conduct of restoration (Dimacopoulos 1985, 16).

Anastylosis has been variously defined in conservation documents as the re-instatement, re-assembly, or re-composition of original/existing but dismembered parts of a monument (ICOMOS 1931, ICOMOS 1964, Carta del Restauro Italiana 1931, ICOMOS New Zealand 1992) (Appendix C1). Michaelidis, Filintra and Christofidou (1987, 259) analysed the word and concluded in defining anastylosis as 'the re-erection of a ruined structure from its original parts found dispersed in the surroundings of the monument'. Feilden in his *Glossary of Building Terms* describes anastylosis as the 're-erection of fallen pieces of a ruin, in order to re-create the original as far as possible' (1994, 415). Similarly, Plenderleith defines anastylosis as the 'rebuilding of a fragmented monument from its elements' (1968, 129). According to Sanpaolesi (1973, 210), '*anastylosis* is a word derived from ancient Greek, meaning to 'place upright and column'. He claims that '*αναστήλωσις* derives from *στίλος*', which he translates as column (Sanpaolesi 1973, 210; Dimacopoulos 1985, 27).

This definition is refuted by Dimacopoulos who analyses the term etymologically as 'any upright piece of stone' (Patricio and Van Balen 1993, 87-88). He insists that Sanpaolesi's etymology is wrong since there is no *στίλος* in Greek, but only *στύλος* which means 'post, column'. This explains the existence of *y* in the present forms of the word in the English, French and German transliterations. Since there is no *y* in the Italian alphabet, there could only be *anastilosi* in Italian language (Dimacopoulos 1985, 27).

Additionally, he argues that the word *αναστύλωσις* does not exist in Greek[3], asserting that in Modern Greek exists only *αναστήλωσις*, a noun deriving from the verb *αναστηλώ* (*αναστηλώνω* in Modern Greek). The verb *αναστηλώ* is etymologically formed by the

[3] However, the word *αναστύλωσις* (together with the verb *αναστυλώ*) does exist in Greek and it means 'support in/with pillars, columns' (Tegopoulos-Futrakis 1993 *Greek Dictionary*).

prefix *ανά-* that means 'up, over', and the verb *στηλώ* that comes from the noun *στήλη (stele)*, which means 'any upright piece of stone'. He continues that *anastylosis* (in English and German), *anastylose* (in French), and *anastilosi* (in Italian) should be replaced with *anastelosis*, *anastelose*, and *anastelos*i respectively. In this way, the correct spelling and etymology of the word will be re-instated and allotted with uniformity (Dimacopoulos 1985, 24-27). In the *Dictionary of Ancient Architectural Terms* (Orlandos and Travlos 1986), however, the verb *αναστηλώ (anastylo)* is defined as to 'raise, erect something as a monument'. *Αναστήλωσις (anastylosis)* means 'the afresh rising of a fallen stele in its vertical position, even of the whole monument, or of other architectural or decorative members'.

Thus, variations in usage remain. Confusion emerges when concepts are used beyond their defined limits and problems are caused due to differences between languages and disciplines (Jokilehto 1999, 304-305). For some professionals this confusion can signify problems in practice (Dimacopoulos in HE 1986, 19).

The term *anastylosis* has also developed different uses in countries and regions. As Feilden remarks, 'the word is probably scarcely known to more than a few Anglo-Saxon practitioners of conservation, while it is almost equivalent to conservation in the minds of some Latin experts' (1994, 252). Both in Italy and Greece, the word implies archaeological restoration. According to Dimacopoulos, 'a wrong and old-fashioned interpretation of anastylosis led to the re-erection of certain monuments in Italy....described by Ceschi as *restauro archeologico*' (1985, 18-19).

In Greece, the term has acquired the meaning of both anastylosis and restoration, as the word *restoration* does not have a precise Greek counterpart. The plural term anastyloseis (*αναστηλώσεις*) implies several degrees of intervention, such as preservation, consolidation, restoration, rehabilitation, and reconstruction (Dimacopoulos 1985, 19; in HE 1986, 17). Dimacopoulos suggests that Greek restorers and conservation architects should 'reduce the multitude of meaning that traditionally attribute to *αναστήλωσις*, confine the use of the word only to what was accepted in the *Venice Charter* as anastylosis, and find or invent another word for restoration' (1985, 19). Yet, recent attempts to introduce the word *apokatastasi* (*αποκατάσταση*) for restoration were opposed by the power of tradition (Dimacopoulos 1985, 19; Michaelidis *et al.* 1987, 259).

The difference between anastylosis and reconstruction is that 'the former refers to the use of original members, while the latter results in a new construction using an extensive amount of new material' (Jokilehto 1995, 70-71). Schmidt confirms this idea by sustaining that: 'a re-erection, when done strictly as anastylosis, differs visually from a reconstruction that introduces new materials' (1997, 46). From another viewpoint, the difference between anastylosis and reconstruction is directed towards their differentiation of manner, degree and extent, while both interventions are considered as restoration methods (Mertens 1995, 113).

It seems, therefore, that professionals continue to use the term anastylosis in various ways (Appendix C2). This multitude of meanings and definitions ascribed to anastylosis has led to some confusion in the architectural conservation world.

3.2 Theoretical and Practical Aspects

3.2.1 Anastylosis in relation to architectural conservation and heritage management

The concept and practice of anastylosis is closely related to architectural conservation and management. Its place within the international debate and legislation can also be explored through the international conservation charters (Appendix C3).

In the *Athens Charter* (ICOMOS 1931) Article IV is dedicated to restoration, while anastylosis appears in Article VI 'The Technique of Conservation'. Accordingly, in the first half of the 20th century restoration was perceived as the conservation-intervention to monuments and anastylosis was the technique employed for such interventions.

In the *Venice Charter* (ICOMOS 1964) anastylosis is considered the treatment of ruins emerging from archaeological excavations. The charter calls for reconstruction to be '*ruled out a priori*' (Article 15). Dimacopoulos (1985, 16-18) remarks that reconstruction and anastylosis are not connected in the *Venice Charter*, though they appear together in Article 15. According to him, the only established connection there is between a ruined monument and reconstruction or anastylosis, implying that the methods are perceived as 'the two sides of the same coin', with reconstruction being rejected. Similarly, Erder (1995, 29-30) confirms that, in the specific article, reconstruction was abandoned and anastylosis was projected as the most appropriate method of protecting ruins.

Currently, anastylosis and reconstruction are considered as different extents of intervention to monuments. For instance, according to Mertens (1995, 113), they are both included among four different options, the other two being the clearing and conservation of the site and its arrangement for visitors, and the display of examples of its architecture.

At the same time, anastylosis of ancient monuments, as applied in the Mediterranean region, is not considered to be guided efficiently by the international framework, and the *Venice Charter* in particular (see AA 1996). Establishment of commonly accepted intervention limits for classical monuments (Lavvas in AA 1996, 80; Kokkoliadis in AA 1996, 20), delineation of practical anastylosis rules (Petrakos in AA 1996, 4), and, even, a new charter dealing exclusively with anastylosis (Giraud in AA 1996, 73) are proposed.

On the other hand, preservation and presentation of monuments and sites are strongly connected in the theoretical and practical framework of safeguarding heritage. The *Charter for the Protection and Management of Archaeological Heritage* (ICOMOS 1990) states that the objective of management is preservation and conservation of monuments (Article 6), while presentation and interpretation of a monument or site can promote understanding of the origins and development of modern societies and of the need of its protection (Article 7).

Accordingly, anastylosis becomes a significant aspect of heritage management and planning, chosen as part of the presentation and conservation strategy of a site and its monuments, in relation or in contrast to other solutions, e.g. *in situ* conservation, storage, complete reconstruction.

3.2.2 The decision to implement anastylosis

Multiple issues are raised by the different motivations for undertaking any form of intervention at archaeological sites, including anastylosis. These issues relate to the extent and aims of the intervention, as well as the specific problems presented by the monument in question.

3.2.2.1 Type of buildings

Many professionals have suggested that anastylosis applies to monuments originally erected with regularly cut pieces of stone, connected to each other with little or no mortar, and with small metallic joints (Bouras in AA 1996, 26; Dimacopoulos 1985, 18). In this sense, the elements preserve their autonomy and constitute 'existing but dismembered parts' that can be integrated and re-positioned (Dimacopoulos 1985, 18). The dry masonry structure allows for restitution of the original shape (Hueber 2002; Philippot 1996c, 362). Every member can take up its original position (Bouras in AA 1996, 26; Dimacopoulos in HE 1986, 17; Karadedos and Lavvas 2000, 5; Mertens 1995, 115). Such architectural and structural characteristics appear in monuments of the Greco-Roman world, but are also present in other monuments worldwide, built from autonomous members.

3.2.2.2 Surviving material

The survival of original material forms a determinative factor (Hueber 2002; Mertens 1995, 115; Patricio and Van Balen 1993, 87). Elements lying on the ground for centuries may suffer from erosion (Hueber 2002; Philippot 1996c, 362), which complicates decisions on their use. If only the best-preserved elements are used, then the quantity of original material is often severely reduced (Dimacopoulos 1985, 18; in AA 1996, 45). Yet, anastylosis using distorted members may deprive a monument of its artistic interest (Bouras in AA 1996, 28), and brings into question the restoration of architectural characteristics and form (Mertens 1995, 119). Generally, it is maintained that re-erection of original parts should depend upon configuration of the remains and their state, specifically, if they retain their original form (Frin 1966, 94; Starosta 1999, 83-84).

3.2.2.3 Archaeological and architectural knowledge and scale of interpretation/conjecture

Avoidance of conjecture is strongly advocated in the *Venice Charter* (Article 9), while archaeological and architectural research should precede the intervention. As it will be shown in the case studies, these prerequisites are closely followed.

In this regard, knowledge of the original location of dismembered parts is fundamental (Patricio 1996, 102; Patricio and Van Balen 1993, 88; Plenderleith 1968, 130). However, this becomes a requirement of an ideal anastylosis, as it is practically impossible to know where exactly in the monument each member was located, unless an earthquake destroyed the structure and all its elements fell, following their original location in the structure. As it will be shown in the case studies, efforts are made to re-assemble members in their original location, but if that is not feasible, then they are placed in equivalent locations.

3.2.2.4 Structural stability and conservation

Structural stability and conservation are urgent reasons for anastylosis, according to many practitioners (Dimacopoulos 1985, 18; Karadedos and Lavvas 2000, 6; Mertens 1995, 114). The re-assembled parts offer each other protection from weathering and pollution (Hueber 2002), although not all professionals agree with that (see Schmidt in Jokilehto 1995, 71). Destruction of monuments due to accidental or violent phenomena, i.e. earthquakes, is also determinative (Feilden 1994, 252; Patricio 1996, 102), as most members will possibly be present around the monument.

3.2.2.5 Aesthetics

For some professionals it is unclear whether cultural, aesthetic, or educational reasons justify anastylosis. However, they project them in relation to the aesthetic values of monuments and the elevation of structures (see Karadedos and Lavvas 2000, 6).

An emerging issue relates to anastylosis being characterised as 'ruin architecture' by Schmidt in his discussion of the way archaeological sites are presented. Schmidt distinguishes between *intellectual, natural* and *objective* ruins. *Natural ruins* relate to ideas of 'picturesque' developed in the 18th century, and the adopted approach aims at the use of anastylosis. A destroyed monument, however, cannot be regained and the result of anastylosis becomes an *artificial ruin*, a new construction with old fragments (Schmidt in Jokilehto 1995, 70).

3.2.2.6 Academic research

Facilitation of archaeological and architectural studies of a monument (Hueber 2002) is considered a significant result, as well as reason for anastylosis. Evidently, in order to plan and implement anastylosis we should have extensive knowledge of the archaeology and architecture of the structure. Moreover, the research undertaken before performing anastylosis will increase our knowledge and understanding of the monument.

3.2.2.7 Identity

Heritage can play a role in enforcing national or cultural identities of nations, regions, and social groups (de la Torre and Mac Lean 1997, 5-6), making this factor determinative of the extent and aims of anastylosis.

Heritage can be an integral part of nation building, creating a sense of belonging to a place. Many nations 'used concepts of common roots and shared past adversities and achievements', and monuments can have symbolic meanings and serve as 'icons of an emergent state' (Herbert 1995, 13-14). For instance, anastylosis of the Parthenon in the Athenian Acropolis initiated when Greece emerged as independent state after the long-term Ottoman occupation; reinforcing the Greek national identity was essential for the re-born nation (Jokilehto 1999, 89; Mallouchou-Tufano 1998, 55).

Preservation of historic memory, related to the identity issue, is considered to be achieved through retention of the material of the monument, and, thus, becomes a reason for anastylosis (Dimacopoulos 1985, 18; Hueber 2002; Mertens 1995, 114).

3.2.2.8 Interpretation and education

Making the volume of a building more easily visualised improves its legibility and makes it better understood by viewers (Schmidt 1997, 42; Sivan 1997, 52). Re-assembly of dispersed elements on the monument renders the structure more comprehensible, providing informative didactic treatment (Dimacopoulos 1985, 18; Hueber 2002; Mertens 1995, 114). Anastylosis, therefore, contributes to reinstating, preserving and transmitting the image of monuments (Doumas in AA 1996, 64), especially as 'meaningless heaps of stones do not give an instructive message to the beholder' (Feilden 1994, 10). With anastylosis, the form of the monument is reinstated and its shape is restored (Philippot 1996c, 361; Schmidt 1997, 45; Dimacopoulos 1985, 18; Starosta 1999, 87). Additionally, interpretation enables visitors understand archaeology, and, thus, 'can convert them from puzzled tourists into advocates for archaeological research and conservation' (de la Torre and MacLean 1997, 9).

For Giraud (in AA 1996, 71), reconstruction and extensive anastylosis are unrealistic for two reasons: because there is great danger of creating hybrid monuments and because the public, including the professionals, have been accustomed to experiencing monuments in fragmentary state. The latter is an interesting observation, since it is true that most monuments, at least in this part of the world, survive ruined and it becomes exceptionally difficult to understand their form or imagine what they might have looked like. Due to this reality, full reconstructions and restorations are not necessary. Indication of the form of the monument may suffice to enhance its understanding.

Educational values are strong in many anastylosis projects, because benefits deriving from a restored monument are appreciated by many groups (de la Torre and MacLean 1997, 9). It is argued by some, however, that education should be a result, not primary objective, of anastylosis (Dimacopoulos in AA 1996, 43). Others even assert that it is the public that must try to understand the monument (Mallouchou Tufano 1998, 112). Contrary arguments emphasise that non-experts should not be deprived of experiencing the monument because they do not have the ability to imagine it recomposed. Understanding its form attracts the interest of non-experts. But, if the public cannot experience the monuments, they may be disdained socially and, thus, endangered (Lambrinoudakis in AA 1996, 76-77).

In this regard, the critical dispute between Greek professionals on '*didactic anastylosis*', a concept promoted by the Committee for Conservation of the Acropolis Monuments (see Korres and Bouras 1983, 403-405 and 417-418) emerges. The concept projects the educational value of anastylosis as a feature that may or may not be included in the intervention. This is why the term is often refuted by Dimacopoulos (in AA 1996, 43), who argues that anastylosis and any architectural conservation and restoration include educational aspects, but these aspects should not be primary objectives; it depends on the individuals too. This statement holds a truth, but anastylosis is not undertaken only for conservation and preservation. As it will be indicated in the case studies, educational reasons influence its extent. Yet, I would tend to emphasise that education can be achieved with a combination of methods, such as anastylosis and small-scale models. This is exactly what Dontas (in AA 1996, 14) states when he underlines that educational aspects cannot be accomplished without full reconstructions or small-scale models.

Dontas (in AA 1996, 14) also adds that the educational aspect is offered as a social commodity. In this regard, educational values are closely related to social values and to informing the public about a culture that may be lost (in the case of the classical monuments) but whose monuments are still present in our lives and enhance our understanding of society.

3.2.2.9 Tourism and visitor management

Tourism is related to access, marketing, and interpretation of heritage sites (McManamon and Hatton 2000, 1-19). Most importantly, tourism entails various notions such as identity, improvement of legibility and education – encapsulated in interpretation –, accessibility, and creation of revenue. As such, tourism becomes a significant aspect of architectural conservation. However, as de la Torre and MacLean (1997, 11) point out, the lack of communication observed between the tourist industry and the heritage sector is aggravated by prioritising economic values. This is only one part of the argument. Firstly, tourism includes not only international visitors to the site but also the national people and those who live close to the site. In all cases, generation of income is simply one aspect. On the other hand, the ultimate aim of conservation is to safeguard heritage for future generations. Thus, making heritage legible and understood by the wider public, as well as connecting it to the past history and identity of people, is a great incentive for heritage conservation and management.

In this regard, many professionals seem to agree that excavation, anastylosis, and use of monuments are often encouraged to satisfy the perceived needs of visitors (Demas 1997a, 147; Melucco-Vaccaro 1996a, 204; 1996c, 330). For presentation and interpretation purposes that aim at commercial benefits, 'heritage may become creation or adaptation, rather than preservation of what actually exists' (Herbert 1995, 12). Allowing tourism to set the agenda for what happens on a site has proved destructive for sites and monuments (Demas 1997a, 147). Hence, many professionals argue that attraction of visitors should not be the aim (see Schmidt 1997, 50). Yet, this is slightly contradictory in the sense that attraction of visitors does not necessarily mean attraction of revenue, but also appreciation and understanding of the restored heritage.

It is acknowledged that heritage professionals ideally should protect the scientific value of the archaeological record and achieve its presentation in a 'visually stimulating and thought-provoking manner', while 'maintaining historical accuracy and respecting the integrity of ruins' (Sivan 1997, 52). Fulfilment of these prerequisites necessitates careful consideration of the scale of intervention and of how we should preserve and present heritage as a matter of social responsibility and of providing access to the public versus the tensions placed upon the heritage resource.

3.2.2.10 The public

Currently, ideas about involvement of the public in conservation and management decision-making are dominant. They are reflected either in the international theory, as reflected by the *Burra Charter* (1999), which recognises the need to involve people in the process, or in the consultation of 'indigenous' peoples for deciding appropriate conservation treatments, such as the ICOMOS *New Zealand Charter for the Conservation of Places of Cultural Heritage Value* (1992). In anastylosis, education of the public and increase of visitation to the site are emphasised. Thus, public consultation and provision of information becomes an emerging issue.

3.2.2.11 Landscape setting

A focal aspect of implementing anastylosis and, in turn, increasing the scale of the ruined monument regards the harmonious integration of the restored structure in the landscape (Plenderleith 1968, 130). As it will be indicated in the case studies, the impact of a restored monument in an archaeological site with remaining ruins creates strong contradictions. Many past examples of such actions are currently judged as inappropriate. Thus, modest solutions are the ultimate aim of conservation and preservation nowadays, as major antithesis between restored and un-restored monuments within a site is not considered successful. This is why Plenderleith (1968, 130) declares that extensive anastylosis is 'an unpardonable error' and Feilden (1994, 10) is concerned with its devaluing the message of a site.

3.2.2.12 Authenticity and integrity

For many professionals, integrity – meaning material wholeness or completeness (Jokilehto 1999, 298-299) – should be principle and goal of anastylosis (Plenderleith 1968, 129; Mertens 1995, 115).

Accordingly, the creation of 'hybrid monuments' (Giraud in AA, 1996, 71) becomes an essential question of conservation (Philippot 1996b, 270). This is why it is repeatedly emphasised that starting point is the notion of authenticity (see Lavvas in AA 1996, 79). In this sense, any intervention in a monument 'can only refer to a knowledge of the lost object, and such a knowledge cannot be identified with the real object without faking' (Philippot 1996c, 362). However, authenticity is a notion that becomes quite difficult, not only to define, but also to apply to anastylosis and any other intervention. If we take into account the straightforward connotations of authenticity, then the result will be a decision on leaving the monument as found and not intervene at all. If we decide on anastylosis, then other considerations and objectives will influence the choice, implementation, and extent of the intervention. Thus, flexibility in our definition and judgements of authenticity should precede. Additionally, some professionals agree with the idea that the 'need for conservation of monuments as cultural commodities and their *use* as exhibits, make the intention of anastylosis ethical' (Bouras in AA 1996, 25).

Respect for material authenticity in anastylosis is strong. As Giraud maintains (in AA 1996, 71) experiencing monuments as works of art is achieved through recognition of the authenticity of material, 'since we cannot do much about the authenticity of their original form. Lavvas (in AA 1996, 79) also declares that the essence is found in authenticity of material. Yet, he explains that preservation of historical memory depends primarily on preservation of authentic form. This comes into contradiction with Giraud's statement. The only way to relate authenticity of material and of form is that original material is the aspect closest to the original form.

Despite the above, professionals agree that respect for material authenticity should be shown through minimum interventions and easily distinguished integrations (Bouras in AA 1996, 28; Giraud in AA 1996, 71; Plenderleith 1968, 129). Authenticity can also be maintained with traditional skills and technologies, and preservation of the context (landscape and surrounding structures).

3.2.2.13 Minimum intervention

Generally, it is endorsed, though not strictly followed, that intervention should be kept to a minimum (Giraud in AA 1996, 72), and that the remains should be principal *actors* rather than used as stage design (Sivan 1997, 53).

Kokkoliadis (in AA 1996, 19-21) maintains that the determination of methods and limits in anastylosis upholds a philosophical speculation, according to which 'the accepted limits of anastylosis should be a matter of philosophical speculation and not technical, as methodology is'. This idea is interesting and offers some indications of how to approach issues on the extent of anastylosis. On the other hand, it would probably be best not to classify those issues in terms of them being purely technical or purely philosophical. As it will be shown in the following chapters, all aspects of anastylosis are so closely related that we could not exclude any point of view when discussing them.

Other approaches, concerned with classical architecture, have implications on the way we define and decide the extent of anastylosis. Specifically, they are based on the notion that the values of classical art and architecture are embodied in the notion of entity, which is never placed before the notion of parts (Dontas in AA 1996, 8). As sustained by Karouzos (in Dontas in AA 1996, 9), 'a classical part expresses values both individually and as part of the whole'. This is the reason why Dontas sustains that even when the initial function of the monument is lost, aesthetic and historical values are included in its smallest fragments (in AA 1996, 9). Therefore, preservation of the entity may not be absolutely necessary and an intervention that is minimum and simply indicates the form of the monument would suffice.

These ideas are closely related with Brandi's thinking regarding ruins and their restoration. According to him, a *ruin* is a number of fragments that have lost their original function and aesthetic qualities and cannot be restored, because it is impossible to recover their lost unity and only maintenance of the status quo of the ruin is possible (see Brandi 1963). This is why he declared (Brandi 1963) that the concept of unity must be defined for establishing the boundaries of restoration. Yet, he maintained that a work of art is a whole, but not just a geometrical total of its parts, rather all its elements together form the whole (Jokilehto 1999, 232).

3.2.2.14 Reversibility

Reversibility is projected for ensuring the possibility of future interventions, because 'every attempt at anastylosis is potentially wrong' (Feilden 1994, 252). Prerequisites for achieving reversibility are focused on independent members remaining undamaged and on the possibility of removing additions without causing any harm to the original elements (Bouras in AA 1996, 26).

3.2.2.15 New material

The reasons for introducing new materials to replace missing parts relates to preserving the original structural system and, consequently, to the sufficiency of the static system of the monument (Hueber 2002; Lavvas in AA 1996, 4; Mertens 1995, 120). It is usually acknowledged that the use of new material should be minimal (Dimacopoulos 1985, 18; Dontas in AA 1996, 15).

Concerning completions and integrations with new material, diverse opinions are heard. For instance, Dontas (in AA 1996, 6) explains that various aspects should be taken into consideration with regard to their quantity and distribution in the surfaces of the building, their volume and shape when they are in contact with authentic members and fragments, as well as their material and colour. Hence, introduction of new material is not a simple issue, but needs painstaking thought and examination of its effects to the re-assembled fragments and structural members. It is also agreed that additions with new material should be integrated, given that the original material, the archaeological and historical evidence, and the original design of the structure are respected.

Furthermore, integrations of new material are considered acceptable – though in a relatively small scale – because they contribute to preserving the monument and allow further anastylosis of original members (Lambrinoudakis in AA 1996, 75; Lavvas in Petrakos in AA 1996, 4). Yet, care should be shown in not carving original surfaces in order to introduce this new material (see Dimacopoulos in AA 1996, 55), as it happened in past projects. On the other hand, integrations are rejected as a means of didactic treatment (Dontas in AA 1996, 13), in other words, if their introduction is decided in order to improve the legibility and enhance the educational potential of the monument. Even though legibility and education are significant objectives in anastylosis, new material should not be added if it is not necessary. If, for instance, one part of the upper structure survives intact or it has been restored using mainly original material, then there might not be any need for restoring with new integrations all other similar parts of the monument. Didactic reasons alone are not considered justifiable arguments for introduction of new material. It is rather the combination of educational and structural reasons that matters most. This is why Dontas (in AA 1996, 15) insists that 'a lot of thought and trials' are required before such decisions.

Additionally, various principles have also been suggested with regard to new additions:

1) They should always be recognisable (Carbonara in Melucco Vaccaro 1996a, 209; Schmidt 1997, 45)
2) They should remain in the background, without the unity of the whole being strongly intruded upon (Bouras in AA 1996, 28; Dontas in AA 1996, 15; Giraud in AA 1996, 72; Mertens 1995, 119). The continuity of form should be preferred compared to the direct and immediate visibility of the modern intervention (Hueber in Mertens 1995, 119), because powerful contrasts and aesthetic disruption will be caused by the aged surface of ancient members and the white protruding surfaces of new ones (Dimacopoulos in AA 1996, 56; Dontas in AA 1996, 14-15).

The principle of slight, yet harmonious, differentiation of new material from the original derives from the *Venice Charter*. However, questions regarding the differentiation of new and old material being obliterated with time (Mertens 1995, 119) are raised.

3.2.2.16 Materials and skills

Anastylosis projects, undertaken with unsound methods and techniques, can distort ruins and destroy their integrity as documents (Melluco-Vaccaro 1996b, 330; Schmidt 1997, 46). For example, the techniques and materials used in the 1930's anastylosis of the Athenian Acropolis monuments were harmful, creating problems in the current restoration project (Feilden 1994, 252).

3.2.2.17 A way forward: values and significance

Monuments and places hold diverse values for different stakeholders. Significance is ascribed when 'the place signifies or symbolises something larger and more important than merely the ruins of its architecture' (de la Torre and Mac Lean 1997, 8). It may be 'personal, local, regional, national or international; academic, economic or social' (Clark 2001, 12). Values and significance cover both tangible and intangible meanings (Pye 2001, 58).

The assessment of values is seen as starting point in conservation and management decision-making. By assessing what values should be promoted, according to the needs of the monuments and the people connected to them, decisions can be made about the manner and extent of the intervention. If the aim is to successfully restore a monument, significance and values should be clearly stated and understood. The idea of understanding the values and significance of monuments is succinctly articulated by Clark (2001, 12), who sustains that 'unless we understand why a place is worthy of conservation…conservation makes little sense'. Specifically, respect for values and the cultural significance of sites and monuments are instigated by the *Burra Charter*.

3.3 Technical aspects

3.3.1 Structural support and weight distribution

Two diverse procedures for strengthening the supporting system have been employed, according to Starosta (1999, 83-90). In the early examples (1835-1930) a high proportion of original material was used, with the tendency towards constructions resembling the ancient supporting system. From the end of the 1930's and up until the 1970's, the static construction system was altered by inserting new supporting elements of reinforced concrete. Since the 1970's, the approach tends to return to the original structural system. Attempts are made to achieve a distribution of weight as similar as possible to that of the original structure, although missing connections often necessitate the strengthening of links with new connection dowels.

3.3.2 Joining blocks

The joining of building blocks presents problems according to different materials, such as marble, limestone, or sandstone. The recent trend has been to use epoxy glue (after laboratory analysis of stone) to replace cement as a joining material for broken fragments. Stainless steel and fibreglass armatures have also been used (Mertens 1995, 119-120), while more recently titanium has been preferred.

3.3.3 Type of new material

When new materials are required, many professionals consider it essential to use materials similar to the original ones (Mertens 1995, 115), although it may be difficult to obtain them (Michaelidis *et al.* 1987, 260). New building elements can be worked in either natural or artificial stone. Natural stone has aesthetically satisfying results, but apart from the difficulty of procuring similar stone, this solution is often costly, lengthy to execute, and requires skilled masons. Artificial stone is fast and simple to work and it is considered to guarantee optimal adhesion of the old material to the new. However, it can be too homogeneous and lifeless – or even endanger the individuality of structural members (Bouras in AA 1996, 28). Moreover, it often has different expansion and porosity qualities from the natural one, and can present decay problems, especially when bonded with cement. Hence, the exact matching of materials, in terms of compatibility and similar qualities with the original ones, by means of laboratory tests is suggested (Mertens 1995, 120-121).

3.3.4 Multi-disciplinary teams

Architects have traditionally had the lead role in anastylosis projects, as they possess technical and theoretical knowledge (Michaelidis *et al.* 1987, 260). However, anastylosis 'must be the work of a group of special expertise from many fields – archaeologists, architects, civil engineers, art historians, chemists, physicians, conservation specialists and others – whose opinion is important and respected' (Doumas in AA 1996, 65). Additionally, while it is acknowledged that technical knowledge, scientific personnel, and skilled craftsmen are required, anastylosis professionals also need to be educated about architectural history, archaeological principles, and aesthetics (Dimacopoulos 1985, 18; Dontas in AA 1996, 6; Mertens 1995, 121; Michaelidis *et al.*1987, 260).

3.3.5 Background research and project planning

Detailed study of the available data, including the study of original components, determination of their location, and exploration of construction techniques, is essential for effectively planning anastylosis (Patricio 1996, 102; Patricio and Van Balen 1995, 146). Plans should be prepared carefully and after meticulous studies on the architecture and structure, since mistakes may have destructive results.

The knowledge and experience gained from restoration projects enhances scientific research and understanding. Thus, anastylosis should be regarded as integral part of architectural historiography, which in turn leads to understanding the original building (Mertens 1995, 115; Patricio and Van Balen 1993, 88). In this sense, anastylosis becomes the practical aspect of archaeology (Petrakos in AA 1996, 1).

3.3.6 Advances in information technology

Recent developments in computer visualisation, including virtual reality models (Pollefeys *et al.* 2000, 77), potentially offer flexibility in the interpretation and presentation of monuments (Ryan 1996, 97). Computer-aided analysis of buildings assists in the analysis of buildings, characterising structure and materials, and modelling deterioration (Moltedo *et al.*2000, 59). Restoration and conservation options can be explored (Marini *et al.*1997, 1655). Techniques make possible virtual reconstructions (Pollefeys *et al.* 2000, 77). 3D models of reconstructed buildings can be inserted into their actual physical environment (Martens *et al.* 2000, 206-209). Their significance lies in their double role in providing support for restoration specialists and being the basis to implement education multimedia for the public (Marini *et al.*1997, 1656). Such applications of information technology offer great possibilities in background research and project planning and in presenting monuments.

3.3.7 Documentation

Thorough documentation, through archaeological and architectural studies, combined with detailed publication, is of extreme importance for underpinning project planning and documenting outcomes (Lavvas in Petrakos in AA 1996, 4; Plenderleith 1968, 130).

3.4 Concluding remarks

Anastylosis appears in a number of international conservation charters and is considered by many as a justifiable form of intervention in ruined monuments. However, there are numerous grey areas in terms of its definition, planning and implementation. Basic etymological debates and variations in the use of the word imply subsequent differences in practice and highlight the importance of clearly defining anastylosis. Reasons and driving forces behind its implementation are inextricably linked with wider conservation decisions. Issues and principles, such as cultural significance and assessment of values, authenticity and reversibility, and preservation of the setting of the monument, are central to the implementation of anastylosis. Technical aspects of its implementation reflect scientific and technical developments in the field.

CHAPTER 4: CASE STUDIES FROM GREECE

Examination of the case studies from Greece (fig. 1) includes a brief description of each monument and its state of preservation, as well as a detailed presentation of the anastylosis programme. Discussion of the objectives of the restorers and the theoretical framework of the anastylosis follows, together with observations about issues arising from the undertaken works.

Further information and an extensive presentation of the history and the anastylosis of the monuments in question, including full bibliographical references, can be found in Appendix D. A glossary of architectural and archaeological terms is found in Appendix F. Photographs of the monuments and the anastylosis works are presented in Appendix A.

4.1 The Erechtheion and the Parthenon at the Acropolis of Athens

The monuments of the Acropolis of Athens (figs. 2-5) show many examples of anastylosis. This study focuses on the Erechtheion and the Parthenon. Their history (including their restoration history) is given in Appendix D1.

4.1.1 The Erechtheion

The Erechtheion (421-406 BC) is located to the north of the Acropolis and close to its surrounding wall (fig. 5). It stood on a platform and consisted of a rectangle cella, divided by walls into three sections (figs. 8, 9). The Caryatid porch was attached to the southwest corner of the structure (fig. 10).

From 1834, the monument underwent multiple excavations and restorations (fig. 11). By the 1970's, it presented serious problems. Its members were shattered because of oxidation and expansion of metal joints; the roofs of the façades were ready to collapse; most elements were fragmented and others had been randomly repositioned; and surfaces, especially those of the Caryatids (fig. 12), had deteriorated from atmospheric pollution. Anastylosis was undertaken between 1979 and 1987.

4.1.1.1 The anastylosis programme

The anastylosis study comprised research on historical phases and previous restorations, consultation of publications and archival material, analysis of architectural, static, and physiochemical problems, installation of the work-site (figs. 13, 14), and detailed recording of the works. The primary goal was the removal of the Caryatids (figs. 10, 12) to the Acropolis Museum to protect them from atmospheric pollution. They were replaced by copies of laboratory-tested cement, whose colour and texture matches those of the monument. Exact copies of original elements from the east porch (now in the British Museum) were placed in their respective positions (Bouras 1994a, 101-103; Casanaki and Mallouchou 1985, 80-92; Economakis 1994a, 11; Korres 1994c, 37; Mallouchou-Tufano 1994a, 13; Papanikolaou 1989, 2; 1994, 147; Touloupa 1985, 9).

Problems concerned the form, construction, and static sufficiency of the monument. The physico-chemical problems of corrosion and expansion of metal joints and the steel frame employed by Balanos, in 1902-1909, resulted in cracking of the marble and caused structural instability. Marble surfaces suffering from deterioration were stabilised. Interventions took place only in areas most affected structurally. When damages were not critical for the structural behaviour of the building and there were no indications of progressive deterioration, no action was taken. Skilled stonemasons cleared out clamps and mortar and cleaned out cuttings. As many members were placed in random locations during previous interventions, they had to be repositioned (fig. 17), permitting restoration of the subtle architectural refinements of the building. Computer programmes were employed for finding the correct locations of many members. Yet, it was not possible to avoid random assembly of some elements. Their restoration included use of white cement and hidden ties made of titanium rods, produced in laboratories. Ancient cuttings were re-used to position new joints. Completions were effected in Pentelic marble (figs. 18, 24), with pantographs. There was no sculpting of original material and only old traces were used. This method was preferred because, even though 20,000 fragments had been collected from the Acropolis plateau, few could actually be assigned with certainty to the Erechtheion, as techniques did not allow for a more accurate identification. Material foreign to the structure was removed and replaced by accurately sculpted elements (Bouras in CCAM 1977, 30-34; Casanaki and Mallouchou 1985, 81-82; Korres 1994c, 43; Papanikolaou 1989, 2-5; 1994, 137-143; Skoulikidis in CCAM 1977, 19-21; Touloupa 1985, 9; Zambas 1994a, 107-108).

The anastylosis programme was divided into five phases. These included restoration of the north, west, and south walls and of the Caryatid podium, as well as of the coffered slabs from the north porch roof and the corner of the east porch (figs. 15, 16, 20-23). Further small programmes will be undertaken, including the formulation of neutral flooring in the cella, after conservation of the lower parts of the side walls. The roof above the north porch will be restored using modern material, for rain protection. The sheltered courtyard to the north will be restored, while systematic conservation of the surfaces has been decided upon too (Bouras 2002, 16-17; Bouras and Zambas 2001, 25; Papanikolaou 1989, 2-6; 1994, 147).

4.1.1.2 Observations and discussion

4.1.1.2.1 Analysis of objectives, and whether or not they were met

The primary reason for intervening was the urgent need to amend and revert the devastating consequences of previous restorations and to tackle the effects of atmospheric pollution on marble surfaces (Papanikolaou 1989, 5; 1994, 137). Indeed, the consequences of the previous restoration were halted. Damaging material was removed from the affected parts. Members were dismantled, conserved, and then re-assembled in the correct order. The effects of atmospheric pollution on the surfaces were efficiently dealt with. The Caryatids were removed to the Acropolis museum and a series of conservation programmes were undertaken. Systematic conservation of marble surfaces was also decided. Yet, no further details were found regarding these programmes, apart from a publication (see CCAM 1994a) on the surface conservation of the Acropolis monuments.

A fundamental aim was to remove contradictions created by the previous anastylosis and to alter the image of the monument that had resulted from the unsystematic re-assembly of its members (Papanikolaou 1989, 5; 1994, 137). Yet, it has been acknowledged by the restorers themselves that some members were randomly assembled, when there was no alternative. This raises the question of whether it is acceptable or not. In comparison with the past restoration, in which chance assembly of structural elements was the norm, in the recent intervention efforts were made to locate each member and re-integrate it in the correct position. It was only when no original location could be established that corresponding ones were chosen. However, this is in direct contrast to expectations of professionals, such as Mertens (1995, 115), that each structural member should take up its original position. This is a matter that relates to preserving the original structural system of the monument and its authenticity of form and design. On the other hand, whether elements are re-assembled in their original locations is not obvious to visitors. A close look during my visits to the monument could not reveal whether structural elements had been randomly assembled or not. Obviously, random assembly in the past had consequences for the image and form of the monument but that shows only if we compare before and after photographs. Careful examination of the monument and comparison with the limited amount of visual information on its previous state does not reveal much either. The only difference is noted on the north-east part of the wall, which was much lower in height than it is now.

The reason for choosing the Erechtheion first among the Acropolis monuments was that it presented the most urgent problems and was in greater need of stabilisation. It was also a convenient choice, due to its size, to make a quick start for rescue work and acquire essential experience for further restorations on the site (Casanaki and Mallouchou 1985, 80; Korres and Bouras 1983, 664; Touloupa 1985, 8). Indeed, according to the professionals involved, stabilisation was achieved. Experience for restoring the other Acropolis monuments (the Parthenon, the Propylaea, and the Temple of Athena Nike) was attained too, as it will be shown below (4.1.2).

The restorers also judged that by assembling ancient fragments in their original locations, the monument became more legible and was qualitatively elevated, while later historical interventions are accurately discerned (Papanikolaou 1989, 4-5; 1994, 147). Legibility has theoretically been achieved, since mistakes in the form and structure have been corrected. Yet, the monument after its previous anastylosis was already legible and the differences between then and now are not easily detected.

Distinction of its later phases is not easily noted, though the Christian phase of the monument is observed on the floor, in the interior. The Roman phases or the part of the Balanos' anastylosis of 1902-1909 are not easily discerned either.

However, information on the historical phases of the monument is not available on site, apart from a notice board (fig. 26) with views and plans of the monument and a paragraph about its restoration. This brief information is provided in two languages, Greek and English. Unfortunately, this raises questions of whether this is enough information for the interested public. There are no indications on the past history of the Erechtheion and no further information promotes knowledge of the monument and its history, even though the recent anastylosis aimed at enhancing its understanding.

In general, though, the objectives of the restorers seem to have been met.

4.1.1.2.2 Theoretical framework of the anastylosis works

The restorers followed the theoretical framework of the *Venice Charter* (1964). This is standard practice in anastylosis projects in Greece, ever since the establishment of the charter. It should also be noted that at the time of intervention (1979-1987), the charter was the ultimate representation of the international restoration theory.

The multidisciplinary approach adopted during the anastylosis is in accordance to Article 2 of the charter (Bouras in CCAM 1977, 27-29; Papanikolaou 1989, 2-6). It was reflected in the wide variety of collaborating disciplines, especially archaeologists, architects who research the history of the monument and decide on its form and architecture, conservators and chemical engineers who are involved with issues of conservation of structural members, and civil and structural engineers who resolve issues of stability of the building. These experts conducted studies essential for undertaking the project, tackling the presented problems, and clarifying issues about the best possible approach. Stonemasons undertook the task of creating replacements for missing parts and connecting original and/or new parts together. Further fields were represented by other specialists involved before, during, and after the intervention. Participants in the international meeting on the Erechtheion were anastylosis specialists and seismologists, who expressed their views and discussed them analytically. Such abundance of opinions expresses recent trends, according to which multidisciplinary approaches guarantee dialogue and polyphony, as well as successful projects. This anastylosis was the first organised attempt by the Greek State after the Second World War with formal procedures, institution of working groups, and employment of scientists, archaeologists, and architects. It became the guide for similar approaches to the Acropolis and other monuments; nowadays there are five such committees in Greece.

The decision on the removal of the Caryatids to the Acropolis Museum, following Article 8 of the charter (Bouras in CCAM 1977, 27-29; Papanikolaou 1989, 2-6), initiated from respect for the sculptures, which had deteriorated quickly due to atmospheric pollution, and after taking into consideration other possible choices and that a consolidation method for the marble had not been found yet. Most experts agreed on the removal, judging that it indicated 'respect towards the valuable archaeological heritage' (Dontas in CCAM 1977, 16-17). This solution offered better protection for the sculptures. So, since the 1970's they have been kept in a protected and controlled environment, while the pollution in Athens has not improved much. Furthermore, their removal dictated their replacement by copies, according to the architect-restorer (Papanikolaou 1989, 6-7; 1994, 147), for reasons of structural stability and for maintaining the historical image of the monument. These arguments are considered reasonable since the role of the Caryatids was not only decorative but also structural – they were holding the roof of the southwest porch. The statue-like columns are a characteristic feature that makes this monument unique in its synthesis and architecture. Their removal would alter the image of the monument as it has survived over time.

On the other hand, non-valuable materials found in the structure were removed and others were preserved, such as parts of the Christian phase and the past restoration, following Article 11 of the charter (Bouras in CCAM 1977, 27-29; Papanikolaou 1989, 2-6). This has been discussed above (4.1.1.2.1).

Another issue concerned the contradiction that emerged from Article 9 of the charter, which endorses respect for the original material, and the restoration of surviving members for structural reasons. On the one hand, this was reflected in the careful handling of members and the use of ancient and past connecting points for new joints, as well as the preservation of some of the historical phases of the monument. However, as the restorers clarify (Papanikolaou 1989, 2-6; Bouras in CCAM 1977, 27-29), non-intervention to original parts was impossible due to the re-incorporation of architectural members found scattered around the Erechtheion (fig. 25a). Additionally, some previously restored members had to be dismantled to extract the material of the past intervention and then stabilised using new material and put back. The contradiction is understandable but it should not limit decisions on re-incorporating original material to the monument, since this is the essence of anastylosis. As long as the principle of minimum intervention guides the undertaken works and excesses are avoided, then original material is respected.

According to the published information, both traditional and modern techniques were harmoniously combined, in accordance to Article 10 of the *Venice Charter* (Papanikolaou 1989, 2-6; Bouras in CCAM 1977, 27-29). Experiments in laboratories tested new materials that could be employed for completions and additions. The final decision was on Pentelic marble, the same as the original material of the temple. Stonemasons using traditional crafts were employed (fig. 18). Titanium, a metal that behaves similarly to iron but is much lighter and does not oxidise, was decided upon as the connecting material, after laboratory experimentation. Titanium is only lately employed in anastylosis. Further experiments supported the use of cement mortars for the Caryatids and other sculptural copies. Although there was some criticism regarding the quality of the cast copies that replaced the Caryatids, the material was tested to ensure its endurance of the high levels of pollution in the city and its compatibility with the marble. Additionally, the copies harmoniously integrate into the monument (fig. 10). Hence, both traditional methods and modern techniques were employed to achieve the desired result.

The requirement of the charter (Article 12) for harmonious but distinguishable differentiation between new and original parts was respected with the different texture of new members and the inscription of the anastylosis date on them (Papanikolaou 1989, 2-6; Bouras in CCAM 1977, 27-29). Dates are indeed inscribed on members. Close inspection of the restored monument, however, does not indicate such a difference in the textures of new and surviving material. They rather seem quite similar (fig. 19). Maybe this visual harmony should be attributed to the use of Pentelic marble for both new and original parts. Nevertheless, chromatic difference between new and original members is more than obvious (fig. 27a), even though it is acknowledged that 'time has already softened the chromatic difference' (Touloupa in CCAM 1994b, 190).

It should be added that the new infill pieces in the interior do not harmonise with the ancient elements (fig. 27b). This is acknowledged by the restorer himself (Papanikolaou 1994, 147), who explains that the discrepancy is caused by certain technical problems. The interior of the temple presented alterations on the shapes of structural members due to two fires in historical times. The restorer chose not to replicate the thermal fragmentation of the members. Though it is difficult to judge this decision, it should certainly be recognised that it forms an approach with respect to the surviving form of monument and without aiming at mimicking every single detail. Considering the apparent chromatic difference too, it could have been performed in a less visually dramatic way, with the surfaces of new members resembling the surfaces of the original ones.

Concerning the requirement for publications, according to Article 16 of the charter (Bouras in CCAM 1977, 27-29; Papanikolaou 1989, 2-6), the committee states that they have provided analytical information on structural and architectural issues. However, more information regarding the monument before and after the intervention and the plan that was followed is needed. The committee simply focused on providing specialised information. The principal publication (CCAM 1976-1977) includes detailed description of the state of preservation of the Erechtheion and the proposed measures for its anastylosis, but it was not found in any library. The only accessible publication is a brief summary of the original (Papanikolaou 1989). The only other published account of the anastylosis is the *Proceedings* of an international meeting held with regard to the anastylosis of the Erechtheion. This publication (CCAM 1977) is interesting and covers issues of the intervention that were extensively debated. In general, the quality of publicised information is of good standards. However, the quantity is scanty as there is not much information on the plan of the site, the undertaken works, the interpretation of the theoretical framework of the intervention, the encountered difficulties, and the overall result.

A comment that needs to be made about all the Greek case studies, regards not only the occasional unavailability of published sources, but also the information being mainly in Greek – except for the Parthenon. Although this did not cause any trouble to me, as I am a native speaker, I should acknowledge the difficulty of accessing information in a language that not everybody would be familiar with. Thus, requirements for lingual accessibility and availability of the published accounts of anastylosis should be established.

Apart from the international framework followed, some further principles were adhered to (see Bouras in CCAM 1977, 29), deriving from the Greek experience in anastylosis of classical monuments. They were formulated by the architect and restorer Charalambos Bouras, president of CCAM and member of similar committees in Greece. These principles were initially applied in the anastylosis of the Stoa of Vravron in Attica that took place immediately after the establishment of the *Venice Charter*. During the Erechtheion anastylosis they were still in the initial stage of their formulation. In their later development they evolved into five indispensable principles respected in every anastylosis in Greece. They are notably followed in most interventions to monuments internationally, but the pioneering Greek approach is that it applied them in accordance to the needs of classical monuments.

Reversibility, which permits the relatively easy dismantling of restored parts to replace them with original material, was secured with minimum intervention on original members and detailed recording (Bouras in CCAM 1977, 29). This principle is often discussed with regard to its definition. In theory, it forms a prerequisite of conservation approaches, since it guarantees future interventions. In anastylosis it permits the possible incorporation of members that may be found later. This was the rationale behind the actions of the Erechtheion restorers. Reversibility was also crucial for ensuring the possibility of re-integrating the original Caryatids back to the monument in case the problem of pollution is resolved in the future. In practice, reversibility may raise issues, such as the possibility of dismantling structural or architectural elements in order to integrate newly discovered members. But what type and amount of members would validate such action? The Caryatids certainly would, but it is quite possible that non-significant members would not justify dismantling the monument. Nevertheless, the essence of the principle is found in the theoretical possibility to reverse actions rather than its practical application.

Minimum alteration of the appearance of the monument is based on the familiarisation and knowledge of its form as preserved so far and as it appeals to collective sensitivity (Bouras in CCAM 1977, 29). It was indeed achieved (figs. 8, 11b), as the monument does not seem that much different compared to how it looked after the Balanos anastylosis. However, a certain contradiction between this principle and the aim of the restorers to alter the image of the monument as resulted from the random re-assembly of its members emerges. The restorers wished to correct the obvious mistakes of the past restoration, yet, they preserved some of these phases. They also wished to appeal to the collective memory of people who are familiar with the form of the structure as it had survived through time. The Acropolis monuments have been repeatedly restored in the 19th and 20th centuries. Their resulting form and image are related to the history, not only of the Acropolis, but of the Greek nation and of Europe too. In this regard, the universal historical significance of these monuments should not be neglected, but be equally respected. Similar is the case of the reconstructed, by Evans, palace of Knossos in Crete. Consequently, this principle should be observed in anastylosis projects undertaken in monuments previously restored. Compromise between minimum alteration of the appearance and corrections in the form of a structure should be strived at.

Anastylosis also aimed at increase of the didactic values of the Erechtheion, since visitors would be able to understand the building as fully and easily as possible (Bouras in CCAM 1977, 29). Certainly, its didactic values have been further clarified. But, as its image is not drastically altered, its didactic values are simply enhanced. However, its legibility is improved and the education provided is correct, in contrast to the results of the past anastylosis.

Concerning authenticity, the effort to remain faithful to the form and design of the monument was successful, since most members took up their structural role and historical phases were preserved. Given recent discussions on the notion, it would be reasonable to assume that it is expressed in every aspect of the existence, construction, and restoration of a monument. In this regard, variables of the authenticity of the monument can be highlighted. For instance, authenticity of materials was respected by using natural stone from the same quarries used in antiquity. Authenticity in workmanship was reflected in employing well-trained stonemasons who utilised techniques similar to the ancient ones. Regarding location and setting, the monument was restored *in situ*, in its exact location, with provisions for the site itself and its surrounding monuments. However, authenticity is an abstract and relative concept that is expressed multilaterally. Thus, it becomes almost impossible to actually assess the final result of the anastylosis in this regard.

4.1.1.2.3 Issues arising from the project

The long history of the Erechtheion includes a traumatised period due to the Greek and Turkish conflict and a series of flawed interventions at the beginning of the 20th century. Those interventions altered the form and structural stability of the monument and their catastrophic consequences demanded urgent measures. Consequently, the theoretical and technical framework of the 1970's anastylosis programme is better understood and explored.

Interestingly, the intervention was initially defined as stabilisation, due to the presented structural problems. It was clearly stated that there was less scope for restoration and anastylosis, since little ancient material could be found dispersed around the building (see Korres and Bouras 1983, 664). Yet, during the course of the works, the intervention was altered to reflect the actions of dismantling and re-assembling the randomly compiled members together with newly discovered ones (fig. 25a). Hence, the intervention was identified as anastylosis, which also comprised stabilisation of structural members, while conservation was undertaken to halt deterioration of marble surfaces due to atmospheric pollution. Obviously, no alternative treatments could have been chosen in this case.

The undertaken intervention was also described as 'restoration of a restoration' (Zambas 1994a, 107), highlighting the difference between intervening in a ruined monument and a monument previously restored. Many actions were similar to those undertaken to monuments emerging ruined from excavations. Such were the research conducted before and during the intervention, the integration of original and new material, the efforts to utilise the appropriate material for integrations and connections, the joining of members, the techniques employed, the general theoretical framework, as well as some aims sought to be achieved – static stability, enhancement of values, and improvement of legibility. The only apparent difference is that the monument had to be dismantled; hence, the intervention was quite extensive. Although this raises speculations – some were expressed in the international conference (CCAM 1977, 16) – it is the only way to correct past mistakes and remove damaging material from the structure. Besides, when the damage was not judged serious, no action was taken, signifying respect for the material and history of the monument.

In this regard, given the aims sought to be achieved, it becomes apparent that both the theoretical and technical aspects in anastylosis are linked and determine the extent of the intervention, with the most important prerequisite being the respect for the original fabric and the monument itself.

Further comments should be made about the high numbers of surfaces of new marble. A closer look at the south wall (figs. 20, 22) reveals that the amount of new material is quite excessive. This forms a great problem of architectural conservation in general, as it affects the authenticity of the form, image and structure of the monument. The quantity of new material has been extensively discussed and debated in relation to minimum interventions and anastylosis (Chapters 3, 6), yet, no absolute conclusions are reached. The Erechtheion restorer acknowledges that great amounts of new marble have been used (see Papanikolaou 1994, 147). This is obvious but it was also essential for re-assembling many original members. Here is where realism should be exercised, as every intervention to a monument will affect its authenticity and form. It would be great if ancient monuments were found either intact or with all their members surviving. But this is not possible, and, thus, a degree of compromise should be accepted when judging the results of anastylosis.

Notably, the past restorations made the recent interventions quite difficult, as ancient members were displaced, distorted by chiselling, and damaged by insertion of metal, which corroded quickly and caused further damages (Papanikolaou 1989, 1-2; 1994, 137). Past technologies proved harmful for the monument, though at the time of their application were appreciated and endorsed. This should always be taken into consideration by professionals when applying scientifically and technologically advanced methods. Yet, due to the technological advances themselves, materials can be tested to examine their future behaviour. The principle of reversibility was also established to guarantee that no further damage can be caused to the structure and that the building can return to its state prior to the intervention. Therefore, such actions should be thoroughly contemplated before implementation.

The general anastylosis strategy included extensive research before the intervention (archaeological, architectural, and structural studies on the history of the Erechtheion, its state of preservation, and its past alterations and restorations). It was based not only on physical evidence but on archival information too. Valuable information on the construction and architecture of the monument was gathered, which, in turn, led to well-informed decisions on the intervention. Hence, the importance of good quality documentation that assists in planning and implementing anastylosis should be highlighted.

Interestingly, the archaeological and architectural values of the monument were the main values taken into consideration by the committee when planning its anastylosis. Its exceptional architectural and sculptural features and its complex plan and form require preservation and elevation. However, more values should be contemplated when an intervention is decided and planned. The direction of the current restoration theories, especially through the *Burra Charter* and the Getty Conservation Institute approach, towards assessment of values should guide our anastylosis and restoration decisions. Obviously, the Erechtheion was restored many years ago, at a time when respect for the values was still developing and emphasis was paid to aesthetic and historic ones according to the *Venice Charter*.

The management plan for the site, though not found in any written form, includes care for the surroundings and for visitor accessibility, as well as maintenance works and future programmes on the monument. After completion of the works, visitors were given the possibility to approach the Erechtheion from its east and north sides, while another temporary path at the west made that side accessible too (fig. 25b).

Nowadays, visitors access all the sides and they can even ascend to the north porch. However, it is quite difficult to approach the Caryatids porch because of the dispersed members in front of it (fig. 20). The cella of the temple is not accessible, probably because the interior floor is not fully restored. A future plan includes the formulation of neutral flooring in the cella (Bouras 2002, 16-17), which would probably allow future visitor access. Additionally, the committee plans to restore all the ancient paths (see CCAM 1990, 6-7) around the building after restoration works on the Acropolis monuments are finished.

Restoration and anastylosis programmes are undertaken in the Parthenon, the temple of Athena Nike (fig. 6), the Propylaea (fig. 7), and some smaller monuments of the Acropolis (Fatouros in Economakis 1994, 186). Although the Erechtheion anastylosis took place long ago, it is understandable that a great site like the Acropolis requires a well-informed management plan, which will take years to implement. The management of the site seems to be devised as time goes by, rather than having been outlined in the beginning. Both options are significant, since decisions or modifications can take place depending on information acquired through time and according to the latest theories of heritage management.

Additionally, further works have been planned for the future, indicating that anastylosis does not necessarily stop after the basic works are completed. The plan for restoring the floor of the cella is quite extensive and will alter the image of the interior. It can be justified, though, if it is planned with a view to provide access to the public and protect the unearthed phases of the history of the monument. Similar is the speculation over the restoration of the roof of the north side that is planned for protecting the porch against the rain. Yet, the issue of restoring roofs is quite sensitive, as it will be shown in the Parthenon and in the Avaton of Epidauros. The incorporation of a structural part made of entirely new material, as the original material may be lacking, raises questions on the authentic form of the monument.

Maintenance work is also currently undertaken and involves conservation of the lower parts of the side walls and systematic conservation of marble surfaces. This is a significant action. Initially, it confirms that anastylosis may entail active conservation, not only before the actual intervention, but even afterwards, for ensuring the stability and durability of members. In addition, it highlights the importance of maintenance planning so that anastylosis can have the desirable effects in the long-term. Hence, it becomes important to include anastylosis in the wider field of heritage management and conservation.

The final result of this anastylosis is difficult to judge. According to a particular professional, it is unsuccessful, since the monument is neither a comprehensible building nor a romantic ruin (see CCAM 1994b, 210). However, it would be unfair to criticise the end result so harshly. As the restorer of the monument explains, every intervention is an ambiguous action and public opinion can view it with criticism and doubt, especially in monuments with great historical and artistic value (Papanikolaou 1985, 5). The monument has great values attached to it, and indeed any intervention should be carefully and strictly judged. Criticism should always be done in ways in which it can be constructive, so that past experiences can teach us lessons in improving the methods with which anastylosis is implemented. The Erechtheion is surely neither a ruin nor a complete monument. Its anastylosis indicates how it looked in its prime time. Diverse issues have been raised but in total the restorers have done their best to stabilise a monument suffering from past restorations and enhance it through anastylosis.

4.1.2 The Parthenon

The Parthenon (447-433/2 BC) was a monument to the Athenian power. It is a Doric temple incorporating Ionic elements (figs. 28, 53-56) and with exquisite architectural refinements and sculptural decoration. Since antiquity, it has survived many vicissitudes from earthquakes, fires, historical interventions and repairs, including transformations into a Christian basilica, a Turkish mosque, and a gunpowder arsenal, as well as extensive restorations.

In 1975 the CCAM undertook responsibility for the monument, after realising the necessity of intervention. Its form in 1983 (fig. 30) was acquired after restoration in the first half of the 20th century by Balanos (fig. 29) and the 1981 earthquake (fig. 31). Quantitative preservation was greater than in most ancient temples. Qualitative preservation presented problems due to gravity, environmental temperature, wind, water, microscopic organisations, vegetation, and expansion of metal joints (figs. 32-36). The east side of the temple was preserved in its original form, with deformations by the 1980's earthquake (fig. 31a). The west side was relatively well-preserved (fig. 31b). The north side had been extensively restored while small-scale restorations had been undertaken on the south side. Parts of the original ceiling survived in the west colonnade. The crepis was preserved throughout and the floors of the colonnade, the pronaos and the opisthonaos survived almost complete.

4.1.2.1 The anastylosis programme

The anastylosis programme began in 1986 and is still in progress. It is methodologically divided so as to correspond with demands concerning removal of deterioration causes, better conservation, and enhancement of values.

Proposals to remove deterioration causes include dismantling of restored parts (fig. 39) to extract the oxidised and expanded metal components (figs. 32, 33, 41a), which are documented and preserved in a museum. Shifted members are repositioned correctly (figs. 37, 44, 45). Improved conservation emphasises the choice of durable and compatible material, such as titanium alloys (fig. 43) and Pentelic marble (figs. 40-42). The works include restoration and consolidation of stone members and surfaces (fig. 46c), studies on earthquake protection, and organisation of dispersed material that will not be re-assembled (figs. 46a, b). Traditional or modern devices are used for cutting and working new marble blocks (figs. 52a, b). An electric pantograph replicates forms in marble (figs. 52c, d). Proposals for improving the values of the monument encompass minimum interference with ancient material, incorporation of surviving dispersed material, and correction of errors of earlier restorations. They aim at ensuring conservation and structural stability and at enhancing educational values (Bouras 1983c, 404; 1983d, 414-418; Korres 1994d, 123; Zambas 1989, 155-159).

Research studies include examination of structural problems and the earthquake resistance of the building; exploration of the quantitative preservation of stones; laboratory experimentation for conservation of members and production of artificial patina and mortars suitable for use on the marble; archaeological and architectural research; development of computer programmes to determine the original location of surviving elements; documentation systems for codifying stone members; and surface conservation matters (Kalligas in CCAM 1995, 28; Korres 1983d, 233-234; 1994a, 175-179; 1994d, 113; Korres and Bouras 1983, 2; Papakonstantinou and Frantzikinaki 2003, 87; Skoulikidis 2003, 57; Skoulikidis *et al.* 1989, 181-219; Varoufakis 1992; Zambas 1985, 127-144; 1989, 153-180; 2002b, 227).

For organisational reasons the programme is divided in twelve stages (figs. 53-56) that correspond to a logical division of the parts of the building. The greater part of them is now complete. The work-site is organised according to the time and space arrangement of the programmes (figs. 38, 47-51) (Bouras and Zambas 2001, 35; Casanaki and Mallouchou 1985, 82; Korres 1983e, 501-514; 1994d, 119-124; Korres and Bouras 1983, 2; Paraschi and Toganidis 2002, 17; Touloupa 1985, 9).

4.1.2.1 Observations and discussion

4.1.2.1.1 Analysis of objectives, and whether or not they were met

The objectives focus on eliminating the deterioration causes and improving conservation (figs. 32-36) of the building. Both aims are related to problems presented by past restorations, atmospheric pollution, visitor wear, fires, earthquakes, and natural ageing (Casanaki and Mallouchou 1985, 82; Bouras 1983c, 401-405; 1985b, 87-89). Through the work that has been completed so far, it can be concluded that the objectives seem to be achieved. As the Erechtheion suffered from the harmful materials of the past anastylosis, so did the Parthenon. Parts of the monument are dismantled in order to extract the damaging material and consolidate them, amending the incurring damages. Visitors are not allowed anymore inside the building, so excessive wear has stopped. Obviously, until the entire anastylosis programme is complete, it will not be clear whether these two aims have been accomplished, but some indications from the completed works show their possible future achievement.

Anastylosis also aims at enhancing the historical, archaeological, scientific, artistic, and functional values of the monument (Casanaki and Mallouchou 1985, 82; Bouras 1983c, 401-405; 1985b, 87-89). It is more difficult to identify whether this objective has been fulfilled, simply because the works are still in progress and any judgements are only indicative and not conclusive. The values that will certainly be enhanced with anastylosis are the historical, archaeological and scientific ones, since the extensive research, undertaken before and during the interventions, reveals them and anastylosis cannot but annotate them. However, an inconsistency should be noted. A participant in one of the international conferences (Drosogianni in CCAM 1995, 246) stated that there is a seeming absence of a study about the Byzantine wall paintings, traces of which were found in the Parthenon, even though the committee affirmed the conduct of these studies (CCAM 1995, 247). Since respect towards the surviving traces of the later history of the monument is growing, their examination and preservation should be more systematic. Many historical phases of the Parthenon were obliterated during the past anastylosis; for instance, the remains of the mosque in the cella were removed in the mid-19th century. At that time, though, restoration of the Parthenon was related to the revival of Hellenic culture, thus, historic values concentrated in the existence of the monument as the exceptional conception of classical civilisation.

Additionally, the enhancement of the artistic and the functioning values of the monument can only be judged after all works are completed, though some preliminary assessments will be made later on.

Two factors in deciding anastylosis are the experience gained from Erechtheion and the maturing of opinions (Bouras 1983c, 401). This experience certainly assisted in understanding how to resolve the problems presented in the Parthenon and in highlighting past mistakes. Thus, the intervention was further advanced while enhanced by the development of opinions through time and technological advances.

In general, it is quite difficult to reach a certain conclusion about whether the objectives of the restorers have been met, since the anastylosis is not complete yet.

4.1.2.1.2 Theoretical framework of the anastylosis works

The *Venice Charter* is the principal theoretical guide. As mentioned before, it forms the basic framework of anastylosis works undertaken in classical monuments in Greece. It was about twenty years after its establishment that was adopted in the Parthenon anastylosis, which indicates its growing influence, despite doubts regarding its effectiveness in the 1970's (see Chapter 3). As the works have not finished yet and the theoretical framework for anastylosis is still evolving, the validity of the Charter is proven once more. It should be noted, though, that the charter is not followed without speculation. The president of the CCAM acknowledges relativity in observing its principles and consequent free interpretation of its articles (Bouras 1983b, 407; 1985b, 90) to make them more applicable to the anastylosis of the specific monument.

The multidisciplinary character of the interventions, according to the interpretation of Article 2 of the charter (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90), is reflected in the two committees that undertake the anastylosis. The main group of professionals (CCAM) is responsible for the theoretical guidance of the works and the second one (SRAM) undertakes the technical implementation. The synthesis of CCAM and the working groups has been analytically discussed in the Erechtheion. SRAM consists of architects, archaeologists, civil and mechanical engineers, chemical engineers, conservators, stonemasons, draughtsmen, photographers, secretaries and accountants. Thus, a wide range of specialists are involved, focusing solely on this project. Special note should be made of the civil and structural engineering disciplines whose input in this anastylosis proves more than necessary. Intensive engineering studies are undertaken in order to establish the stability of the structure and its capability of withstanding various forces, as well as in order to examine the durability of materials. These studies are developed further and are more analytical than in the Erechtheion, probably because of time and the specific needs of the Parthenon.

The institution of international conferences instigates participation of many disciplines that contribute with their comments and suggestions to the decision-making. So far, six conferences related to the anastylosis works on the Acropolis monuments have been conducted. Quite often it depends on the opinions of the participants whether the preliminary studies will go forward (see Bouras in CCAM 1985, 195). Fruitful discussions and debates advance the approaches, by exercising criticism and embracing efforts. Distribution of questionnaires about certain issues, in two conferences, indicated the Committee's seriousness to place its work under the critical eye of experts and resolve problematic matters. Co-operation of experts is intensive, since laboratories in Greece and abroad collaborate on multiple conservation issues (see Skoulikidis in CCAM 1985, 203).

The aim at improving the values of the monument is in accordance with Article 3 of the charter (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90) and has been discussed above. However, not much discussion of values takes place, although it is acknowledged by the committee (see Bouras 1994b, 102-103) that their systematic analysis leads to better understanding of the monument itself and the ways in which it can be preserved and presented to current and future generations.

Interestingly, though, some identified values of the monument, specifically, its social role and educational potential, are characterised as functioning. Education for both scholars and visitors is given particular attention, as legibility is improved and the potential to study the monument is provided through its restoration to those interested. It is in this sense that the '*socialisation*' of the Parthenon is achieved (Bouras 1983c, 401-405; 1985b, 88-89). Projection of the social role of the Parthenon highlights the current approaches of making ancient monuments part of the activities and interests of the people. This is a remarkable approach to anastylosis, as it contextualises it under the idea that educational values are interrelated with social and cultural ones. Education is not perceived *per se* but as having wider implications by relating the monuments with the society and its needs.

Respect for the decoration of the Parthenon and care for preserving its setting are in accordance to Articles 5 and 6 respectively (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). Article 5 refers to making the monument useful for some social purpose without proceeding in modifying its layout or decoration. This does not relate much to the undertaken intervention. The ability of the restored monument to educate people and become part of their everyday life is regarded as its social purpose. There are no plans for using the Parthenon for any activities, apart from visitation. The social purpose refers to its symbolism and how this is going to affect the public. Hence, no actual question on altering its layout or decoration is posed.

Respect for the setting of the Parthenon is shown in caring for the entire site. Anastylosis programmes have been or are currently undertaken in the main monuments of the site (figs. 6-8), together with selective restoration of secondary edifices. The Acropolis rock is consolidated (fig. 61). Approximate re-establishment of the ancient paths is undertaken (fig. 62). Architectural and structural members and fragments are arranged and kept protected from adverse weather conditions in areas not impeding visitor circulation around the site (figs. 46, 65). The organisation of the work-site was designed in a way that it does not obscure the building with huge equipment while work is in progress, visitor movement is not obstructed, and the presence of foreign structures is aesthetically tolerable (see Korres 1983e, 513; 1985, 115; 1994d, 119; Touloupa 1985, 9).

Another aspect of the theoretical methodology concerns the removal of *in situ* sculptures, in accordance to Article 8 of the *Venice Charter* (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). Removal of some architectural sculptures from the Parthenon (figs. 57, 58) was a solution undertaken after examining all other possibilities, such as either leaving them to deteriorate under the atmospheric pollution or hiding them behind thick glass *in situ*. The first alternative would not have been the best way to resolve the problem as deterioration is what architectural conservation strives to tackle. The addition of other structures (glass) on the monument would affect its form, its authenticity, and its aesthetic appearance. Due to the high levels of atmospheric pollution in Athens, removal of sculptural elements seems the only acceptable solution. This naturally raises various issues. Firstly, atmospheric pollution is a main deterioration reason. Interventions cannot address the environment and this problem continues to exist. It is considered a 'political problem' that needs to be addressed by archaeologists, architects, and restorers in order to find a sustainable solution with regard to the environment (Haselberger in CCAM 1995, 219). Realistically, this kind of action may not have an impact on the relevant legislation and undertaken measures, but it may influence decisions.

In addition, the removal of sculptures necessitated their replacement with copies. Suggestions focused on casts, either from marble or artificial stone, or on schematic flat plaques (CCAM 1985, 198-200; CCAM 1995, 200-223). The final decision concluded in cast copies. Their incorporation was decided for reasons of structural stability, since most removed elements are architectural members too, as well as for not diminishing the educational values of the monument. Objections in the international conferences were intense. Arguments expressed speculation over sacrificing authenticity by extensive incorporation of new material (Dimacopoulos in CCAM 1985, 192) and over falsifying the monument by introducing stage scenery that would superimpose the ruin (Dontas in CCAM 1985, 197; Papageorgiou-Venetas in CCAM 1990, 144). The authenticity of the monument in relation to the amount of new material incorporated in the monument for structural or other reasons is discussed below. The creation of the so-called 'stage décor' is a matter that needs painstaking thought. Addition of sculpted copies (figs. 53c, 54b, 55, 56c) does not necessarily diminish the aesthetic appearance of the monument. Looking closely at it, it is difficult to distinguish between original and copied sculpted members. Since most copies appear at height, mainly in the frieze, and skilled stonemasons are employed, the possibility of noted inaccuracies is almost non-existent. However, the best solution should derive from thorough studies, such as those undertaken in this case, and visitor studies too, so as to identify the public opinion, given that the educational value of the monument is addressed to the public. But visitor studies were not carried out. Furthermore, lucid information on the fact that these elements are copies would erase the danger of misunderstanding by the viewers. But the amount and type of information is not known as the works have not finished. The choice to keep the removed sculptures in the Acropolis museum is exceptionally important so as not to be deprived of their context. The museum is found within the site and the new one will be quite close too.

Article 9 of the charter is adhered to by respecting the original form and features of members and by avoiding new work on them (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). Indeed, the ancient material is respected since no new points are created for joining new and original members and the ancient cuttings are used; members found in wrong locations are correctly repositioned; there is minimum interference with the ancient material, as far as the required consolidation allows it. Respect for the original form of the monument is ensured by long-term research – a broad range of studies is conducted – which aims at acquisition of exhaustive knowledge of the architecture and structure of the building, in order to preserve them without alterations or falsifications.

Article 10 of the charter is fully respected (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90), similarly to the Erechtheion anastylosis, by employing new and traditional techniques and by using both modern and traditional tools for working on the marble. This confirms that all kinds of methods and techniques are used to achieve the best possible results.

Article 11 of the charter is also respected (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). Restorers declare their faithful following of the image and form of the monument, as it has survived through time. This is confirmed by a further principle adopted in this anastylosis, which asserts the keeping of the changes in the appearance of the building to the minimum. So far, its image has not altered significantly (figs. 53-56, 59), similarly to the Erechtheion. However, suggestions about restoring the roof over the west wing spark questions about the kind of protection that will be achieved and the extent of the intervention. Arguments for its restoration focus on enhancing architectural and aesthetic values, since original material exists and has been prepared for assembly by previous restorers, and on achieving protection against weather conditions (Hueber in CCAM 1995, 229; Korres in CCAM 1995, 204-206). But if this intervention is undertaken, then the form of the monument will change dramatically, no matter what the benefits will be.

Another issue refers to the harmoniously integrating, yet differentiating new from original members on the building, in accordance to Article 12 (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). This is achieved, according to the restorers, with inscribing the anastylosis date on the new members (fig. 63). This method assists future researchers and restorers to correctly identify which parts of the structure derive from the recent anastylosis. However, this action does not resolve the issue of differentiation, as far as the image of the monument and its understanding by the public are concerned. No other adopted method of differentiation is mentioned, even though the contrast between new and original members will be quite obvious. In this sense, the restorers hope that the passage of time or the application of artificial patina will eliminate the differentiation (see Bouras and Zambas 2001, 16; Skoulikidis 1994b, 33-34). Concerns with regard to setting the new material with the white surfaces alongside the coloured and weathered surfaces of surviving marbles emerge (CCAM 1990, 133-134). So far, not much chromatic difference, especially in the external colonnades and the internal walls, is noted, only colour differentiation in the column drums in the internal colonnades (figs. 53b, c, 66b, 67). Since the works are not completed yet, it is impossible to make final judgements. In general, there are no striking differentiations, such as those appearing in the Erechtheion. Of course, the option of artificial patina seems to be a good solution. It does not necessarily falsify the truth of the monument, as the intervention itself is the first to falsify it. Yet, artificial patina should not attempt to faithfully imitate the patina of age of surviving members; it should rather be carefully produced, its results should be checked before the final application; and it should be made clear that it has been applied. If all these prerequisites are fulfilled, then it becomes a reasonable choice that achieves harmonious integration and slight differentiation of integrations. The opposing argument that with time, artificial patina will be similar to the original one (see CCAM 1990, 133-134), is valid, but plenty more options can be employed in combination to guarantee differentiation.

Another point to be made regards Article 15 of the charter and the restorers declaring that the interventions on the Parthenon are in accordance to the international definition of *anastylosis* (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). Similarly to the Erechtheion, the programme was initially planned with the aim of saving the monument from further damage and improving its conservation. After initiation of the works, it was decided that anastylosis would increase the static stability and legibility of the monument (see Bouras and Zambas 2001, 7). The original plans were modified, especially since many members had to be dismantled and repositioned and more surviving members were recovered from excavations in the surrounding area. Thus, the definition of anastylosis by the Parthenon restorers agrees with the international definition of the term. Yet, the undertaken interventions include conservation of surfaces, stabilisation, and more, while the monument is neither ruined nor deriving from an excavation – as specified in the charter; it is a monument standing since antiquity and having suffered damages and alterations due to time and previous restoration efforts.

Vast amounts of publications and documentation were produced in the past regarding the Parthenon and are followed up by extensive publications of archaeological and architectural research undertaken recently, which form the basis of the development and implementation of the anastylosis study. This large amount of published studies initiates with an exhaustive publication (Korres and Bouras 1983) that analytically describes the architecture, construction, and history of the monument and outlines the anastylosis programmes, followed by many more others (Korres 1989a; 1994b; Korres *et al.* 1989; Koufopoulos 1994; Papakonstantinou *et al.*2002; Paraschi and Toganidis 2002; Skoulikidis *et al.*1994; Toganidis 1994; Zambas 1994b). Publication of the scientific studies and proposals for the twelve anastylosis programmes is a prerequisite for any undertaken work. It results in providing transparency of the works and time to interested scholars to study and comment on the interventions. Preliminary and final studies are published every year. They are all technical and meticulous, including summaries in English, in an effort to facilitate access to information for foreign scholars. By the end of the anastylosis, it is guaranteed that documentation will be more than exhaustive. The proceedings of the international conferences are published too, providing an exceptional insight into the works, the constructive criticism, and the spirit under which these meetings are conducted.

The extensive documentation and publications are in accordance with the relevant requirement in Article 16 of the *Venice Charter* (Bouras 1983b, 407-411; 1985b, 91-93; 1994b, 89-90). These publications are easily accessible throughout academic libraries. Creation of an archive would be the final step towards this huge accumulation of information. However, so far no such action seems to be considered.

Further principles complete the *Venice Charter* by referring to the special needs of classical monuments. Such are: reversibility of interventions, preservation of the autonomy of members and their static function, keeping changes in the appearance of the monument to a minimum, respecting the past restoration as a historical event, and restricting operations to already restored parts (Bouras 1983b, 407-412; 1985b, 90-94; 1994b, 91; CCAM 1994b, 186-187). The last three are followed in the anastylosis programme of the Erechtheion too and have been discussed above. They are all particularly important in monuments previously restored.

Respect of the past restoration as a historical event is directly connected with the idea of not altering the image of the monument (Bouras 1983b, 407-412; 1994b, 91). In this regard, though, the monument will not acquire the state it had before the 1687 explosion but the form it had after the anastylosis of Balanos. The Parthenon forms a symbol of classical civilisation and has been depicted in numerous photographs, books, posters, and copied structures. Alteration of its image may come to symbolise alteration in its history and character. However, a CCAM member comments that 'the proposed anastylosis never aimed at restoring the Parthenon to one of its past phases. The restoration will effect a new configuration, which will depend on the extent of our capabilities' (Korres in CCAM 1985, 196). Hence, no absolute respect can be achieved, making the above principle a relative concept.

The principle related to preserving the autonomy of architectural members and their static function, which, in turn, leads to self-preservation of the ruin, derives from observation and study of the architecture of classical monuments. As these monuments were erected with pieces of stone or marble, connected to each other with little or no mortar and with small metallic joints (see Chapter 3), their members preserve their autonomy and constitute 'existing but dismembered parts' that can be re-integrated and repositioned (Dimacopoulos 1985, 18). Past examples that proved unsuccessful in the long-term were those that altered the static system. In this regard, the principle can be applied in anastylosis of these specific structures. Its significance lies in preserving the structural stability and the authenticity of the structure and design of the monument.

In the Parthenon, great emphasis is placed upon the principle of reversibility. Speculations focused on its clarification as a guiding principle and the 'security' it 'guarantees' in interventions (CCAM 1985, 195 and 205), highlighting its significance and potential attainability. As discussed before, reversibility is attainable, given minimum interventions and detailed recording of the works. Yet, it remains a principle that cannot be accurately defined. Its relativity reminds us of similar restoration principles, such as the respect for the values of the monument, which can be perceived differently by experts and by the public. Efforts for achieving reversible interventions are certainly more encouraging rather than overlooking the matter, because reversibility cannot be properly defined or because it is doubtful whether it ensures non-damaging interventions.

However, arguments, such as reversibility may possibly lead to multiplying the extent of intervention (CCAM 1985, 191-192; 1990, 166), should not be ignored. Extending the intervention simply because there will be possibilities of reversing the undertaken actions forms dangerous ground. Reversibility should be strongly linked with minimum interventions, since our aim is to intervene without affecting the authenticity and without altering the image of a monument, especially if it has been restored in the past. The essence of reversibility is found in the ability to reverse the anastylosis and return the monument to its previous state, due to respect for the authentic documents of the past. If the undertaken interventions can be reversed, then changes can be made for the benefit of the monument.

4.1.2.1.3 Issues arising from the project

Issues discussed in the Erechtheion with regard to past interventions and their catastrophic results are similar in the Parthenon, as the previous restorations were undertaken by the same people, in similar times, employing the same methodologies. Differences and similarities in the current restoration approaches to the Parthenon and the Erechtheion are noted too. Similarities are because the same body (CCAM) is responsible for both monuments. Differences emerge due to time, the evolution of restoration theories and principles, and the development of modern technology. Moreover, despite both temples being part of the monumental Acropolis complex, the Parthenon forms the national monument of Greece; hence, symbolic meanings are attached to it, justifying the abundance of time and care for its anastylosis.

However, it would be expected to decide, plan and implement anastylosis in the framework of a conservation and management plan, but is not certainly known whether such a plan exists for the Acropolis. From personal communication with people who have worked in the archaeological sector in Greece it was revealed that such plans exist but it is difficult to access them. They are kept into the archives of relevant services or committees but they are not referred to in any publication regarding the site in question. Aspects of a management plan for the Parthenon are revealed through actions linked with its anastylosis and with providing for the site of the Acropolis, as discussed above (4.1.2.1.1). Further observations and comments on their effectiveness and their provisions for the future will be discussed below. Such arrangements would not be as carefully thought-out, had they not been part of a management plan. However, a management plan is the absolute guide in our intervention to a monument and a site, and it should be available to everybody interested, as this also forms means for transparency and for extracting constructive criticism on its effectiveness.

The reason why anastylosis was chosen relates probably to the fact that the decision on the kind of work necessary for the monument constituted anastylosis according to its international definition. Members already re-assembled on the monument had to be correctly repositioned, while more parts were discovered and could be re-integrated. Additionally, the choice was based on the fact that anastylosis had already been implemented on the Erechtheion, a monument with similar structural characteristics and presenting similar problems to the Parthenon. Alternative treatments that could have been chosen were probably rejected, because the decision on anastylosis emerged after examining the requirements of the monument and the need for its structural stability, as well as because further original material was discovered. Anastylosis was also chosen in order to enhance the values of the monument and improve its conservation state.

However, issues raised from the educational values of monuments regard the effect they have in the extent of the intervention and the alternative ways in which they can be enhanced. In architectural conservation and restoration, education and improvement of legibility are projected as strong motivations. Even though this is considered acceptable, it is also debated how much these incentives should affect decisions on the manner in which an intervention is implemented. Obviously, by restoring a ruined or unintelligible monument its educational values are improved and the visitors learn more about ancient architecture and archaeology. The situation becomes worse in cases where education is wrongly projected to justify extensive interventions in an era when restoration theories strongly advocate minimum interventions and favour respect for the authenticity of monuments. This is exactly the source of the dilemma for the Parthenon and the other Acropolis monuments. The main aim should become the compromise between enhancing educational values and respecting the authenticity and character of the monument as it has survived over time.

In this regard, questions are voiced about how education should be achieved. Many professionals suggest other means, such as models, perspective drawings, and descriptions (see Papageorgiou-Venetas in CCAM 1990, 145; Dontas in CCAM 1994b, 196-197). Yet, the Acropolis Committee replies that 'models and drawings cannot recreate the direct experience of space or of the perfection of details' (Bouras in CCAM 1994b, 185). This is why, a compromise should be sought, and a combination of solutions, such as minimum intervention with well thought-out explanatory material, should be adopted in order to satisfy the needs of visitors, of scholars, and of the monument itself. This compromise forms an efficient way to accommodate the need for interventions and to achieve education without resorting to extensive anastylosis.

In addition, this matter that is directly connected with the social role of monuments and the educational potential inherent in tourist activities should be the subject study of experts from the heritage education and visitor studies field. Interestingly, it is admitted that 'figures from social studies and polls, which might throw some light on these issues, lack' (Bouras in CCAM 1994b, 185). It is worth wondering why they lack and why there are no provisions to make informed decisions by consulting the visitors and exploring their views. This anastylosis project is characterised by and praised for its multidisciplinary approaches. However, social scientists, education specialists, and heritage experts are involved only in producing relevant information and not in the decision-making. Given the significance of the Parthenon as a national and international symbol of classical antiquity, this seems to be an unwise lack of means and consideration for both the monument and the public.

The Parthenon is also considered a *social monument* (Bouras 1983c, 401-405; 1985b, 88-89). By attaining this social character, it is transferred to the realm of living monuments. However, according to the distinction between *dead and living monuments*, which was used to determine the extent of intervention to them, the Parthenon can be identified as a non-living monument. It is not used anymore as a place of worship, in other words according to its original function. Still, it is a living monument as it continues to exist in a material form and reflect values of history, art, and culture for people. It is in this regard, that the concept of dead monuments is no longer applicable, but every monument is considered to have a social character, being part of the society and its daily life.

Tourism is a significant driving force in anastylosis activities throughout the Mediterranean, since all countries of the region rely heavily on tourism for revenue. Yet, tourism is rarely acknowledged as a factor influencing decisions, probably because of its negative connotations. This appears to be the case for the Parthenon (fig. 60b). The Acropolis of Athens is the most visited site in Greece, as it is located in the heart of the capital and symbolises the classical civilisation, which is considered the basis of western civilisation. However, nobody admits that tourism instigated decisions on the anastylosis and its extent. Emphasis placed on the educational values of the monument and the need for its *socialisation* implies that tourism has been influential enough on the undertaken anastylosis.

National identity as a driving force becomes an important issue that needs to be further discussed. It does not necessarily mean that the impact of national identity is viewed in a negative light. All driving forces are influential in management and conservation decision-making, but they have often been abused. Thus, nowadays, any reference to national identity is perceived doubtfully regarding its intention. The Acropolis monuments carry a long history, ever since the 5th century BC. They document the history of the Greek nation. The role of national identity is not overlooked either by the committee itself or by various experts, who suggest that the history and symbolisms should be respected, without concealing the different ways in which historical events set their mark on this eminent monument (see CCAM 1985, 194; 1990, 109 and 121; 1995, 222; 2003, 442). Anastylosis decided on the basis of the national symbolism of the Parthenon is not undertaken with a nationalistic viewpoint. The only impact of this symbolism is the amount of time, effort, and money spent on the monument in comparison to other Greek classical monuments. The current anastylosis does not impose one particular period of the life of the monument. The represented period is the classical one simply because of the abundance of its surviving elements and image. In addition, as Papageorgiou-Venetas (in CCAM 1990, 142-143) explains, the 19th century restorative vision of the Acropolis monuments eliminated most of their history, such as the remains of a mosque inside the Parthenon and of a Christian apse. This history is missing now and, hence, it cannot be restored. But that vision is entirely absent at this time.

The extensive research undertaken should be praised, as it resulted in the acquisition of thorough and comprehensive knowledge of the monument. Such studies are self-evident in their importance for anastylosis – they have already been discussed in the Erechtheion. The advances of modern technology and the emergence of new disciplines and fields contribute too to building up knowledge and assisting in successful undertakings. As stated by a committee member: 'the relation between study and research is a basic characteristic of restoration works' (Zambas 2002b, 11).

Part of the above-mentioned research is related to the analytical examination of the qualitative and quantitative state of preservation of the structure, including the deterioration causes and their effects (see Korres 1983d, 249-254; 1985, 103-111). It is more detailed and thorough in comparison to that of the Erechtheion. Percentages of surviving members are given in detail, being distinguished in terms of surface and volume. They are compared with numbers of surviving elements, surviving heights, and estimated dimensions. Yet, as a committee member specifies, there is always a difference between quantity and percentage (see Korres in CCAM 2003, 451), which makes it hard to establish amounts of surviving material lucidly. Nevertheless, every effort at identifying the quantity and quality of original material provides concrete information and leads to well-informed decisions on introducing new material for structural reasons only, since reasons such as education and improvement of legibility are an entirely different matter. Nonetheless, not much information is provided with regard to the amount of new material, especially since the interventions were criticised for their excess (see CCAM 1985, 189 and 194).

Indeed, the interventions do not seem moderate, as great amounts of material need to be dismantled, conserved and repositioned, while further discovered members are re-assembled (figs. 64, 66). At the same time, a considerable quantity of surviving material had to be dismantled from the monument and transferred to the museum for better protection. All this material is or will be replaced by copies. As a consequence, it is understood that the monument is under strain because of the introduced new material. The committee argues that 'no limits are set by the *Venice Charter* to the proportion of new material that can be added' (Bouras 1983b, 410; 1985b, 92). The amount of new material that can be incorporated in a monument is under constant discussion in anastylosis. Agreement about whether such limits should exist in numbers and what these numbers should be does not exist, although everybody projects the importance of minimum interventions. Surely, setting limits for the extent to which we can intervene to a monument contributes to achieving minimum interventions. Theoretical principles should be followed by some technical guidance, because, despite the magnitude of theory, many aspects of anastylosis depend on technical matters.

Additionally, the incorporation of scattered material raises questions about how desirable or effective such actions are, because a large proportion of original faces or surfaces may be lost or because they remain unidentified. Of course, it is not easy to discuss in technical terms the amount of volume and surface lost in dispersed members and fragments, since architects should be the ones to make these judgements. The architectural conservation community represented in the Acropolis conferences appears divided on the matter. On the one hand, introduction of non-identified members in random locations is considered to render the intervention a reconstruction (Hueber in CCAM 1995, 221-222), while their safe storage would be the ideal solution (Mainstone in CCAM 1994b, 202). Conversely, Hoepfner (in CCAM 1995, 207) declares that if unidentified members remain on the ground, they prove entirely useless. However, it would probably be best to explore whether such decisions can be taken, after examination of these fragments and their state of preservation. Estimation of how much new material is needed for their re-assembly could be determinative in the decision on the use of the fragment. Speculations on the final result and the authenticity of material and form of the monument are essential for deciding upon the best solution.

The relation between the values of the Parthenon and the responsibility borne by the two committees is projected as a strong argument in favour of extensive interventions: 'this responsibility should not make us supporters of the passive stance towards preservation' (Bouras 1983c, 401). This could be considered a radical attitude, as it seems to entail that the greater the monument and the responsibility, the more extensive intervention. Yet, anastylosis should be planned and implemented with the utmost degree of consideration and care. The extent of intervention seems great in the Parthenon and relevant doubts are often expressed from many professionals of the two committees, as well as nationally and internationally.

Generally, it is difficult to judge whether the implementation of the anastylosis is in absolute agreement with the proposed interventions, since the works are not complete yet. Looking at pictures of damaged elements, the description of their state of preservation is perfectly visualised. Many of the programmes are still in progress, hence, it becomes complex to check every single element. We need to rely on the description and the information provided by the restorers. For the completed programmes, the same is valid. What we can certainly acknowledge is that the form of the monument has not changed, especially if we compare photographs of the Parthenon before and after the recent anastylosis.

An imperative issue raised in every anastylosis is authenticity. As discussed previously, the concept of authenticity is quite relative; therefore any of its aspects can be examined as two different sides of the same coin. For instance, the use of all available surviving material is in accordance with respect for the authenticity of the material. Yet, if the state of preservation of the original members is poor and conservation and additions so that elements re-acquire their form are needed, then authenticity may become more relative and doubtful. In this sense, extensive interventions affect the authenticity of a monument. This is why the latest restoration theories favour minimum interventions. The authenticity of a monument is also reflected in the way and the form in which it has survived through time. This is what the anastylosis of the Parthenon and the Erechtheion aims at. In addition, authenticity is affected by removing original material and replacing it with copies. This issue is of great significance here, as many sculptural and architectural elements are removed in order to be conserved and preserved in an environment less harmful than the polluted atmosphere of the city. Introduction of extensive amounts of new material, for whichever reasons, affects authenticity as well, giving way to discussions and speculations by restorers as to the best possible way of introducing new elements without falsifying the so-called truth of the monument. Authenticity is also expressed in the original structural system of the building. In the Parthenon, comments have been made about the importance of preserving the authenticity of the monument, rather than its original form (Lavvas in CCAM 2003, 453-454). What is conclusively understood is that the concept of authenticity is indeed relative and that each action needs painstaking thought and consideration of its result. There are no rights and wrongs in achieving authenticity, since it is difficult to define it. Yet, carefully planned interventions can preserve the originality of the monument, either in its form, material, or any other aspect that may be identified.

Another aspect about this anastylosis regards the organisation of the work-site. It is impressive in that it takes into account criteria of time, space, economy, less obstruction in terms of appearance and care for the safety of both visitors and personnel. It is quite obvious and obstructive in a way, but that is understandable since the project lasts a long period of time. However, the organisation of the work-site covers a wide variety of aspects and it is outlined as an individual part of the anastylosis study. This practice is rarely noted in other case studies. Considerations about organising the work-site are common, but guidelines and the establishment of criteria for its planning are not expressed. However, they are important for accommodating visitors and personnel, as well as the conduct of the works.

Computer technology is extensively employed and multiple programmes have been developed either for documentation purposes or for determining the correct position of structural blocks and scattered fragments (see Harrington 1995, 50). Further suggestions have been expressed for using computer technology to simulate and test restoration plans before putting them to action (see Seki in CCAM 1990, 241). The Sagalassos project, as it will be shown in the following chapter (5.3), employs computer visualisation techniques with satisfactory results. Given the latest advances in computer technologies, similar applications could improve anastylosis interventions, since it will become possible to test matching fragments, assess the need for new material, and examine the result of its introduction.

Regarding the provision of information to the public, a simple notice board (fig. 60a), near the Parthenon, briefly outlines the history of the monument, from its erection to its current anastylosis. Nonetheless, it offers limited information and definitely does not accommodate the needs of the interested public. CCAM produces educational programmes and material for schools, delivers seminars to universities, organises special events, conferences, and exhibitions. Although not much information exists with regard to the visiting public and their preferences, these steps advance the process of informing those interested.

Finally, the advantages of the undertaken anastylosis are found in: eliminating the deterioration and improving the state of conservation of the structure; conducting extensive research and, thus, enriching the knowledge of the monument; employing multiple disciplines for planning and implementing the works, hence advancing research on anastylosis methods and techniques; improving the legibility and the education potential of the Parthenon, as well as in enhancing its. Disadvantages are found in extending the degree of intervention and affecting the authenticity of the monument by projecting educational reasons. Additionally, possible efforts to promote tourism activities may not be directly acknowledged and, thus, their impact cannot be assessed.

4.2 The Avaton or Enkoimeterion and the Propylon of the Gymnasium in the Sanctuary of Asklepios at Epidauros

The monuments of the sanctuary of Epidauros (figs. 68-70) show many examples of anastylosis. This study focuses on the Avaton and the Propylon of the Gymnasium. Their history is given in Appendix D2.

4.2.1 The Avaton or Enkoimeterion

The Avaton is a porticoed building (stoa), situated north of the Temple of Asklepios (fig. 70). In its first building phase (380 BC), it consisted of its eastern part only. In the 4th century it expanded as a two-storied building. It was revealed during excavations in 1881 and 1940-1945. The excavators proceeded in completions of missing parts and small modifications.

At the time of the establishment of the Committee for the Conservation of the Epidauros Monuments (1984), its state of preservation was desperate, due to the lack of effective measures after its excavation, harsh weather conditions, vegetation, visitor wear, and looting. The stereobate of the ground stoa colonnade survived in full height; the euthynteria survived in the east end; the parapets of the colonnade gaps were fragmentarily preserved; and the pillar colonnade of the ground floor was preserved in good state (figs. 79a, 80a).

4.2.1.1 The anastylosis programme

Excavation sections and clearings aimed at diagnosing the state of the structure (figs. 76a, b), chronologically determining elements, exploring dimensions, and enriching historical information. The anastylosis study is based on extensive documentation, including impressions of architectural elements and graphic restorations (fig. 78) (Maurommatidis 1987b, 26; 1987c, 9).

New porous stone for re-integrations and additions to the original architectural members is used, after research on their compatibility (fig. 84). Casts for imprinting disfigurements of original surfaces and traditional stonework tools for transferring these distortions in new stones are employed. Surviving conserved members (fig. 77, 83) are re-assembled in their original or matching locations. Integrated parts are joined with cement mortar and titanium rods. Thin plates of lead are placed between blocks to prevent dampness. Differentiation between new and old materials is achieved with rougher sculpting of the surface of the additions (fig. 81). Interventions are implemented in the same way in which the works in antiquity were done – transporting and setting up structural elements, sculpting and *in situ* elaboration of members (CCEM 1988b, 2-3; Katimertzi 2000, 1; Maurommatidis 1987b, 26-27; 1987d, 34; 1999, 32).

The anastylosis programme includes restoration, conservation and anastylosis of the walls, the limestone benches, the east side, the sacred well, the Ionic colonnade, the stereobate of the colonnade of the ground stoa, the euthynteria and the stylobate at the east side, the external colonnade, the parapets of the upper colonnade, the ground floor pillar colonnade, the staircase, the Roman buttress, the natural ground and the wooden beams (fig. 76c, d, 79, 80). During clearing works, a large number of original members were discovered. Consequently, anastylosis in greater height, than the initial one, is implemented (CCEM 1988b, 4-7; Katimertzi 2000, 2; Maurommatidis 1987b, 27-31).

4.2.1.2 Observations and discussion

The anastylosis programme is not completed yet. The following discussion and commentary are not conclusive, but based on actions proposed and currently in progress, as well as on relevant indications of the process and its expected results.

4.2.1.2.1 Analysis of objectives, and whether or not they were met

Conservation and anastylosis were decided because of the quantity of original material and its destruction from natural phenomena and constant wear by visitors. Primary objective becomes the protection of the surviving parts of the monument (Maurommatidis 1987a, 21). This is undoubtedly achieved, firstly because many original members are conserved and stabilised before being re-integrated to the structure. Secondly, by being reassembled they are not left on the ground to further deteriorate. Their reincorporation offers better protection to them and to the ruin.

An equally significant aim is the education that will be provided through improving the legibility of the ruin (Maurommatidis 1987a, 21). The re-assembled members, so far at least, allot the desired third dimension to the monument, thus, improving its legibility and enhancing its educational values. Notably, in most case studies, education is a primary reason and objective of the anastylosis programmes. Yet, problems arise when education is projected to justify extensive interventions. This seems to be the case here too. The actions described and planned are undertaken for the sake of educating the public. Many of these actions are quite extensive and require a great amount of intervention. For instance, proposals for reconstructing the wooden beams of the ground floor pillars are mainly justified by the educational benefits they may have (see Bouras in CCEM 1987a, 93), as reconstruction will clarify the structural layout and give morphological evidence of the monument, rather than ensuring its structural stability.

Furthermore, since anastylosis is considered 'educational in its nature' (Giraud in CCEM 1987a, 40), the continuous use of the term *didactic anastylosis* within the proposal is criticised and publications and interpretative material are suggested for preparing visitors before entering the archaeological site (Tanoulas in CCEM 1987a, 52). Educational values do not have to be enhanced only through anastylosis. A wide variety of means can be employed, individually or in combination, for informing and educating visitors. The public may need extensive interventions to understand a monument, connect to it and be educated by it, but there should be limits to the degree of intervention, if we care for the ways that authenticity is reflected in a monument and we wish to minimally interfere with the material. Plus, the public should be consulted in such cases. Their ideas and opinions should be researched and taken into consideration if the aim is their education. Moreover, as already discussed in the Acropolis monuments, education and the public are strongly related with tourism, in terms of the financial profits from high visitation. This is certainly not acknowledged in Epidauros, even though it would be impossible not to consider tourism as a benefit.

Anastylosis of the Avaton aims at elevating the sacred space of the site (Maurommatidis 1987a, 21). The presentation of the site is indeed improved, especially since anastylosis programs are implemented at the Tholos and the Propylon of the Gymnasium. These issues will be more analytically discussed below.

Accordingly, we could safely assume that the objectives of the restorers are met or that they will be fulfilled, as long as the program is completed successfully and with consideration of the problematic issues.

4.2.1.2.2 Theoretical framework of the anastylosis works

The proposal is based on the *Venice Charter*– the articles of which are interpreted and the way they apply to the anastylosis of the Avaton is presented in detail (see Maurommatidis 1987a, 21-25).

An initial point relates to Article 2 of the charter and regards the establishment of a multidisciplinary committee responsible for the scientific decisions and the co-ordination of restoration and anastylosis of the Epidauros monuments (Maurommatidis 1987a, 21-25). The Committee consists of professionals from multiple disciplines, while skilled workers make up the technical personnel. Research is conducted in collaboration with geological institutions and laboratories. Accordingly, the technical issues raised in anastylosis are resolved with the co-operation of science and technology. They cannot be solved by experience only and cannot be confronted by archaeologists and architects alone. They need scientific experimentation and knowledge. International conferences have taken place since initiation of the anastylosis works in Epidauros, similarly to those conducted with regard to the Acropolis anastylosis programmes.

An important matter regards the composition of CCEM that conducts the anastylosis program and the Central Archaeological Council, the body which approves the proposed works. Dimacopoulos (in CCEM 1987a, 17) underlines that three out of the seven members of CCEM are at the same time members of CAC. Although they have professional expertise and years of experience in the field, they can unintentionally influence other members of CAC. He also refers to 'a projected absence of other persons with a record and recognition in the field of anastylosis' (Dimacopoulos in CCEM 1987a, 18) as members of these committees. This statement should be taken into consideration by the bodies responsible for anastylosis works. Such committees have been established for the conservation and management of famous archaeological sites in Greece. Their institution is innovative and pioneering in the field, while it facilitates the work of the Anastylosis Directorate and ensures responsible restoration and anastylosis approaches. The multitude of disciplines collaborating and the diversity of opinions deriving from such collaborations form an exceptional example to be followed in future anastylosis projects, nationally or internationally. Nevertheless, some professionals are members of two or more committees. Undoubtedly, they have broad experience, which they use comparatively, striving for the best possible approach. The drawback is that this practice does not warrant a multitude of views and opinions, essential for multilateral approaches. Even if that is ensured by the conduct of conferences, it could be more beneficial for anastylosis practices to include more professionals in such committees and establish a group of experts with advisory role.

Regarding the training and education of restorers, the committee welcomes and positively considers the involvement of further professions in anastylosis, given the existence of relevant qualifications and guidance (see CCEM 1987a). From this we can presume the need for training programmes in anastylosis, not only in Greece but internationally too. There are established restoration schools and university courses on restoration and heritage management worldwide. If multidisciplinary approaches are the future, then programmes should be organised and include extensive training and information on heritage preservation and on collaboration of disciplines.

Another issue relates to Article 3 of the charter and the elevation of the architectural elements and peculiarities of the Avaton (fig. 78) (Maurommatidis 1987a, 21-25). These features are significant evidence of its artistic and historical significance. Anastylosis projects and indicates the original form of the monument, as it becomes obvious from the works completed so far, and results in preserving it as a historic testimony of the ancient medical practice and as a unique architectural example.

However, uncertainty regarding some architectural details (Bouras in CCEM 1987a, 89) is acknowledged. Difficulties in estimating the original height of the columns of the lower stoa (fig. 82) (Coulton in CCEM 1987a, 37) and the subsequent decision for a more precise anastylosis in height after more structural elements were found (see Katimertzi 2000, 2) raise questions about the substantiality of information on which anastylosis was based. Archaeological and architectural studies were conducted, but the monument is located in an enormous archaeological site, where it is possible to find further surviving members. The accuracy of anastylosis is questioned in such cases, unless the site is fully excavated, recorded, and studied. Speculations over the priority of immediate anastylosis for protection and interpretation or of anastylosis based on sufficient evidence to proceed accurately and utilise a great amount of original members should not be ignored. This dilemma should be confronted in a well thought-out management plan. In this regard, the principle of reversibility addresses exactly the issue of possibly reversing the undertaken actions and incorporating further original elements in the future.

Another principle that follows Article 4 of the *Venice Charter* (Maurommatidis 1987a, 21-25) becomes the curbing of further deterioration to the monument. Conservation of structural members and the building itself is essential for its future preservation. A discrepancy is noted though. The specific article discusses the maintenance of conserved and restored monuments. Future plans, after anastylosis is completed, for preserving the acquired state of the monument and pausing possible continuing deterioration would be expected, but maintenance actions are not mentioned anywhere.

Anastylosis is undertaken in order to annotate the monument and, consequently, benefit the public, in accordance with Article 5 of the charter (Maurommatidis 1987a, 21-25), which discusses the use of monument for socially useful purposes. As shown in the Acropolis anastylosis projects, this socially useful purpose is freely interpreted as the education and benefit of the public and does not refer to a functional use of the monument.

The improvement of the legibility of the Avaton and the underlying of its role as the north boundary of the sanctuary follows Article 6 of the charter about the preservation of the traditional setting of the monument (Maurommatidis 1987a, 21-25). Even though anastylosis will result in increasing the height of the building, the impact of the Avaton will not be as great, because CCEM is currently implementing anastylosis in major monuments of the site and plans restoration or partial anastylosis of other monuments and arrangement of the dispersed material. Already the site looks more legible and its north boundary is defined. Such actions are important so that the restored monument does not impose on other buildings within the site, even though it will take some time before we have the whole picture of the site of Epidauros with its restored monuments.

Further technical issues with a theoretical background stem from Articles 9, 12, 13 and 15 of the charter and relate to respect for the original material (Maurommatidis 1987a, 21-25). Additions respect all parts of the monument and aim at providing unity of the image of the structure and regenerating the morphological unification of the two phases of its history. Respect for original material is also shown by the extensive research undertaken in order to decide the most compatible material for additions and completions. The initial proposal suggested limited use of artificial stone for completion of surfaces and wider use of natural stone in every other case, but a series of experiments resulted in stones with characteristics less encouraging than expected (see Maurommatidis 1988). It was then decided to use only natural stone. This procedure is indicative of the committee's seriousness in tackling technical issues, which is also reflected in the efforts to find effective measures for conserving the fragile surviving porous stone. These concluded in the use of lead leaves for waterproofing. Thus, the matter of selecting the most appropriate and compatible material should be subject to examination of previous examples and scientific experimentation, so as to deal with problems of compatibility of integrated new material and ensure best results. As this matter was raised due to the principle of respect for the ancient material, the theoretical questioning initiated technical research and implementation. The fact that the solution of problematic situations does not depend only on theoretical speculation, but also on available resources that facilitate technological experimentation should also not be ignored.

Differentiation between new and original material (figs. 77a, 81b) is achieved by avoiding as much as possible new interventions on original members and slightly projecting new parts (Maurommatidis 1987a, 21-25). Completions have a different colour tone or technical roughness and information is inscribed in non-visible surfaces. The latter is discussed in detail in the Parthenon anastylosis. The other two techniques differentiate new members from original ones without creating extreme contrasts when viewed at a short distance.

According to Article 10 of the charter, a combination of both new and traditional techniques is employed (Maurommatidis 1987a, 21-25). Traditional tools are utilised to sculpt, elaborate, and work on the connection points of new members. Further traditional methods are preferred in the assembly of new and original elements. This tendency towards traditional techniques is related with authenticity in workmanship.

Combination of both new and traditional methods is obvious in joining fragments of ancient or new stone members. Generally, diverse solutions are adopted in different cases, depending on technological advances at the time of implementation. Despite questions on the price of titanium (CCEM 1987a, 27, 85, 93), cement mortar together with titanium rods are used in this anastylosis, as in the Acropolis monuments. Joints made of wood will also be utilised, as in antiquity, in their original positions – fixings in Π shape. Yet, this was doubted because the existing fixings are broken (CCEM 1987a, 10, 44). Consequently, although ancient methods and techniques are preferred, practical problems may undermine their implementation.

Respect for the valid contributions of all periods, in accordance with Article 11 of the charter, is shown by not intervening on the post-Roman phases and the Baths of the

Asklepios (Maurommatidis 1987a, 21-25). Related to that is the issue of the stone benches originally placed in the ground floor stoa, but found in second usage in the Sanctuary of the Egyptians. The originals will be kept in their second usage, whilst copies will be placed in their original location (see Maurommatidis 1987b, 27-31; CCEM 1988b, 4-7). Specific reasoning possibly justifies this particular choice, but it is not presented in the anastylosis study. However, there are already three benches surviving *in situ* in the Avaton. Production of copies of the rest of them is not necessary, as it will actually multiply the amount of new material incorporated into the building. A compromise could be found by conserving the ones existing *in situ* and providing further information about their function and later usage. That would easily provide both visitors and professionals with visual information of the original form of this part of the monument.

This phenomenon is quite common in classical monuments in Greece. In the past, ancient monuments were dismantled to utilise their architectural elements as building materials in later constructions. This creates ethical problems for those who undertake anastylosis. Usually, they are not returned to their original position, because to detach them 'would be violation of the later history of the monument' (Bouras in CCEM 1987a, 92). Furthermore, in the sanctuary of Asklepios, a substantial amount of members from various monuments is incorporated into a Roman wall. No definite decisions have been made yet and the committee lingers between the 'historic values of the Roman wall' and the 'artistic values of the embodied architectural elements' (CCEM 1987a, 6). The answer will only be found by assessing the values of the monument and the site, so that decisions can be made. As far as the Avaton is concerned, there is no presentation or assessment of its values; values were merely implied when the intervention works were described.

In accordance with Article 15 which endorses anastylosis as re-assembly of original but dismembered parts, the restorer underlines that surviving members are assembled in original or matching locations. This forms a quite interesting issue of anastylosis, which has already been discussed in the Erechtheion.

Exhaustive documentation and publication of the monument is touched upon by Article 16 (Maurommatidis 1987a, 21-25). The final publication awaits completion of the works. The available documentation comprises of the anastylosis proposal (CCEM 1987b) and its revised version (CCEM 1988b), publications about the site and of the proceedings of the international conferences. It serves the need for dissemination of information and for documenting and publicising the undertaken interventions. However, the third proposal, outlined after further architectural elements were found, was not publicly available, and information was found accidentally from a paper. This certainly does not ensure professional approaches.

However, within the proposal (CCEM 1987b), limited information on the amounts of original material and the new material to be integrated on the monument is presented. The person interested needs to consider the monument from plans and photographs and then surmise how much material will be used. This is not only a personal observation; most professionals participating in the international conference (see CCEM 1987a) consent to the provision of detailed and thorough information.

Remarkably, a suggestion for creating anastylosis archives (Coulton in CCEM 1987a, 38) was not exactly welcomed by a committee member, who argued that 'it will not be beneficial to future researchers, due to the frequently bad state of preservation of photographs and earlier publications' (Bouras in CCEM 1987a, 97). The preservation of archives is a crucial issue because of their significance for future research and for the desirable transparency of the works. If an archive in bad state cannot provide researchers with sufficient information, then why not work towards preservation and the care of its collections?

Further principles followed in the Avaton anastylosis, regard respect for the structural system, mainly preservation of the autonomy of the architectural members and their static sufficiency due to their weight, as well as self-protection of the monument by following the original structural system (Maurommatidis 1987a, 25). Accordingly, emphasis is placed in joints not being too strong, so they can stand dynamic strains without transferring them and their mechanical overcharge to the stone. This was decided because it was preferable to have joints broke rather than members and for protecting the archaeological values and the structural stability of the monument (CCEM 1987a, 35 and 77). The above technical matter is quite common in many anastylosis projects and in accordance with Starosta's research on issues of structural stability in anastylosis projects throughout time (see Chapter 3).

Among the additional principles guiding the works is reversibility (Maurommatidis 1987a, 25), ensured by 'technical experience and assistance by science and technology' (Zambas in CCEM 1987a, 78). Yet, the usual questions on its definition and attainability are raised. In the Avaton, the bad state of preservation of original material requires drastic protective measures and it will be difficult to detach integrated elements from the original blocks (see Giraud in CCEM 1987a, 43). This observation is certainly right. The issue has been quite extensively discussed with regard to the Parthenon and the Erechtheion anastylosis projects.

4.2.1.2.3 Issues arising from the project

It is quite hard to judge whether the undertaken works correspond to the proposals. The following observations are based on my last visit to the monument in summer 2002. The walls were being conserved and their members re-assembled (figs. 76c, d); the east side was under conservation (figs. 76a, b); the Ionic colonnade, the ground floor pillar colonnade, the staircase, and the lower parts of the building were already restored (figs. 79b, 80b); anastylosis of the external colonnade and of the Roman buttress was in progress. The pending works involve: the limestone benches, the sacred well, the parapets of the upper colonnade, the natural ground, and the wooden beams.

According to descriptions of the state of preservation of the Avaton, the excavation sections and the clearings, and the later discoveries of further original material, the quantity of surviving material seems to justify the choice of anastylosis as re-assembly of existing but dismembered parts of the monument. Photographs of the monument before the current anastylosis (figs. 79a, 80a) indicate that plenty of material that could be re-assembled on the building existed.

Anastylosis was also chosen in order to tackle the destructive effects of natural phenomena and visitor wear (see Maurommatidis 1987b, 26-32). Visitors walking around ruins contribute to the deterioration of the monument. Extensive research was conducted for the conservation of the surviving porous stone, seeking a harmless compatible material to be applied to original elements and protect them from dampness and physical deterioration. Anastylosis will result in structural parts being reincorporated in the building and protecting each other with their weight. They will not lay dispersed on the ground anymore. However, the proposal for reconstructing the wooden beams of the ground floor of the upper stoa (see Maurommatidis 1987b, 27-31) contrasts the declaration by the restorer himself (Maurommatidis 1987a, 24) that the anastylosis does not proceed in reconstruction work. New wooden beams may be incorporated because they are known from historical and archaeological sources while the fact that wood was certainly known as the original building material does not necessarily justify the argument either.

Despite the contrasting nature of these statements, it becomes apparent that some reconstruction work may be included in anastylosis. Thus, it can be concluded that anastylosis forms an architectural conservation method, which comprises actions with different objectives and features that can also be implemented separately. Furthermore, it is viewed as an intervention undertaken for various theoretical (legibility, education, preservation) and technical (structural stability, protection) reasons. While in the Greek context the term is used as an alternative to any kind of restoration, it is the actual re-assembly of dispersed original material that defines the practice. Given that surviving members of the Avaton are reintegrated on the monument, it should be acknowledged that anastylosis is implemented according to international standards and definitions.

However, it is not clear whether additions and completions are the minimum possible. In the anastylosis study (CCEM 1987b), the surviving members and how many of them will be re-assembled are analytically presented, but their quantity is not clear. Careful observation of the monument, in relation to the description of the works, reveals that the intervention seems quite extensive (figs. 77a, 81). Despite constant statements by the restorer about the minimum use of new material and less possible interventions, new material appears to be used in great amounts. In this regard, the possible establishment of amounts of original and acceptable new material in anastylosis becomes an issue to be further discussed. Restorers view it as a matter of common sense. Establishment of percentages of material forms a prerequisite for lucid proposals, as it addresses demands for scholarly presentation of anastylosis works. Most importantly, it would provide limits in anastylosis, since the amount of integrated new material seems to differentiate anastylosis from reconstruction and is often justified by the aims of the intervention.

In addition, the restorer specifies that the difference between anastylosis and reconstruction depends on the analogy between each completion and the total extent and volume of the building, as well as the size of the archaeological site (Maurommatidis 1987a, 24). This seems to be a quite radical assumption. Archaeological sites have variable sizes and to compare the form of the completed monument to the entire site, would allow extensive interventions and reconstructions. This is not the desired result, according to the latest theories about how to respectfully care for our heritage. The size of the Avaton and the site of Epidauros is substantial, thus, additions and completions will seem insignificant. Consequently, questions on the permissible extent of this anastylosis emerge once again.

As far as authenticity is concerned, since the works have not finished yet, definite conclusions cannot be drawn. Observations can be made, such as the tendency to employ traditional techniques, due to respect for authenticity in workmanship. Authenticity issues are mainly reflected in the original material of the Avaton and the protective and conservative measures undertaken for its preservation. As Bouras sustains (in CCEM 1987a, 99) in the Western world there is 'fetishism towards the ancient material' when it comes to restoration.

Furthermore, it is quite hard to judge the end result from an aesthetics point of view, although the majority of the conference participants disapproved the omission of speculation on aesthetics and the lack of philosophical questioning in this anastylosis. The proposal emphasises technical problems, without analysing in-depth the philosophy or discussing the theoretical framework governing the interventions. Yet, the committee argues that 'the person who intervenes with the monuments should not experience them romantically, but cognitively' (Lambrinoudakis in CCEM 1987a, 84) and that 'freeing ourselves from philosophical confusion, we will soon find solutions, because technical solutions can be found sooner or later' (Korres in CCEM 1987a, 59-60). However, they do provide interpretation of the articles of the *Venice Charter* that apply to their proposed actions. Besides, as it has been shown so far, technical matters are strongly related with the theoretical principles of the intervention. The importance of looking at all problems concerned with anastylosis under the prism of theory should be recognised. In this regard, Giraud (in CCEM 1987a, 474-478) suggests that 'Greek professionals should elaborate a theoretical framework including commonly accepted rules and aims for appropriate anastylosis interventions in archaeological monuments'. This suggestion highlights the significance of theory and philosophy in monument preservation and of a lucidly articulated framework in which anastylosis is undertaken.

Epidauros has been inscribed to the World Heritage List since 1988. It is an enormous site with a significant and long history. Its conservation and management have surely been decided and outlined according to a management plan. Interventions and other actions are planned and implemented to major monuments and the site itself (figs. 72-75, 85c), together with provisions for visitor accessibility and publications disseminating information to the wider public. Yet, the plan is neither available nor widely publicised.

Public involvement in anastylosis decisions and planning is referred to only in discussions, but does not happen in practice. To the question about whether ruined monuments should be restored or left alone, Zambas states that 'experts cannot and should not be the only ones to provide answers' (in CCEM 1987a, 78-79). The opinion of the public, including the technicians and stonemasons, should be examined. This view has not been previously expressed in the context of Greek monuments. Interventions have been and are undertaken with ideas of national and cultural identity, social use, and tourism in mind, but the public are unaware of decisions made for their sake. Furthermore, not much information is available on site for the public, apart from the basic information on the monuments and the stone inscription about the site being in the World Heritage List (fig. 71).

The advantages of this anastylosis are found exactly on the aims that it seeks to achieve (conservation and improvement of the legibility of the monument, together with elevation of the site) and its disadvantages in extending the intervention and proceeding with considerable amounts of new material.

4.2.2 The Propylon of the Gymnasium Complex

The complex, dated in the 3rd century BC, consisted of the Gymnasium, the monumental Propylon, and the Roman Odeum, and is situated at the south part of the sanctuary (fig. 70). The Propylon was a formal decorative entrance, a prostyle building with a Doric colonnade at the north. At the east and west, walls connected it to the Gymnasium.

The Propylon was revealed in 1884 (fig. 85a, b) but until 1984, no measures for its protection were undertaken. Its appearance resulted from sequential additions to the initial building, destructions, and lootings. Original material, either dispersed or surviving *in situ*, was exposed on the ground since the first excavations. Further deterioration was caused by time, weather conditions, and visitors. The foundation, part of the paved floor with the podium levels and the ramp were preserved but the mud-brick superstructure did not survive.

4.2.2.1 The anastylosis programme

Detailed documentation and systematic study of the preserved material were conducted in parallel with architectural clearings (fig. 87) and excavation works, which revealed numerous members, most of which survived intact. Their state of preservation and the possibility of restoring them were assessed. A programme for conservation of limestone parts is current conducted and includes photographic and graphic documentation of members, before and after conservation and re-assembly. The process is supported by thorough bibliographical research. Restoration work resets intact surviving blocks to their original positions, constructs completions for broken members in initial or similar positions, and completes missing parts with new ones (figs. 92, 93). Natural stone, selected through research programs and laboratory experiments (fig. 84), is used for production of new members and re-integrations. Other research programmes are involved with producing mortars for protecting the soft porous stones, cleansing members, and joining them. Anastylosis comprises assembly of members or fragments (fig. 88), with joining mortar for small fragments and internal reinforcement with titanium for larger ones. If it is not necessary, fragments stay unconnected in case more elements that can be re-assembled are found in the future (CCEM 1994, 7-8; Danali-Giole 1988, 36; Kyriaki 1988a, 163; 1988d, 8-11; 1988e, 48; 1999, 35-37).

The anastylosis (figs. 85c, 89) comprises restoration and anastylosis of the floor and the staircases of the podium, the euthynteria and the staircase (figs. 90, 94), the Doric colonnade (fig. 88), members of the walls (figs. 91, 95), and the Doric entablature. Members of significant architectural groups, including parts of the frieze and ionic architectural elements, will be exhibited in the museum (Kyriaki 1988a, 162).

4.2.2.2 Observations and discussion

In summer 2002, anastylosis works at the Propylon had not been finished, even though the restorers had initially stated that the works will have been completed by 1999. Yet, by 1999 the works were 90%completed (CCEM 1999). At the time of my visit to the site, the Propylon was still subjected to anastylosis, so no definite judgments can be made. It becomes particularly hard to assess whether the proposal is strictly followed and which parts of the structure are re-assembled and which are not. An attempt to assess the situation resulted in identifying that the floor and the staircases of the podium, as well as the euthynteria and the staircase were restored; anastylosis of members of the walls was still in progress; and works had just started in the Doric colonnade and entablature.

4.2.2.2.1 Analysis of objectives, and whether or not they were met

Re-assembly of the superstructure will result in protecting exposed surfaces (fig. 86). The principal aspiration becomes the arrest of deterioration, since the creation of a core of durable materials will protect the re-assembled members (Kyriaki 1988a, 160-162). Indeed, the members, especially those less durable, are subjected to further conservation treatments before re-assembly; hence, their deterioration is arrested. By integrating them back to the building, their exposed surfaces are protected. As noted in the Avaton, anastylosis may necessitate or be combined with conservation. This, in turn, highlights the fact that anastylosis is an intervention that may not be undertaken in itself, but as an action implemented within a wider framework of monument protection and preservation.

Anastylosis also aims at indicating the initial form of the building (Kyriaki 1988a, 160-162). Re-assembly of existing members with introduction of new material will certainly indicate the initial form of the monument. This is gradually becoming apparent.

Generally, it seems that the objectives of the restorers will be fulfilled. However, the reasons and aims of the anastylosis are not analysed. Despite being established in the general introduction, there is no further reference to them. The extent of work is simply described, in contrast to the Avaton, where each integration and re-assembly is explained in detail in relation to the aim sought to be achieved.

4.2.2.2.2 Theoretical framework of the anastylosis works

The methodology of the restorers is based on the *Venice Charter* and the additional principles adopted in every anastylosis of classical monuments in Greece (Kyriaki 1988a, 160-161). Some principles of the charter are not mentioned at all, though they apply through the multidisciplinary synthesis of the committee, the working teams, and the instigation of international conferences. Other principles respected, but not mentioned as such, are the preservation of the monument as a historic testimony, the care for the traditional setting, the use of both new and traditional techniques, and the respect for the valid contributions of all periods. The latter is reflected in the attempt to balance the classical and Roman phases of the Gymnasium. The Propylon belongs to the classical period, whilst the Odeum is a Roman addition. The approach attempts to balance both types of heritage. However, certain caution should be exercised since, in general, more attention is paid towards preservation of the classical heritage. Preservation of the monument as a historic testimony is reflected in its exceptional artistic and historic values, which influenced the architectural history.

Regarding the preservation of the traditional setting, it should be pointed out that the Propylon forms part of the wider monumental complex of the Gymnasium (Kyriaki 1988a, 160-161). Further anastylosis works are planned for the Refectory and the Odeum (both being parts of the Gymnasium). Hence, the Propylon is not going to impose on the rest of the ruin. In addition, anastylosis projects are currently implemented in the Avaton and the Tholos (figs. 73, 79, 80) and dispersed members not re-assembled on the Propylon will be removed for their protection in warehouses. Hence, the monument will not dominate in the archaeological site. The sanctuary of

Asklepios will consist of partially restored buildings, which will indicate its image as it was in antiquity.

The issue of the interrelation of educational and social values, as perceived through the free interpretation of Article 5 of the charter (see Kyriaki 1988a, 161) emerges once again (see Acropolis monuments and Avaton). Yet, there are different arguments, such as Linstrum's (in CCEM 1988a, 25), who associates the promotion of the educational value of the monument with the financial benefit from increased visitor numbers. This is a quite sensitive issue that certainly influences decisions on restoration and anastylosis, whether strongly or partially, but it is never admitted as such. This matter also depends on who provides the financial resources and how much they can have an impact on the decision-making.

Educational values are interrelated with academic values. As Linstrum highlights, academic values can be highlighted by reconstruction drawings while, according to Schwander, educational ones are better achieved by partial anastylosis and restoration (both in CCEM 1988a, 24 and 31). However, the fine line between enhancing educational values within the context of anastylosis and projecting them to justify its extent should be acknowledged. Education can be achieved with a combination of means – reconstruction drawings, small-scale models, videos and diagrams, explanatory material such as signs around the site, even organisation of ruins in low height and experimental archaeology (see CEEM 1988a, 21-46) – so it is not necessary to proceed with extreme measures to fulfill certain aims. The best approach is the one that considers all factors and chooses the middle road, using a combination of means.

Principles reflected in Articles 9, 12, 15 of the charter refer to the respect for original material and re-assembly in original locations, the use of a pantograph to achieve faithful copying, and the differentiation of members (Kyriaki 1988a, 160-161). Concerning the latter, the situation is similar to the Avaton, as the adopted solutions are the different sculpting of new members and the inscription of the intervention date in non-visible surfaces. Matters of respect for original material and the use of both new and traditional tools and techniques have been previously discussed with regard to the Avaton anastylosis.

Article 16 discussing documentation and publications is respected in various ways (Kyriaki 1988a, 160-161). The anastylosis proposal (CCEM 1988c) and the proceedings of the international conference (CCEM 1988a) have been published and are available in academic libraries. An appraisal of the published proposal should take place, as it provides extensive information on the undertaken archaeological and architectural research and on the structure and construction of the building. It is also full of bibliographical references and comparative examinations and studies of other similar architectural and structural examples. The result is a thorough and informative investigation, which clarifies questions about how the intervention will establish the form of the monument.

However, the actual description of the proposed anastylosis occupies a small part of the extensive architectural and archaeological study, having an almost a supplementary role. It covers technical issues but there are not many references to the theoretical aspects of this anastylosis, with the exception of the presentation of the principles of the *Venice Charter* that are followed. Another significant point made in the conference (CCEM 1988a) suggested the chronological division of the two studies – the archaeological/architectural and the anastylosis one – so that experts and those interested have the time to examine them and comment upon them. Professionals have often pinpointed, quite accurately, the lack of time in discussing the architecture of the monument and then converse on its proposed restoration.

In general, the quality of documentation before and during the intervention is exceptional. To assess the documentation after anastylosis is not possible yet, since the works are still in progress. The only further observation that needs to be made is the suggestion, by Hoepfner (in CCEM 1988a, 20), to publish the study of the monument in other languages, for instance in English, so that a wider audience can access it. However, whilst his suggestion was welcomed by the committee and was emphasised with the creation of a widely available archive with all documentation available, its realisation is pending.

Further principles respected in anastylosis projects in Greece, especially reversibility and self-sufficiency of the structural system (Kyriaki 1988a, 160), are simply mentioned in the theoretical framework. Respect for reversibility is reflected in not connecting, if not structurally necessary, fragments and completions of missing parts, in case original fragments are found in the future. This raises the same question already discussed in the anastylosis of the monuments examined so far, with regard to when such an action would be deemed necessary. The principle of reversibility is also reflected in the use of pantograph, an apparatus which transfers the texture of connecting surfaces. So, if a member or fragment needs to be removed, there will be no damage to the original part. This action indicates that, despite the relativity of principles, certain actions can contribute to their attainability in practice. For instance, resolution of technical problematic matters is largely based in the principle of respect for original material. Furthermore, the self-sufficiency of the structural system is not only a technical aspect, but it is also related to preserving the authenticity of the structure and its design, as already noted in previous case studies.

Nevertheless, a comment made by the restorer of the Propylon should be further analysed. Kyriaki (1988a, 160) admits that there is an 'effort' to follow the theoretical principles. This statement might imply a willingness to justify possible mistakes and extensive works and/or a difficulty in applying the principles of the charter in practice. A relatively free interpretation of the *Venice Charter* leaves freedom to the restorer who undertakes the anastylosis. This is recognised and accepted in the architectural conservation field and it is also identified in the context of anastylosis of classical monuments in Greece.

4.2.2.2.3 Issues arising from the project

For the conservation and management of the entire site, the same comments made with regard to the Avaton apply here too. Additionally, it should be noted that further architectural members belonging to the Propylon were discovered during the anastylosis. That led to a renewed proposal (see Kyriaki 1999, 37-38), as in the Avaton. Hence, although protection of structural and architectural members necessitates conservation and anastylosis, a more thorough approach, in order to recover further surviving elements, could delay anastylosis. The emerging question relates to establishing when excavation should stop and conservation and presentation of a monument initiate. In this regard, conservation treatments and temporary protection measures will extend the timeframe during which additional original members can be retrieved.

Furthermore, after the works had started, there was still ambiguity regarding the interpretation of the Gymnasium complex (see CCEM 1988a). Archaeological excavations were limited to trial sections and clearings of the site and resulted in locating more members and clarifying architectural and archaeological questions. Since, there was still ambiguity regarding some issues, excavations should have probably been more extended. However, this is where the question of efficiently managing and conserving a site and its monuments emerges. The possibility of locating further structural and architectural elements is always present in an archaeological site, such as Epidauros, where excavations are carried out every year. Hence, there should be more clearly-phrased planning of alternative solutions and actions if a new discovery would alter the decided and applied anastylosis. These issues should have been addressed in a management plan.

In addition, the management plan should have attended to the general image of the sanctuary after all anastylosis and restoration programs are completed. This issue surfaced during the conference on the Propylon anastylosis (see Dimacopoulos in CCEM 1988a, 15-16) and should certainly be a prerequisite in heritage conservation and management. Future planning and maintenance of a site or a monument are equally significant to decision-making and implementation. In Epidauros, the final form of the restored monuments, their interaction within the site, and their future maintenance are issues entirely absent from any published studies or sources. Surely, this discounts not only basic conditions in heritage management and conservation but also the declared respect for the monuments and their setting.

Another matter concerns the absence of information to the public during their visit to the site. At the time of my visit (summer 2002) not much information was accessible to visitors, apart from a couple of leaflets and signs dispersed around the monuments. Anyone interested in a more detailed interpretation and presentation of the sanctuary and the monument would need to do some research before their visit, as there are excellent publications with plenty of photographic material addressed to the interested public. However, the restorer confirms that there will be interpretative material to inform visitors and aid the legibility of the site (see Kyriaki 1988d, 11-12). Apparently, these will be realised after completion of the anastylosis; yet, the importance of their availability during implementation of the works seems to be underestimated.

In addition, the non-inclusion of the stakeholders in the process of decision-making and implementation was admitted by the committee during the conference. Interestingly, a professional disclosed that visitor surveys have never been conducted in the context of classical monuments in Greece (see Bouras in CCEM 1988a, 46-47). Educational values and didactic aims are projected as essential objectives of anastylosis, but no progress is made as to consulting the people that the professionals want to educate. The fundamental question evolves around the meaning of deciding anastylosis in absentia of those interested. This fact is only lately being acknowledged but, hopefully, it will lead to actually resolving the matter.

A remarkable suggestion during the conference referred to the conduct of a specialised conference on the social aspects of anastylosis of monuments in Greece and how restoration professionals should respond to that (see Bouras in CCEM 1988a, 47). This proposition implies the impact of anastylosis on society and, in turn, the recognition of multiple values to be taken into consideration in decision-making. In an era that heritage conservation and management are oriented towards respect for the values represented by monuments and the ways in which they can be enhanced and respected without conflicts, the Propylon forms another example in which values are only selectively respected and there is no analysis of or reference to their entirety.

Similarly to the Avaton, the Propylon anastylosis is also studied, prepared and planned by following solutions proposed by research programs undertaken at the Stone Centre of Greece. These regard the possible production of artificial stone, the determination of quarries suitable for quarrying natural stones similar and compatible to the originals, the creation of a protective plaster for surfaces, similar to the one used in the past, and plans for cleaning stones (see Kyriaki 1988d, 8-10). This exceptional approach indicates another level of respect for the original material and the structure. At the same time, the anastylosis proposal is based on extensive archaeological and architectural study of the building, addressing questions of date and use of its material, as well as of its construction and architecture.

Another technical aspect concerns the proportion of new and original material. The amount of surviving material is quite low. Original members survive in less than 50%, especially in the superstructure, while the substructure survives in greater extent. Besides, architectural members of particular importance that have a special location in the building will not be used in the anastylosis but will be exhibited in the museum instead (see Kyriaki 1988d, 11-12). However, this does not justify anastylosis as 're-assembly of existing but dispersed members' (ICOMOS 1964). Given that the new material required for their replacement will be extensive, the definition of this intervention should probably be re-examined.

In addition, it should be noted that throughout the proposal the terms *restoration* and *anastylosis* are used interchangeably. As a consequence, either these two interventions are not differentiated or restoration may involve anastylosis work and vice versa. Hence, it becomes exceptionally difficult to understand each type of intervention and how it differentiates from each other. The only certain assumption that can be made is that each intervention may involve actions that could be described as conservation, restoration, even reconstruction – a relevant discussion concerned the use of a mobile in order to protect the monument against the winter conditions, particularly the rain (Hoepfner in CCEM 1988a, 21; Gruben in CCEM 1988a, 22).

Interestingly, the amount of surviving material is provided in numbers, in contrary to the practice for the Avaton, where no percentages of original material are given. These percentages rarely refer to what they represent, except for a few cases where it was clarified that they represented surface or amount of material. This brings up the issue of whether the amount of surviving material can be measured without assessing the condition of the fragments (see Dimacopoulos in CCEM 1988a, 18).

Additionally, in this case, there is not much discussion about authenticity, even though the undertaken actions are similar to all those examined so far and which, one way or another, are related to authenticity.

Generally, the advantages of the undertaken anastylosis are found in: achieving the protection and structural sufficiency of the monument; resolving technical and theoretical matters through multidisciplinary approaches; enhancing educational and social values; improving the legibility of the monument, and extensively researching its archaeology and architecture. Disadvantages are the lack of concrete ideas about how the restored monument will be integrated into the site and about the incorporation of new material. The theoretical and technical framework of the anastylosis is not given much gravity either, in comparison to the architectural study, while not much effort is put towards informing and involving the public.

4.3 The Hellenistic Stoa at the Acropolis of Lindos, Rhodes

4.3.1 The Hellenistic Stoa

The Hellenistic Stoa (3rd century BC) of the Acropolis of Lindos (figs. 96-100) is a Π-shaped Doric stoa (fig. 102). It consists of two covered wings which flank the staircase of the Propylaeum (figs. 99, 102). In 1914 completion of columns and consolidation works were undertaken (fig. 103). In the 1930's dispersed members were re-assembled with reinforced concrete (figs. 104, 105, 106a, 107a, 108a, 109). In 1993 research and restoration initiated by a scientific committee (CCAMAL). Deterioration of the ancient material from the sea environment, as well as from the unfortunate methodology and the inappropriate material of the past anastylosis was obvious. Oxidation of steel joints had caused expansion and cracking of the concrete and the stones (fig. 111). The original static system had been neglected, rendering its behaviour in wind or earthquake unpredictable (fig. 110). Large parts of the foundations survived, while column drums and elements from the walls were found *in situ*. The back wall of the west and north wings and the two separating walls of the wings were preserved. The side walls and the east back wall survived partially.

4.3.1.1 The anastylosis programme

Infrastructure works relate to: organisation of the work-sites (figs. 115, 116); consolidation of the underground vaults and organisation of exhibited non-assembled members in them (figs. 117, 145, 147); geological exploration to locate quarries for extracting porous stone for completions; engineering geological studies on the durability of the stones and the slope; studies for the production of mortars (fig. 118); and architectural research, including studies on the column shafts (Kazilis and Dalias 1988, 147-151; Pakkanen 1998a, 150-154; 1998b; Zervoudaki 2002, 6).

Interventions are extended only on the parts previously restored, especially the colonnade. Dismantling of columns and cleaning of ancient members (fig. 119) is followed by treatment, though some previous completions remain. The feasibility of replacing them with new sandstone and returning them to their original or matching locations (fig. 121) is assessed. Fragmentary ancient parts, which do not preserve their original volume and cannot sustain much load, are drawn, photographed and kept in storage. They are replaced by freshly quarried sandstone. Plaster-casts are made and then, using a pantograph, the points of ruptured surfaces are transferred to new stones, making them exact copies of missing or removed ones. Ancient members not belonging to the monument are removed, while members found in incorrect locations are transferred to correct ones, if possible. Connecting original members and new material is achieved with titanium or bronze rods and mortar (fig. 120), produced and tested through laboratory experiments. The mortar, poor in concrete but with earth and lime, is strictly limited around the rods and is not exposed to the environment (Eleftheriou 2002a, 115; 2002d, 107-109; 2002f, 110-111; Filimonos-Tsopotou and Eleftheriou 2000, 3; Pakkanen 1988a, 110; Pikoula 2002b, 161-165; Pikoula and Papadimitriou 2002a, 166-171; 2002b, 144-147).

The anastylosis programme is conducted in two stages. The first one consisted of restoration of the transverse colonnade. During that, new data derived, according to which a new anastylosis proposal was formed. Accordingly, six intervention stages were planned (figs. 104-108, 123, 129-132). These involve columns of the free colonnade, the east corner and the west wing. By 2000 the first four projects were complete (figs. 112-114, 124-128, 130, 131). Work will continue after restoration of the temple of Athena and is planned to be concluded in 2008 (Eleftheriou 2002a, 115-140; 2002e, 112-113; Filimonos-Tsopotou and Eleftheriou 2000, 4; Pikoula 2002a, 193-204).

Encountered problems concerned efforts to improve the structural method of assembling column drums; protection of external surfaces; impossibility of researching all available material; and extensive use of new material (Eleftheriou 2002b, 173-180).

4.3.1.2 Observations and discussion

This anastylosis programme initiated in 1993 and has not finished yet. Only the first stage was completed in 2000. Any comments are only indicative of the entire anastylosis and some questions may be answered after completion of the programme.

4.4.1.2.1 Analysis of objectives, and whether or not they were met

The primary reason was the urgent need for intervention after the past anastylosis that caused rapid decay of the monument. It aimed at pausing further deterioration and restoring the static resistance of the structure (figs. 137, 137) (Eleftheriou 2002d, 107; Zervoudaki 2002, 5). Causes of deterioration are dealt with as the monument was dismantled, its members were conserved, and then re-assembled again. Removal of inappropriate material of the past anastylosis ensures that the structure will not suffer anymore from its harmful effects. Conservation of deteriorated members attempts to stop their dilapidation from the sea environment. The original monolithic static system was altered in the 1930's and the need for anastylosis was identified after a column collapsed in 1975 (fig. 110). The static sufficiency of the monument is restored, by making the structure stable against earthquakes – the Stoa is located in a seismic zone.

It is quite difficult to judge whether conservation is successful and whether deterioration has indeed stopped but the description of the undertaken actions shows achievement of this aim. It is, thus, once again proven that anastylosis is not undertaken as an action in itself, but in combination with conservation and stabilisation actions.

Morphological restitution aims at elevating the monument and the site and enhancing the artistic, historical, and scientific values of the monument, related to its architectural synthesis (Eleftheriou 2002d, 107). This seems to have been achieved, even though the works have not been completed. The exceptional architectural, artistic and archaeological values of the monument are shown in a better light. The restored monument is located within a larger archaeological setting and enhancement of its form integrates it harmoniously into the imposing site.

Preservation of the image of the Hellenistic period, as established in the memory of people, is a significant objective sought to be achieved with anastylosis of the Stoa and other monuments of the site (Zervoudaki 2002, 5). Preservation of the form of the monument is combined with the limited possibility of re-using ancient material (fig. 143) (Eleftheriou 2002d, 107-108). This approach attempted to fulfil the requirement for preserving historical phases, while correcting the mistakes of past interventions and re-assembling original material that is too weak and deteriorated to be utilised. It forms an extraordinary attempt, though it is a strenuous objective to achieve, as not all errors can be corrected and the practical impossibility of researching all available material impedes this effort even more.

Interestingly, the reasons for implementing anastylosis refer to technical aspects only, mainly the need to rescue the structure and the building material from further deterioration. They are clearly differentiated from the aims which have a much more theoretical background, such as preservation of the monument for the future and enhancement of its artistic, historical, and scientific values. In general, we could conclude that the objectives of the restorers are met or that they will probably be met after completion of all planned interventions.

4.3.1.2.2 Theoretical framework of the anastylosis works

The theoretical framework of the anastylosis is based on the *Venice Charter* and those principles followed in the context of Greek classical monuments (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171). However, it was stated that the theoretical framework was determined by the problems presented in the monument and the results of previous interventions (see Eleftheriou 2002d, 107-108). This becomes the case in every monument that has been previously restored. Theories and principles may require a more flexible approach or adaptation to the specific needs of the monument. In this regard, it is also admitted that these principles are viewed with certain flexibility, an issue related to the interpretation of principles, as it has also been noted in the anastylosis of the Erechtheion and the Parthenon.

The anastylosis methodology in its technical agenda comprises of a wide variety of studies. Extensive archaeological and architectural research was conducted in order to determine the date, history, and architectural characteristics of the Stoa. Such studies are evidently essential when implementing anastylosis. Here, the undertaken study is impressive, since it has to take into account the incomplete records of the Italian expedition. It explains the architecture of the monument and its features (see Eleftheriou, 20002g), particularly the ancient connecting joints and how they are utilised in the current works. Research on joining and re-assembling members during the past restoration identifies mistakes and assists in finding the best possible solutions (see Pikoula and Papadimitriou 2002b). Further studies take place too, including engineering, geological, and structural ones, as well as extensive laboratory research. This thorough methodology is noted in recent projects, guaranteeing a multidisciplinary approach, which is also noted in the synthesis of CCAMAL, according to the interpretation of Article 2 of the *Venice Charter*.

Enhancement of the historic, artistic and scientific values of the monument, a principal aim of the anastylosis, is actually in accordance with Article 3 of the charter. The Stoa has a long history and is an impressive example of Hellenistic architecture. The site has artistic and historical values, being an important place of Rhodes and consisting of monuments from prehistory until the recent times. Its scientific values are included in its historic and artistic ones, as information is extracted through research studies. However, the monument has plenty more values, such as educational, discussed further down; archaeological, which have not been mentioned but are obviously included in the scientific ones; social and cultural ones, in the sense of their importance to the people of Lindos, of Rhodes, of Greece and internationally too, which are also not discussed at all. Hence, the significance of monument is multilateral. Unfortunately, in the Stoa, there is no analysis or discussion of values, just a simple reference to them and their enhancement with anastylosis.

Provisions about elevation of the site (emerged in parallel to elevation of its monuments and in accordance with the principle of respect for the surroundings of the monument), follow Article 6 of the charter (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171) Restoration and anastylosis are currently implemented in other Acropolis monuments, such as the Temple of Athena (fig. 101). Most of them are primarily dictated by stability problems. However, they also aim at enhancing the values of those monuments and the site, as in most cases, the values of a monument may correspond to the values of other structures within its setting, while the values of a site are enhanced through its restored monuments.

Respect towards the ancient material is indirectly endorsed in this anastylosis. In the contrary, it did not form a theoretical principle to be applied in the 1930's anastylosis. For instance, structural and architectural elements were randomly assembled and sculpted, so that new parts could be adjusted to them (fig. 119).

The choice of natural stone for completions and additions to original members is decided after laboratory experiments and researchers on quarries, in accordance to Article 10 of the charter (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171). The choice of the most appropriate natural stone is determined by various factors, from theoretical (respect for original fabric by selecting a compatible material) to technical and financial ones. Essential criteria are the physico-chemical and resistance features, as well as the achievement of harmonious integration of new and original material. Similarly, the connecting material utilised – titanium, bronze, and weak mortar (figs. 118, 120) – for integrations and original members, is chosen after laboratory experimentation, indicating too the seriousness with which the compatibility of new material is considered.

It should also be noted that in the 1930's the employed material was mainly reinforced concrete and mortar (fig. 111), as endorsed by the *Athens Charter*. No definite suggestions in this regard are made within the *Venice Charter*, which rather underlines the importance of ensuring the compatibility of the chosen material, leaving the restorers free to decide what would be best for the monument. New technologies – such as laboratory research and experimentation – are employed in the anastylosis of the Stoa in order to ensure successful conservation and re-assembly of members, as well as for reasons of respect towards the original material. The difference between the past and recent years is that new technologies are employed only after experimentation. For instance, these technologies lead to conclusions about the durability and the features of new material, something that in the past only the passage of time could tell. Therefore, new technology and its importance for anastylosis should be acknowledged.

Traditional methodologies are employed too, whenever possible, for reasons of respect for the ancient materials and the structural system. Combination of both new and ancient technologies is a significant aspect of anastylosis, as each one can cover diverse issues. Their choice, depending on the case, results in better-informed and respectful solutions. The same applies to new devices (for instance, the use of pantograph) and traditional tools (fig. 122).

Seismic activities in the area form a separate subject of study. The original structural system is followed (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171), in contrast to the past anastylosis which altered it, ignoring the ancient connecting points and creating powerful connections for new and original members, leading to destruction of structural material. Maintenance of the individuality of each member and following of the ancient static system, guarantees the durability of the structure, as it was designed in antiquity. This approach is common in the recent anastylosis projects (see Starosta 1999) and derives from the latest restoration theories of respect towards material and construction, authenticity of structure, and after the lessons learned from the catastrophic examples of past anastylosis works.

Additionally, what is advocated in the *Venice Charter* as differentiation but harmonious co-existence of new and original material (Article 12) is followed here (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171), through differentiation of colour and texture (figs. 134, 135, 141, 142). Whenever structural or architectural details cannot be decided, their restitution is not attempted, so as not to falsify the history and architecture of the monument. The effect of natural deterioration in the bright colour and texture of new members (figs. 138, 139), an issue extensively discussed in previous case studies, is examined too.

Another aspect relates to respect for the latter additions to the monument, according to Article 11 of the charter (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171). In the beginning of the 20^{th} century, the Italian expedition, due to a preference for the Hellenistic period, led to the destruction of the later remains of the monument. Attention is paid to the Hellenistic buildings of the site and their preservation with respect to later additions, without any prejudice towards specific periods. It is also declared that the past restorations have historic values that should be preserved. The tendency is towards maintaining the form given to the monument by past interventions, rather than towards prioritising correction of morphological and other inaccuracies (see Eleftheriou 2002d, 109; Pikoula and Papadimitriou 2002a, 171). This forms an adaptation of the specific article that should always be taken into consideration when restoring monuments that have been subjected to interventions in the past.

What shows the importance of accurately documenting interventions to a monument is that the contemporary restorers encountered many problems due to the lack of or incorrect documentation by previous scholars (see Eleftheriou 2002i, 41). Difficulties emerged in decisions regarding the dimensions of the building. The Danish expedition kept accurate records and extensively published their research (see Pakkanen 1998a, 147-171), which facilitated the work of the current restorers. Comprehensive documentation is essential after an intervention takes place, as scholars cannot turn back in time and study the monument. This is why the *Venice Charter* weight is given to the documentation and publication of restoration works. In the current anastylosis, extensive documentation became fundamental (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171). Publication of the monument – including its history, architectural and archaeological study, study of past interventions, the anastylosis program, and a commentary and assessment of the implemented programs – and accompanied by a volume with drawings and photographs of the monument and the different stages of the works, is circulated among research institutions and university libraries, forming a starting point for relevant researchers. It is a fully informed publication that I appreciated for its clarity and for efficiently developing all topics.

This publication describes past interventions on the Stoa and other buildings in the Acropolis, while evaluating and commenting on those activities and their subsequent results. The critique is objective as it outlines technical issues and faults and explains the actions according to the historical background. Significantly, it is acknowledged (see Eleftheriou 2002i, 41) that without the past mistakes, the current restoration philosophy and the technical approaches would not have advanced. This embraces the idea in that every restoration approach nowadays has evolved from past activities, even if incorrect or unfortunate, and the philosophical thought developed over time.

Furthermore, the committee assessed their interventions, emphasising technical problems. This indicates good practice, since the restorers exercise self-criticism, acknowledging problems and assessing solutions. CCAMAL also proposes its way of handling the anastylosis of the Stoa as an example for other previously restored monuments. This is the first case of publication that refers to problematic situations, giving an insight of possible problems that may be encountered when undertaking anastylosis. Certain aspects are clarified and examples are provided, making them known to the scientific public and providing the opportunity to experts to discuss the emerging issues. As theory is well-known and followed, the success of anastylosis projects depends on the problems presented because of the individual needs of each monument and circumstantial matters – either technical approaches, organisational matters, or application of theory in practice – that affect the implementation of the project and the ways in which these were resolved.

4.3.1.2.3 Issues arising from the project

The interventions have a clearly saving character, as they do not extend to the whole monument but only to its restored parts, especially the colonnades that present static problems (Eleftheriou 2002d, 107). This entails that anastylosis may also be considered as an intervention with a saving character. As shown in this case, it also includes conservation and structural restoration. For instance, application of plaster in both new and original parts (fig. 118), a practice quite common in antiquity and originally employed in the ancient Stoa too, is undertaken for reasons of protection against deterioration. Anastylosis has been chosen in order to halt the deterioration suffered by the monument and caused by both natural phenomena and human intervention.

In addition, structural and architectural members belonging to the building but which have not been re-integrated are stored in the vaults under the Stoa. Hence, anastylosis does not always entail re-assembly of all available members, if they cannot be identified or if they are in a state of preservation beyond repair. Thus, anastylosis can be regarded as a method that either encompasses every kind of intervention to a monument or that it is employed in combination with other interventions or non-interventions.

Notably, the 1930's fragmentary anastylosis of the Stoa is praised by the current restorers (see Eleftheriou 2002i, 44) who recognise that the monument would not have been preserved otherwise. The current anastylosis follows the past one in that no intervention is planned, unless absolutely necessary, in parts not previously restored. The reasons are the lack of sufficient surviving material in those parts and the decision to implement anastylosis rather reconstruction, due to a preference towards a less interventive approach. This is significant as it implies that anastylosis is regarded a minor intervention.

Nevertheless, the above comments and the following of Article 15 of the *Venice Charter* – according to which reconstruction and introduction of new material are refuted (Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171) – come to contrast to what is claimed by Filimonos-Tsopotou and Eleftheriou (2000, 3). Specifically, they maintain that the process is more a reconstruction rather than restoration because only a small percentage of ancient material is re-used. Though it is interesting that some conclusions can be reached as to what anastylosis is considered to be, these exact conclusions are contradictory. By preferring a less interventive approach and, thus, choosing anastylosis, anastylosis becomes a minor intervention. Yet, the restricted amount of original material that is re-assembled makes the process a reconstruction. The only conclusion that can be reached is that anastylosis is considered as an intervention that requires the maximum re-assembly of original material, irrespectively of whether it is implemented as such or not.

It should also be underlined that the quantity of original material currently re-assembled on the monument is not clear (figs. 128-130, 132, 133, 135, 138). It seems that a great amount of new material is utilised, especially in the entablature and in a few columns. For instance, some columns seem to have been reconstructed only to re-assemble their original capitals. Moreover, studies of the Acropolis monuments, as confirmed by Filimonos-Tsopotou and Eleftheriou (2000, 3), show that more original material was used in the past restoration or was found dispersed around the site but not all surviving material is currently reintegrated due to their deterioration. The restorers mention that the amount of new material utilised in order to re-assemble surviving members is quite large; hence, they do not consider the intervention as anastylosis but rather a reconstruction. This relates to whether the quantity of original and new material establishes the extent and, thus, defines the undertaken intervention. As a consequence, it could be worth exploring whether a specified amount of new and surviving material should be established in the framework of anastylosis. This issue, raised in almost every case, becomes even more complicated when the monument has been previously restored, i.e. the monuments of Acropolis of Athens, or if it survives in a bad state, i.e. the monuments of Epidauros.

Additionally, sufficient material survived before the anastylosis of the 1930's, but it proved to require more new material than originally expected (see Eleftheriou 2002i, 42), therefore it was assembled in non-original locations, as that required fewer completions. This generates the question of whether members should be re-assembled in original or not locations. Generally, efforts focus upon assembling members in original locations and then, if these positions cannot be established, random assembly follows. The ideal situation would be to re-assemble all surviving members to their original locations without introducing more new material than what is absolutely necessary, as this ensure authenticity in design and form. If that is not feasible, then matching locations could be the next step, after examining the role of each member – evidently, they should be simple structural elements without particular features that, if assembled in non-original locations, will not falsify the form of the building. Thus, a certain degree of flexibility may have to be observed if it would result in employing more original material than otherwise possible.

Re-assembly of members in a bad state of preservation may also necessitate introduction of additional new material. It may also affect the structural stability of the building, as it could lead to strengthening joining points with further connecting material. Thus, the extent of intervention will increase and it will have an impact on the authenticity of the monument and its material. Consequently, technical examination and theoretical consideration is needed for deteriorated members and fragments. Some material of the Stoa is quite deteriorated (figs. 138, 139). It would seem preferable to integrate it in the structure, rather than letting it deteriorate further on the ground or keeping it in a museum or warehouse. However, extensive interventions for achieving its integration are not desirable; thus, everything should be carefully considered without resorting to extreme choices.

A certain degree of difficulty is also presented when identifying original members and their exact location in the monument and when re-assembling them, as its restorer confirms (see Eleftheriou 2002d, 109). Therefore, extensive testing of structural elements is carried out, a solution that forms the safest way of deciding which members and fragments belong together, even though their heavy weight makes it quite difficult. Such methods may become possible in the future through virtual representations of members or fragments. These representations can recreate structural elements in virtual reality and test their location on the building. Recently, such technological advances are employed (see Sagalassos Nymphaeum) and, hopefully, it will only be a matter of time before they become widely available. The emerging issue is that is the proof that multidisciplinary approaches – such as information technology – are necessary for ensuring successful anastylosis planning and implementation.

Finally, what should be commented upon is the choice of integrating into the upper structure architectural members extracted from recent buildings in which they are found in second usage (see Eleftheriou 2002i, 35). In this case, the choice is straightforward, as the structures from which they are extracted are quite recent, so not many values are attached to them. This issue frequently surfaces, as shown in the Avaton anastylosis. If a conflict of values emerges, thorough assessment of values and the possibility of finding an acceptable compromise would offer the best solution.

As far as establishing whether the proposed intervention is followed accurately, this is difficult to assess. The anastylosis is not completed yet, some observations can be made, but in practice any judgements cannot be as accurate as it is desirable. Generally, the image of the Stoa agrees with the description of the undertaken actions.

The Stoa is a monument that has been restored in the past and that should always be borne in mind when exploring the issues of the current anastylosis. The monument presents different needs and requires diverse operations for its safeguarding, as it is confirmed by its restorers (see Eleftheriou 2002d, 107-108). For instance, partial anastylosis and other interventions are only undertaken in its already restored parts, similarly to the monuments of the Athenian Acropolis. The technical actions are different and the theoretical framework has been developed depending on the problems presented by the monument. Additionally, considering the gap of time in the two projects, the noted different approach to theoretical and technical aspects of the works is conformed to the different attitudes of monument preservation during the past century.

Regarding the management of the archaeological site, no published documents account for its existence. Therefore, not much can be commented upon, apart from the fact that it is almost impossible to proceed with restoration programs, without having a general overview of the future of the site. Yet, no information indicates otherwise. Although interventions are planned and implemented to other monuments on the site, plans and provisions for visitors or the future maintenance of the monument do not appear anywhere. Furthermore, a management plan should be based on establishing the significance and the values of the monument and the site and, as shown above, only references to values have been made, without further analysis or exploration of them.

The organisation of the work-site is exceptional and is presented analytically within the anastylosis study (see Zervoudaki 2002, 6; Pikoula 2002c, 183-187). Its aim is to cause minimum disturbance to the visitor flow within the site, without machinery protruding and imposing itself upon the monuments. The work-site that is located within the Acropolis is visible, as expected, but it does not interrupt the circulation of visitors nor does it impose on our view of the monument. Planning the anastylosis in six stages is also designated as a provision to cause minimum interruption to the site.

Such provisions are also encountered in the Acropolis of Athens, providing an excellent example in the diversity of aspects that site management should deal with.

Some problems worth referring to are the lack of funding and appropriate personnel (see Eleftheriou 2002i, 47). These delayed the anastylosis for about 10 years, even though the monument was in immediate danger and further destruction could have possibly had happened. Hence, it is important to devise ways in which our archaeological heritage will not be in danger and care for it will be available when necessary. Realistically, this is difficult to happen, as not much funding is generally available for cultural programs. This is also why many countries depend on tourism to provide the money for preserving their heritage, which, in turn, may lead to imposing presentations and full reconstructions in order to appeal to tourists. Thus, a circle is created which could influence professional approaches.

The restorers also inform us that two anastylosis initially drafted were considered inadequate (see Zervoudaki 2002, 5; Eleftheriou 2002i, 46-48), so a third one was planned after consideration of the aims of the intervention. Structural or morphological problems had to be solved while the educational and historical values of the monument played a significant role too.

Regarding the educational values of the Stoa, the committee admits that the form of the monument responds to the demands of modern society for educational benefits (see Eleftheriou 2002d, 109). Generally, education is prioritised in interventions and stirs debates as to what extent it should enforce monument restoration. Here, educational values appear to remarkably influence the conduct of anastylosis and its extent. Only a simple reference, rather than further exploration of the matter is made.

Related to the educational values is the issue of improving the legibility of the monument and the ways in which this affects its authenticity. Improvement of legibility elevates the monument and its scenic layout in accordance to the concepts of the Hellenistic architecture. Similar was the objective of the Italian restoration. Yet, the monument is presented in a fragmentary way, which is neither authentic nor does it recreate the building. It rather provides an idea of how the monument may have looked. No matter how faithful the anastylosis is, the monument will never be the original, despite the restorers emphasising authenticity issues (see Eleftheriou 2002d, 107-110; Pikoula and Papadimitriou 2002a, 171).

An issue strongly linked with the above is aesthetics. The current restorers judge the Italian interventions as aesthetically successful (see Eleftheriou 2002i, 44), despite the emerging technical problems and the noted inaccuracies. The monument appeared harmonious to the non-specialist public and was represented in accordance with the scenic display of Hellenistic architecture. The current anastylosis of the Stoa is not completed yet; but so far the result could still be aesthetically successful as the monument is presented without strong differences in colours of new and original material because its anastylosis deals with the emerging technical problems and does not change the form of the building. However, a closer look at the restored parts shows many morphological discrepancies between distorted original members and integrated new ones. Still, aesthetics is an issue exposed to subjective judgements, while in cases such as the Stoa, where the intervention is oriented towards correction of past mistakes, the meaning and fulfilment of aesthetics becomes an even more problematic matter.

Another important issue arises from a comment made by Eleftheriou (2002i, 45) who states that the Italian anastylosis was addressed to a *dead monument*, because in Italy, interventions to a dead monument had a specific theoretical framework characterised by minimum intervention and conservation actions. As it has been commented upon before, the notion has been abandoned in architectural conservation and restoration. Yet, a certain truth in the initial concept should be acknowledged. Despite monuments being constant reminders of our past and form our heritage, which is still valued and preserved for the future – hence, they are in a way *living* monuments – there are still distinguished into monuments that belong to a past and distant culture and those that still form symbolic representations of cultures and religions, therefore, their preservation is essential for achieving these symbolisms. For instance, the Stoa belongs to the classical/Hellenistic civilisation and nowadays is not used in its previous function (a public space used for the gathering of people). It forms part of an archaeological site. It does not need to survive in an absolutely perfect form to represent its initial function; that is indicated by its anastylosis. On the other hand, temples in eastern countries, such as Japan, China and so on, are still part of the religion that is currently dominant among people. Therefore, they should be in perfect state for fulfilling the reason of their existence; so, full interventions are needed. It is in this sense that the concept becomes useful for restorers and guides them in deciding the extent and manner of intervention. But this should be acknowledged of being achieved in a single level only, the primary decision on intervention. Given the latest theories of heritage management and conservation, decision-making is not as straightforward.

What should be further discussed is that the aim of the Italian restoration focused on preserving the Stoa as archaeological heritage to legitimise the Italian conquest of the island. Only what it represented and how that could be interpreted and presented in order to facilitate political motives were crucial. Hence, political legitimisation was directed towards appropriating the past of the island and supporting 'national pride' (see Papadimitriou 1988, 170), by promoting the Greek-Roman idea and establishing the conquerors in the area. This explanation provides an insight into the political motives of restoration and anastylosis. Since these restorations belong to the past and have become history, it is easier to exercise criticism and be direct in our judgements. Politics is a sensitive issue and current politics are even more sensitive. Hence, it becomes impossible to exercise criticism or extract some truth on their impact on certain actions, in particular, interventions in heritage and the reasoning behind it. The current intervention on the Stoa does not have any direct political motive. Greece is an independent country that does not need to legitimise its heritage. Still, a certain preference is directed towards classical heritage, indicated by the amount of effort and money placed upon its preservation (the five committees working so far in anastylosis projects in Greece are dealing with classical monuments only). This tendency could only be explained by the gravity placed in preserving classical heritage as the most significant in the history of the Greek nation, in a time when the cultural diversity of each country is highly valued.

An issue that should be highlighted regards the involvement of foreign expeditions in countries that cannot provide for their archaeological heritage. Such expeditions may prioritise different values and aspects in their undertakings, and that was quite frequent in the past. For instance, the Danish expedition appears to have had archaeological research as their priority and only proceeded in small repairs while the Italian one had a political agenda that dictated the interventions. Yet, people interested in heritage are never informed, let alone consulted of the projects.

On the other hand, public involvement and information does not necessarily occur in contemporary times either. In the planned interventions in the Lindos monuments, the public and the local people are mentioned nowhere and there seem to be no plans for informing or involving them. The information addressed to them is minimal – only a sign and a notice board are found in front of the monument, and some more detailed information in the vaults (figs. 144, 146). There are no indications of improved interpretation. Major objective is the care of the monuments in question, rather than the way they are perceived and valued by the public. This is apparent in all case studies examined so far. In an era where values and public involvement in conservation and management decision-making and when education and improvement of legibility address the public, it is at least worrying that no efforts are put towards the visitors and locals, their perceptions, and their understanding and appreciation of heritage.

The advantages and disadvantages of the intervention are found in exactly the aims it seeks to achieve – halt of deterioration, restoration of static sufficiency, and improvement of morphological restitution. The overall result so far is not much different compared to the image of the monument before the recent anastylosis. However, the intervention required a great amount of new material while some original material was removed from the monument. This has resulted in the Stoa looking more like a reconstructed monument rather than re-assembled from its original members, despite the admirable technical and scientific actions. Education and improvement of legibility of the structure rely only on its restored form. This results in anastylosis becoming an intervention too ambitious with regard to its educational result, with the subsequent result of extending the degree of intervention to achieve this.

CHAPTER 5: CASE STUDIES FROM TURKEY

Examination of the case studies from Turkey (fig. 148) includes a brief description of each monument and its state of preservation, as well as a detailed presentation of the anastylosis programme. Discussion of the objectives of the restorers and the theoretical framework of the anastylosis follows, together with observations about issues arising from the undertaken works.

Further information and an extensive presentation of the history and the anastylosis of the monuments in question, including full bibliographical references, can be found in Appendix E. A glossary of architectural and archaeological terms is found in Appendix F. Photographs of the monuments and the anastylosis works are presented in Appendix A.

5.1 The Library of Celsus at Ephesus

5.1.1 The Library of Celsus

Ephesus (figs. 149-151), in the Aegean cost of Turkey, has a long history from classical to Christian times. The Library of Celsus (113-116/117 AD) is a Roman building. It had an aediculated façade, with niches embellished with statues (fig. 152). Inside, galleries in three storeys surrounded a hall. In the 4th century the façade was transformed to the back wall of a nymphaeum, which was destroyed by an earthquake in the Middle Ages.

The Library was uncovered in 1903-1906 by the Austrian Archaeological Institute (figs. 153, 154). By 1970, the ground plan was relatively well preserved. The 17m walls were preserved to a height of 7 metres. The inside wall did not survive and the façade had fallen forward. Missing elements, identified in locations in Ephesus and Izmir, were collected. Anastylosis was implemented during 1970-1978 (fig. 155).

5.1.1.1 The anastylosis programme

The intention was to restore only the marble façade (figs. 156, 157), leaving the interior walls, of stone masonry, and space in a ruinous state (figs. 159, 160). Between 75% and 90% of original material was recovered from excavation and museums. Methods were developed using modern devices (fig. 161). Detailed documentation, including photography and drawing, was undertaken. Whenever problems were presented, the plan was altered accordingly (Baker 1994, 24; Demas 1997a, 140; Hueber and Strocka 1975, 11-14; Scherrer 2000, 39; Schmidt 1993, 165-167; Wiplinger and Wlach 1996, 124).

The blocks of the façade were re-erected in their original positions (figs. 155, 162, 163), if they could be determined. Some missing members, specifically column shafts and capitals, were replaced by copies, which had a colour suitable to the marble (fig. 166). Ornamentation was copied only so far as the continuity of form and the original light-shade effect required (figs. 164, 168). Decoration on pilaster shafts was followed in a form similar to the original (fig. 165a). Wall surfaces imitated ashlar masonry. Defects, such as the age of the building, earlier repairs, and tracks of its collapse, remained untouched (fig. 166). Smaller defects were filled in with white cement mortar. Edges and structural lines were carefully restored. Plaster casts of the statues were placed in the four aedicule of the lower storey (fig. 165b). The ancient building was fitted into a reinforced concrete skeleton to secure it against earthquakes. Columns and entablature were re-erected to give the effect of the original building structure and components not able to carry a load were replaced by new elements. Epoxy resin connected structural members and lead plates were put among joined members (Demas 1997a, 146-147; Hueber 1997, 79; Hueber and Strocka 1975, 14; Scherrer 2000, 130; Schmidt 1993, 165-168 and 252-253; Wiplinger and Wlach 1996, 124).

In the first three years, preparatory work included: documentation of material, arrangement of architectural fragments; doweling of broken pieces; preparation of the space in front of the library for the crane; photogrammetrical record of the building; completion of control excavations; geological studies to identify new quarries; mineralogical analysis of marble; dismantling of the remains of the façade; and estimation of the load-carrying capacity of the foundations. From 1973 onwards, the wall of the lower storey was restored up to the architrave; the columns of the front and upper storeys were set in place; the lower storey was erected; the coffered ceilings were placed in position; the back wall of the next storey was rebuilt; and the façade was restored (Hueber and Strocka 1975, 11-12; Schmidt 1993; 166-167; Vetters 1971, 37; 1972, 43; 1974, 31-36; 1976, 40; 1977, 39; 1978, 20; Wiplinger and Wlach 1996, 124).

5.1.1.2 Observations and discussion

5.1.1.2.1 Analysis of objectives, and whether or not they were met

Architectural members were exposed to tourism and nature. Anastylosis would protect the structure and fabric of the monument, as fragments would be set against decomposition, human action, and fires, rather than lying on the ground (Hueber 1997, 78; Hueber and Strocka 1975, 10). This aim acknowledges the negative impact of uncontrolled tourism on a site (fig. 172). If monuments in an archaeological site are not restored, then wear from visitors, who in the best case scenario simply walk around ruins and dispersed members, becomes destructive. Consequently, re-integration of architectural and structural members in the building contributes to their safeguarding and protection against human wear, decomposition, and natural forces. It should be admitted that re-assembly of members in the Library has protected them more efficiently and they have survived in a better state since the 1970s.

The comment that anastylosis can '...make historical building processes comprehensible' (Wiplinger and Wlach 1996, vii) is in accordance with what one of the restorers recently emphasised. Hueber (2002) sustains that anastylosis is a method of looking at and understanding building practices. Anastylosis was further rationalised on the basis of its research value for scholars (Demas 1997a, 140). Indeed, during the works, practitioners had the ability to study in detail the architecture, decoration, and construction of the monument. Additionally, anastylosis contributed in the sense that further research was undertaken on the monument. For instance, Baker (1994) studied the monument as one of the Roman Imperial Architecture examples.

Another objective was that re-assembly of dispersed members would make them better understood by both laymen and experts. Visitors would gain a real insight into ancient architecture, as they want to experience the original figure, function, and importance of a monument (Hueber and Strocka 1975, 10; Schmidt 1999, 64). This has been achieved. The monument rises within the site in a way that its figure and form are easily distinguished and understood. Its architecture becomes clearer. Its legibility is improved. The façade welcomes visitors who walk down the Processional Way (fig. 171) and gives them an idea of how the monument must have originally looked. Still, in order to comprehend and experience it, other ways of interpretation and presentation need to be employed, as it is quite hard to fully understand the function of the building as a library.

In total, I would be inclined to acknowledge that the objectives of the restorers were met. Anastylosis has improved not only the state of preservation of the monument but also its understanding and has enhanced its architectural and research values.

5.1.1.2.2 Theoretical framework of the anastylosis works

The restorers used the *Venice Charter* as their philosophical guide (Demas 1997a, 140; Schmidt 1993, 165). The charter guided the works just six years after its introduction in the international architectural conservation field. Careful examination of the undertaken works reinforces the above statement, although there is no further analysis on how it was followed and which articles were of particular importance to the restorers. This indicates that the need for anastylosis principles is great and restorers, when provided with a relevant guide, follow them and treat monuments with the utmost respect. The *Venice Charter* establishes general restoration principles, as they have emerged from years of restoring monuments and debating theoretical principles. Since a great amount of monuments in the Mediterranean are subjected to anastylosis, specific guidelines could facilitate decisions and processes.

Some principles of the charter, followed in every anastylosis examined so far, will not be extensively discussed here. For instance, enhancement of the values of the monument (Articles 3 and 5) is reflected on the Library being restored as a surviving example of the Roman Imperial architecture. Its architectural, historical and artistic-aesthetic values are annotated with the anastylosis. Obviously, more values can be addressed to this monument, such as its social and cultural ones (see Article 5). They are also enhanced, without this being the primary objective of anastylosis, rather its result. For instance, the monument is used for social gatherings and cultural events (see Demas 1997a, 130).

Another principle refers to the harmonious but distinguishable integration of new parts (Article 12). The employed methods, including suitable colour, original light-shade, preservation of the patina of age, and limitations in the copying of the ornamentation (figs. 167, 169), indicate consideration of the aesthetic result. Some adopted techniques are not encountered in our later examples (the effect of light), whilst others (the patina of age) form a matter of constant speculation among professionals.

The principles of minimum use of new material for additions (Articles 13 and 15) are followed here too. A close look at the monument (figs. 164-169) reveals that most original material was integrated back to the structure, while the newly introduced one is not extensive. This is also confirmed by the restorers who state that the surviving material amounted to 75-90%.

Resource to all sciences and techniques (Article 2) and use of modern ones, if traditional ones prove inadequate (Article 10) are principles strictly followed in this anastylosis. Not much discussion refers to the use of traditional methods and techniques, possibly due to the fact that some years after the *Venice Charter*, it was still challenging to employ new devices and methods for intervention. Nowadays, the challenge is found in the use of traditional techniques, as emphasis is placed on the authenticity of craftsmanship and design. Yet, modern technology is not refuted, if, by adopting it, decisions are facilitated and mistakes are eliminated.

A primary issue to be considered is the collaboration of the disciplines of archaeology and architecture in this anastylosis, in contrast to the multidisciplinary approaches discussed in the recent case studies. The duties of archaeologists and architects were clearly defined and attention was paid to their co-operation (see Hueber and Strocka 1975, 14). However, in this case too, more disciplines contributed to planning and implementing anastylosis. Among them were:

photogrammetry, for recording structural and architectural members before and after anastylosis; and geology and mineralogy, for identification of quarries and production of stones. Collaboration of multiple disciplines in anastylosis had just initiated.

In addition, care for the monuments surroundings as advocated in the *Venice Charter* (Article 6) is reflected in the anastylosis of the South Gate of the Tetragonos Agora and the Gate of Mazaeus and Mithridates (figs. 158), while many more monuments have been restored (fig. 173-176). The need for preservation and elevation of the surroundings of the Library are reasons for their restoration. My personal evaluation of the impact of the restored Library on the nearby monuments is positive. As most of them have been restored too, they create a homogeneous ensemble, in which the Library perfectly adjusts, because it is not raised around ruined buildings. Surrounding monuments are lower than the Library, but this was the intention of the creators of the buildings of Ephesus. The Library restorers acknowledge that they paid attention to the harmonious impression of the scenery (see Hueber and Strocka 1975, 10) and this is obvious (fig. 150). Criticism over the prominence of the Library (see Demas 1997a, 140; Schmidt 1993, 55 and 168) could be dismissed in the sense that further monuments and ordinary buildings are currently restored and that the restoration process at Ephesus did not pause after the anastylosis of the Library.

Respect for the valid contributions of all periods, as endorsed in Article 11 of the *Venice Charter*, becomes slightly tricky in this anastylosis. It is known that the library was altered in plan and function during its history, changing from a heroon-library to a nymphaeum. Anastylosis focused on the initial phase of the monument and its façade (see Hueber and Strocka 1975, 11-14). That was justified by the amount of original material deriving from that part of the monument and the specific historical phase. Additional justifications included the exceptional ornamentation of the façade, which reflects historical, artistic, and architectural values. Consequently, anastylosis was justified on the basis of the surviving material and the values of the monument, despite limitations in their assessment.

Finally, the requirement of the charter for detailed documentation and distribution of published material (Article 16) is certainly fulfilled in this case. The anastylosis of the Library and the research undertaken in Ephesus have been published and circulated around the international scientific community (see Scherrer 2000, 5). That should be praised, as it shows the commitment of the responsible authorities to ensure dissemination of information. As sustained by the representatives of the Austrian Archaeological Institute (see Koester 1995, xvii), limitations are found on the fact that information is mainly in German. Hence, in the most recent publication a revised edition in English has been included. This highlights the problem of the accessibility of information, because not every researcher or interested person will be able to read all possible languages. It was a main impediment during my research, because the majority of publications on the Library are in German. I had to heavily rely on some published material in English that was not as exhaustive or detailed. In this regard, translated publications would provide the desired amount of information to everybody.

5.1.1.2.3 Issues arising from the project

Tourism seems to have been a driving force for this anastylosis, as well as for extending restoration works to other monuments of the site (see Demas 1997a, 142; Hueber 1997, 21; Hueber and Strocka 1975, 10-11; Schmidt 1993, 168; 1999, 64; Wiplinger and Wlach 1996, vii). As seen above, improvement of the legibility and preservation of the monument were the major objectives of the restorers. Both these aims are addressed to visitors, yet, tourism did not dictate the extent and amount of restoration. Anastylosis of the Library was planned and implemented by its restorers with the aims of protecting the monument itself and enhancing its research values. It became the most famous of all undertaken restoration activities in the site and it certainly attracts increasing numbers of visitors every year. Professionals have become gradually concerned about the future of Ephesus, because problems are caused due to the inability or lack of consideration of exercising some control over tourism. With restoration and anastylosis taking place without real planning and management consideration, uncontrolled tourism (figs. 171, 172) became the major destructive force of the site, depriving it of its sustainability. The importance of planned management, according to the needs of the individual monuments and the site in which it is found, becomes clearer with time. It is also never too late to consider a management plan, in view of the further destruction that may be caused to the site and the monuments by its absence.

This is one of the few monuments examined so far, where notice boards with information about its history, archaeology and the anastylosis can be found in its interior space (fig. 170). Those interested to learn about the monument and its modern history are provided with some information, which is still minimal and does not cover demands for interpretation for the public. Further means could have been employed, such as more diagrams, photographs, and so on. In another note, the notice boards are found in the interior of the monument, so they do not detract from the restored façade.

The impact of this anastylosis to national identity should also be examined. Anastylosis of the Library was not designed with that in mind, but the final result is certainly 'exploited' in this regard. The use of the Library as a symbolic link between Europe and Turkey, mainly through tourist campaigns (see Demas 1997a, 131), confirms the function of monuments as national symbols in order to reinforce the identity of people or advance political goals. On the other hand, anastylosis has given possibilities for the country to perform social gatherings and cultural events in the monument (see Demas 1997a, 130). As such, the local and national population is given the opportunity to enhance its cultural identity and appreciate the monument.

Further to that, the monument was excavated and researched in the beginning of the 20th century, but the decision for anastylosis was not taken until the 1970's. It is not known why this happened. Monuments should be preserved after excavation, otherwise they are subjected to great deterioration. Various factors may delay the implementation of anastylosis, such as lack of resources in terms of infrastructure, finance, and personnel, together with bureaucratic matters. Consequently, the importance of an organised plan for the site that includes excavation and research and provides for conservation and anastylosis for its monuments is highlighted.

Extensive archaeological and architectural study of the monument preceded anastylosis, just as the *Venice Charter* requires. The study was changed when problems were raised in the course of works (see Hueber and Strocka 1975, 14). This approach has also been noted in the Greek case studies. It indicates that even a well-prepared plan may need to be subjected to changes and alterations to accommodate the needs of individual monuments and the problems and ambiguities that may emerge.

The anastylosis resulted from the involvement of the Austrian Archaeological Institute in Turkey. This matter has been discussed in relation to the Hellenistic Stoa in Lindos, in Greece. In this case, the foreign school achieved an excellent collaboration with the Turkish authorities, which improves as the years go by (see Scherrer 2000, 5). Involvement of foreign schools in the past was unsuccessful, because the authorities of the host countries were either non-existent or lacking the structure for control and collaboration. Soon these countries established archaeological organisations that controlled the role of these institutions. With time, co-operation of foreign schools with the local authorities produced better results in terms of research and heritage preservation. This is why the Library anastylosis is considered a model for future collaborative undertakings (see Scherrer 2000, 5; Schmidt 1999, 64).

Anastylosis was chosen because of the amount of surviving material from the façade and the completeness of the remains (figs. 156, 157) together with the attempt to indicate the form of the monument and the connection of its members (see Hueber and Strocka 1975, 10-11). The latter forms the argument against the suggestion of simply storing dispersed surviving members in a protected location to avoid their further damage from human and natural forces. Once more, the amount of original material and the willingness to improve the legibility of a monument become the primary reasons for choosing and implementing anastylosis. This is exactly where the advantages of the undertaken intervention are found.

The restorers have also discussed the standards of anastylosis and reconstruction (see Hueber and Strocka 1975, 11), identifying their work as anastylosis. According to them, a partial restoration with original material is an anastylosis, while reconstruction accounts for the 1:1 rebuilding of a monument. In addition, it is explained that the visual difference between the two is the introduction of new materials, that is extensive mainly in reconstruction (see Demas 1997a, 146-147). These ideas are not analytically discussed, but provide an insight in what is considered permissible in these two kinds of intervention and what differentiates them. Hence, restoration of the façade, where most original material existed, is definitely an anastylosis. Reluctance towards reconstruction is identified, as reconstruction is regarded an intervention with excessive use of modern material. A preference towards less interventive approaches is also obvious.

As far as the accuracy of the published data is concerned, it is once again difficult to precisely establish the proposed work that was actually undertaken. In general, there seems not to be any discrepancies. The façade has been restored while the interior has been left almost as found, since not much material survived. Nonetheless, not much information is found regarding the state of preservation of the original material, the completions with new material, and the parts in which completions were integrated.

A significant matter that should be discussed regards the statements about the amount of original material recovered from site excavations and from architectural members transferred to museums. Published information varies, so it is not lucid how much material was preserved. The architect in charge mentions that 75% of members survived (see Hueber and Strocka 1975), and possibly this is the correct amount. Others (see Baker 1994, 24; Schmidt 1993, 165) refer to a 90% of original material. These references to the amount of original fabric do not specify whether this amount derives from the façade only, or from both the façade and the walls. Since anastylosis was limited to the façade, then probably the material derived from that. Yet, consistency is important when implementing anastylosis and assessing its results. This observation is in agreement with anastylosis professionals stressing in the survey (Chapter 6) that percentages of surviving material should refer to volume, mass, surface, and entirety of members. This, again, raises the previously discussed matter of the establishment of a specific percentage of surviving material that would justify anastylosis.

Another issue relates to the re-integration of surviving members in their original or matching locations. It is stated that architectural members were re-assembled only when their original positions could be determined. Thus, there is no compromise regarding their assembly in non-original locations, in contrast to the other examples.

A noteworthy technical matter regards the use of an earthquake-proof reinforced concrete skeleton into which the ancient structure was fitted. Early in the history of anastylosis practices, professionals used this system to guard against damage caused by earthquakes. With the passage of time, it was proved that this system, apart from being exceedingly interventive, it was damaging too. However, technology was not exceptionally advanced to test the possible results of the use of certain materials at that time. However, so far, no structural problems are known to have been presented.

The results of anastylosis of the Library should be further discussed. The monument is judged an 'artificial ruin' (see Demas 1997a, 146-147; Schmidt 1993, 68). That is obviously correct, because the ancient building is not recovered. Original material is missing and the original function cannot be restored. The monument has been restored in a state that has not survived through time. The result is certainly not authentic, as expected, since the form, image, and function of the Library are not restored. Nonetheless, form and image are rather indicated and, in this regard, the anastylosis could be judged as successful.

The comment by Scherrer (2000, 134) about the whole ensemble presented in a form that never existed in antiquity, after excavation and restoration works undertaken in the Library Square, is noteworthy. It forms the inherent question in excavation, restoration and anastylosis works undertaken in archaeological sites. Excavation reveals monuments in a ruined state, but rarely in their original form. Although debates question whether it consists destruction or not, the result of excavation is to reveal these monuments, which otherwise would not have been known. The state of excavated monuments is the state of their preservation or destruction through time. On the other hand, restoration and anastylosis, which mainly aim at pausing deterioration, preserve the monument for the future and present it in a legible state to the public. They seem to be more interventive and achieve a form that never existed in the past. However, we should accept that there is no proper method of presenting a monument in its original form, apart from using modern technology, such as multimedia presentations. Every method of preserving and presenting a monument has an interventive nature. If reconstruction is chosen, then the result is a modern creation. Hence, the only non-interventive action would be to take no action at all, leaving the monument to deteriorate further. Thus, the only choice for preservation and presentation of monuments becomes the modest extent of intervention.

5.2 The Temple of Trajan (Trajaneum) at Pergamon

5.2.1 The Temple of Trajan (Trajaneum)

The temple (2nd century AD) is situated on the upper acropolis (fig. 179) of Pergamon (figs. 177, 178). It stood on a platform, which was artificially created with vaults and retaining walls (fig. 180a). It was peripteral, of the Corinthian order, built with white marble, and surrounded by stoas on its three sides (fig. 180b).

Excavations were carried out in the 20th century on behalf of the Berlin Museum and many sculptural elements were transferred to Berlin. Between the 1960's and the late 1980's, the German Archaeological Institute undertook anastylosis of the Trajaneum, and development of the site presentation with the co-operation of the Turkish authorities. The substructure was preserved fairly well but, after the front sections of the vaults collapsed, it was filled with debris and building stones. On the hillside, marble blocks were protected by earth accumulations. On the west, the terrace vaultings and the building had collapsed. On the east, the platform was preserved to a greater extent. The north wall did not survive in full height and the ashlar of the northern stoa had been destroyed. The wall of the valley-side was found in good state. In total, a great number of elements survived.

5.2.1.1 The anastylosis programme

The temple was theoretically reconstituted with archaeological and architectural investigations and meticulous documentation, including photogrammetry, and from fitting together broken parts and checking their sequence (Nohlen 1985, 149-150; 1997, 188-191; 1999, 94).

In the substructure, the ancient building style was followed. Broken vaults were consolidated up to the ancient construction joint over the passageway (fig. 181a). Missing parts of the vaults were set using rubble stones and mortar fill, similarly to the original. A 'red joint' of mortar distinguished new stonework (Nohlen 1985, 154-158; 1997, 154; 1999, 93; Schmidt 1993, 174-175).

Stone members from the upper structure were cleaned form dirty crusts and lichens. If they yielded sufficient information, they were joined together and restored to their original position, provided they could give precise indications regarding the structure. Epoxy resin was used as glue. Rods of titanium-stabilised stainless steel were drilled in (fig. 182a); the drill holes differed in depth, so as not to strain the marble. In higher elements, which are not subjected to tension, fibreglass was employed to minimise the risk of lighting. Missing parts were completed, only where necessary, by artificial stone of crushed marble and white cement. Breaks and small defects were left visible (fig. 183a, b), in order to retain the signs of age. Only profiles and major features were indicated (fig. 183c), completing basic lines but not competing with the ancient ornamentation. Experimentation proved that it was important to reconstruct entire forms. Casts were used in a few cases for structural elements of identical form. Flutes were added to new column drums; they were worked on after the assembly of drums (fig. 182b). The material was skilfully worked to yield a lively surface. Advanced technology facilitated shifting and re-assembling members without damaging them and their ornamentation (fig. 185) (Nohlen 1985, 147-158; 1997, 191-194; 1999, 91-98; Schmidt 1993, 174-179).

Structural parts work as independent blocks. However, missing connections to rigid elements necessitated strengthening of certain links, with newly inserted connection dowels. The re-erected columns are not connected with internal constructions, as in antiquity. Since the columns are incomplete, the building cannot rely on the original system but has to be stable. Safety measures against potential earthquakes were taken with the view that, in such a case, the steel would reach breaking point before the elements collapse, but will not be shattered (Nohlen 1985, 159; 1997, 194; 1999, 99; Schmidt 1993, 175-179; Starosta 1999, 89).

Stairs and paths lead through the site. Information is available to visitors (fig. 186). Members not reassembled are arranged as an on-site exhibition (figs. 187, 188). The work-site was arranged east of the temple and included workrooms for draftsmen and stonecutters, together with depots for ceramics and stones. Scaffoldings, trucks, cranes and smaller devices formed a sophisticated technology, which was obstructive but carefully operated (Nohlen 1985, 146-159; 1997, 194-195; 1999, 99-101).

The silhouette of the re-erected sections follows the slope of the hill. The temple was divided into two sections (figs. 181b, 184, 189, 195, 196), leaving the western part almost un-restored (figs. 190, 191). An exception was made for three columns of the western stoa, so as to indicate the width of the terrace. Restoration concentrated on the eastern section (fig. 192). The wall of the hall was rebuilt with artificial ashlars. A row of columns was placed above the eastern temple court and opposite the temple pediment. The north and east stoas and the north-east corner were restored to full height (Nohlen 1985, 159; 1997, 191; 1999, 97; Schmidt 1993, 174-176).

5.2.1.2 Observations and discussion

5.2.1.2.1 Analysis of objectives, and whether or not they were met

The main aim was identical to the international meaning of anastylosis, the re-assembly of existing by dismembered parts of the monument (Nohlen 1999, 101). Interestingly, this is the first case examined so far that this objective is encountered. The deriving conclusion is the confirmation of the meaning of anastylosis as a specific type of intervention to monuments. Obviously, re-assembly is not a sheer aim, as it entails diverse gains, such as protection and presentation.

According to the restorer, anastylosis served various research aspects, with regard to archaeological and conservation investigations, systematic documentation, and understanding of the construction process (see Nohlen 1985, 145; 1997, 189; 1999, 101). The result was a large quantity of information regarding the monument, such as its architecture and construction and its later use and destruction. Anastylosis is, thus, closely connected to archaeology, architecture, structural engineering, and conservation, depending on the problems presented by individual monuments. Consequently, in order to apply this intervention, diverse investigations were meticulously undertaken and relevant research was enriched. These aspects of anastylosis should never be ignored in its implementation. It is not surprising then that the restorer describes anastylosis as ‘a window in the history of monuments’ (Nohlen 1997, 190).

Additionally, by restoring architectural elements to their original places they would be protected against deterioration, decomposition, wind, rain, humidity, root spraying and vandalism (Nohlen 1985, 145; 1997, 188-196; 1999, 101). As noted in other examined cases too, a major argument for anastylosis is the protection of architecture, since surviving elements would not lie dispersed around the ruined monument and its surroundings. Apparently, the re-assembled members have since been better protected. Many members not assembled on the monument are organised as an on site exhibition, though this has proved a major impediment to their protection, as noted by Hoepfner (in CCAM 1995, 207). In the Trajaneum, protection of the ruin partly argued the anastylosis and contributed to the greater discussion over the aims of anastylosis in relation to preservation. In addition, restoration of the substructure aimed, not at completeness, but at ensuring lasting preservation and safety of workers and visitors in the area (see Nohlen 1985, 155). Accessibility for the personnel in order to work on the anastylosis of the temple and of the visitors in order to safely wander around the monument was a significant consideration.

The anastylosis was also related to the presentation of the temple and the conducted research. As Nohlen (1985, 145-168; 1997, 188-196; 1999, 99-101) confirms, visual guidelines for visitors would be provided, so that they would understand the proportions, dimensions, construction and decoration of the monument, as well as its location in the site. Indeed, the connection of architectural members has become clearer and recovery of the third dimension has been achieved, while the archaeology of the monument is effectively presented. This forms a significant issue raised in monument conservation, as presentation is a major objective of restoration. Besides, research becomes of equal importance with preservation and indicates the orientation of current approaches, which are focused on enhancement of presentation for scholarly reasons and for the visitors' apprehension of archaeological heritage.

Interestingly, the improvement of the legibility of the monument has been openly discussed by the restorer and site manager (see Nohlen 1985, 144 and 168; 1997, 186 and 191; 1999, 91 and 101). Visitors are not expected to understand and appreciate a ruined monument. They are not confronted by a fully restored monument either. There was no need to provide them with a set idea of the original form of the

Trajaneum. What was sought was motivation of their imagination to compose the monument within the site, as well as guidance in the field of Hellenistic and Roman architecture. No arguments for educating the public through anastylosis were advocated. The public was not underestimated because of their lack of architectural knowledge. The aim was, and it has been achieved, to give indications, acknowledging that scholarship does not have all answers, but can assist in answering most questions and encourage further involvement in acquiring knowledge and understanding of monuments.

Turkey, and many other Mediterranean countries, relies on tourism for increasing the income of the country. It is not surprising that monument preservation also aims at promoting tourism. According to the restorer, anastylosis was a gesture of gratitude and economic help from the German Institute towards the country for the provided research opportunities. Additionally, the Turkish government probably requested restoration for the better presentation of the monument, so as to create a reason to visit the site, and, consequently, increase tourism (Nohlen 1985, 144-145; 1997, 185-186; 1999, 92). Thus, tourism and financial reasons played an important role and can be identified as major driving forces for this anastylosis. Yet, they did not directly influence the restorers nor did they deduct from a professional approach to anastylosis. While financial reasons influenced decisions, their impact on anastylosis decisions was minimal, apart from certain aspects, such as the choice of stone, which took into account less expensive solutions (see Schmidt 1993, 179).

In general, the aims and objectives of the restorers were met. Members were re-assembled in the original location on the monument, archaeological and architectural research was evidently enriched, the previously dispersed members have since been better protected against human and natural forces, the Trajaneum has certainly become more legible, whilst visitation to the monument is quite high.

5.2.1.2.2 Theoretical framework of the anastylosis works

The Trajaneum restorer states that the 20th century restoration principles were followed (see Nohlen 1997, 185). However, the *Venice Charter*, though a valid conservation document, is not mentioned anywhere. That is striking since all principles guiding the works can be identified with the principles of the charter. In direct observation of its principles reflects their validity and their representation of the current restoration philosophies.

Among them is the collaboration of a wide range of disciplines, as Article 2 of the charter is interpreted recently. Such disciplines were archaeology, architecture, ancient history, conservation, civil engineering, photography and illustration, while skilled stonecutters from Germany assisted in training the local workers (see Schmidt 1993, 174). Nowadays, discipline collaboration has progressed, compared to past projects, while the disciplines themselves advance as time goes by. Their methods and technologies develop, providing better results. This is encouraging for achieving successful results in technical matters at least. Another point to be made regards the employment of marble workers and the importance of their training, an approach similar to the one noted in the anastylosis of the Parthenon and the Erechtheion.

Related to the above is Article 10 of the charter about the use of new and traditional methods and technologies. The statement that availability of modern technologies was a great incentive for undertaking anastylosis (see Nohlen 1997, 185; Tuna 2001, 10) could be interpreted in the sense of facilitating the planning and undertaking of the works. For instance, the use of photogrammetry assisted in accurately measuring and documenting surviving members and supplemented the documentation. It tackled problems deriving from the unavailability of information, which was due to the incomplete records of the past interventions. Modern technology made further possibilities available, such as the production of artificial stone for completions as a compatible material.

On the other hand, attachment to ancient working methods and techniques should be highlighted, especially in working on the columns (fig. 182b). This can probably be attributed to the recent tendency for respect for the authenticity of workmanship. Modern technologies were mainly employed for works that had to be executed carefully, such as the shifting and re-assembly of members (fig. 185). Thus, it would be safe to assume that ancient methods were employed for anastylosis procedures whose final results are obvious and affect the ancient fabric. New technologies were used to facilitate works that would not have an impact on the fabric, but ensured its safe handling.

Another principle of this anastylosis in accordance to Article 9 of the charter is that any conjecture regarding the architecture or structure of the temple was avoided. When sufficient information did not exist, a possible solution was suggested or they built nothing at all (see Nohlen 1999, 95). The above approach should be acclaimed for its respect for the monument itself and its authenticity, which will be discussed in more detail below.

Precise investigation of the building before anastylosis is a prerequisite of Article 9 of the charter. In this regard it was stated that research and anastylosis would not be separated from each other (see Schmidt 1993, 174), indicating that both disciplines are so closely connected and dependent on each other. Their relation is self-evident, as investigation leads to results on which anastylosis is based while anastylosis reveals far more information on the building rather than simple archaeological and architectural research.

Respect for the valid contributions of different times in the history of the temple is in accordance with Article 11. The Trajaneum is a Roman monument that gradually reached a ruinous state and was buried until its excavation in modern times. In the substructure, Byzantine elements were discovered and preserved as an indication of the later history of the temple (see Nohlen 1985, 155; 1999, 93). Since historical elements were found only in the substructure, there were no problems about which elements should be presented in the anastylosis of the upper structure. Difficulties may emerge when the decision should be made regarding the choice of restoring a specific period in the history of the monument.

Differentiation rules also followed the principles of the *Venice Charter* (Article 12). Yet, there was more concern about differentiation rather than integration. Two different approaches were employed, one for the substructure and another one for the upper structure. Everything was decided after careful consideration of available options and choices were balanced. As a consequence, new materials are easily distinguished from the old but the visual continuity of the structure remains unharmed. Yet, a close look reveals a quite contrasting image between new and original materials. Although, respect for the ancient ornamentation and the choice of not imitating it is noteworthy, the result is quite striking to the eye of the visitor.

The documentation appears to be of high quality, according to the restorer, who sustains that it includes exact measurements, drawings, photographs, photogrammetrical records (see Nohlen 1985, 145-150; 1997, 188; 1999, 94). The aim was not only to plan the anastylosis but also to illustrate the scientific text and to clearly present the monument. Hence, the requirement of the Article 15 of the charter was fulfilled. Of course, these scientific texts are not easily accessible, they are found in the archives of the German Archaeological Institute. Acquisition of information was achieved due to the amount of published material in established academic journals. However, there is no exhaustive publication of the monument, rather accumulation of assorted articles.

On the other hand, the past documentation attempts were judged inadequate and resulted in restraining the abilities of the recent restorers (see Nohlen 1985, 150; 1997, 188; 1999, 91-94), because they were unaware of the location of not documented structural parts. In the past, documentation techniques were not advanced. Absence or inaccuracy of records has been discussed with regard to the inadequate documentation of the Italian exhibition in the anastylosis of the Lindos Stoa, highlighting the importance of exhaustive records.

5.2.1.2.3 Issues arising from the project

In the 19^{th} and 20^{th} centuries, three excavation expeditions took place without the involvement of the Turkish government. Later, archaeological and restoration works were the outcome of co-operation between the two countries. A German committee controlled and supervised the implementation of anastylosis, bringing advanced technologies and methodologies, as well as the funding to realise the works. The Turkish authorities had the final word and were continuously represented throughout the project. This kind of collaboration is excellent, since the Turkish state might not have been able to preserve the monument. Utmost respect and care were shown in this intervention, reinforcing the idea of a common heritage respected by and cared from everybody, irrespectively of their connection to it.

The anastylosis of the Trajaneum is only part of a conservation and management process of the entire site of the Pergamon. However, no information is available. Various publications regarding the archaeological research and occasional restoration interventions on the monuments of the site are rare.

Furthermore, not much care for the surroundings of the Trajaneum, especially the nearby Library and the Sanctuary of Athena, which are preserved in their foundations (see Nohlen 1985, 146), seems to be shown. Yet, the partially re-erected temple integrates better in the site, since most of the monuments in its immediate vicinity are ruined. Only a few monuments survive in a fairly good state. But so far, there is no planned restoration or site presentation. Hence, the contrast created among the partially restored monument and the rest of the site is quite striking. Certainly, more attention should be paid to the presentation of the site and that can be part of a general management plan for the Pergamon. This plan could also assess the values attributed to the monument itself, as well as to the site. In my examination of the anastylosis works at the Trajaneum, no reference to values has been made.

During the course of anastylosis, the work-site was efficiently organised, with provisions for every kind of research that would be undertaken and for the safety of the visitors. This shows consideration for organisation and respect for people involved in the project, and is indicative of the importance of organisational matters.

Within the vicinity of the monument a series of notice boards provide information for the visitors (fig. 186). This information is well-presented with photographs and diagrams, while text is given in three languages (Turkish, German, and English). Despite this being a significant provision for the public, more informative material could be employed in order to achieve thorough presentation and interpretation of the monument. It should also be noted that the decision on anastylosis of the Trajaneum, and even for presentation of the site, was a matter concerning only the German Archaeological Institute and the Turkish authorities. The public, neither the locals nor the visitors, is not mentioned anywhere, even though anastylosis aimed at improving the legibility of the temple.

The amount of surviving material was the factor that determined the kind and extent of the intervention (see Schmidt 1993, 173-174). Since, it did not derive equally from all parts of the monument, anastylosis was implemented only in those parts where the preserved material allowed it (figs. 190-193). This is why the western side of the temple was left un-restored. The solution is similar to the one adopted in the Celsus Library, where only the façade was subjected to anastylosis. The new material to be integrated was decided after consideration of architectural and structural reasons, having minimum intervention as the guiding principle.

Restoration works at the Trajaneum are clearly described as anastylosis (Nohlen 1999, 101). The anastylosis definition is strictly adhered to and followed, as well as the main restoration principles, with special emphasis to the individuality of structural members. Differences between anastylosis and reconstruction are lucidly explained, based on the amount of surviving material and how that determines the intervention, as well as on the extent of the engineering solutions (in anastylosis engineers employed methods for stabilising the structural system rather than altering it). Those differences became easier to understand, after a proposal for a reconstruction was rejected (see Nohlen 1999, 101) and anastylosis was planned. Thus, anastylosis was promoted as a less interventive approach with defined limits and principles, the most important being the re-assembly of surviving architectural and structural members in their original location.

Due to the partial anastylosis, a great amount of structural members not included in the anastylosis, were arranged as an on-site exhibition. For instance, the pediment of the temple was arranged so as to show the connections of the architectural elements (fig. 187). It may be argued that these architectural members suffer from weather conditions. Yet, by being closer to the monument, they are in context and their apprehension by visitors is increased. Their arrangement to show the architectural continuation of co-belonging elements of the same typology provides an insight into ancient architecture.

It should be noted that the data provided on the anastylosis works seems to be accurate. Indeed, the western part is almost un-restored, while anastylosis was mainly implemented on the eastern part. As I have previously stated, it is actually difficult to double-check and confirm every individual re-assembly of members. Since access to technical reports is not always possible, the technical details may not be available to check. Additionally, this specialised confirmation is difficult to achieve without a relevant architectural background.

A range of technical aspects of this anastylosis are worth mentioning, even though they have been extensively discussed in the case studies examined so far. Initially, before re-assembly, a theoretical reconstitution preceded and was followed by testing how the broken members fitted together and in which locations. This method ensured that when these members would be re-assembled, their location would be the correct one. It warranted that the least possible mistakes would occur. It does not often appear as a process in anastylosis, except in the Nymphaeum at Sagalassos.

Furthermore, anastylosis was planned with a view of a less engineering approach that respected the independence of structural members. The original static system was stabilised, though it was occasionally altered for safety reasons. This principle indicates respect for the monument itself and the authenticity of the structure. However, it has been proven to be the best method for ensuring the safe behaviour of a building in case of mechanical strains, such as earthquakes. That is always taken into consideration, especially since the Mediterranean region is found in an earthquake zone. The choice of material for connecting members had a specific reasoning. The needs of the building were carefully studied and less interventive approaches that would not alter the static balance were sought. The employed solution was respectful of the static system and as less interventive as possible.

Completion of missing parts was done in artificial stone, after examination of the potential of natural and artificial material. The choice is always a crucial issue. Natural stone was judged cheaper and easier to produce. However, the result of the laboratory experiments indicated that artificial stone would be a better and compatible choice (Nohlen 1985, 157-158; 1997, 191; 1999, 97-98; Schmidt 1993, 174-179). Its synthesis is similar to the stone used in the Athenian Acropolis.

Even though there is no detailed information about the amount of original material that survived and was re-assembled on the monument, the restored structure does not look like extensive new material has been used. A careful examination of the temple (figs. 193, 194), during my visit in 2003, revealed that although the new members are effortlessly distinguished from the original, their amount is not striking or excessive. On the contrary, I would be inclined to say that its integration on the monument is agreeable in the sense that it is apparent how its use facilitated the re-assembly of the well-preserved original material. The choice against full anastylosis also signifies cautiousness and guards against the introduction of too much new material. Thus, it can be safely judged that this anastylosis is indicative of minimum interventions.

The restorer himself confirms that the partial anastylosis depended on the great amount of material that would be needed to re-erect the whole monument. He denotes that anastylosis was planned in a way that would guarantee the understanding that the structure had been re-erected and it would not look as though it was standing there since antiquity (see Nohlen 1985, 146; 1997, 194; 1999, 99-101). Acknowledging that the effect of completeness cannot and should not be objective of anastylosis is better understood in the argument about the aims of anastylosis. Monuments are complete during their life when they functioned in daily lives of people. Anastylosis aims at improved presentation and enhancement of values, rather than recreation of the monuments. This exact idea was promoted through the Trajaneum anastylosis. The form of the monument is indicated, presentation is improved and legibility is facilitated, through intervention. As Nohlen (1997, 195) sustains, ruins should be presented as ruins and not be 'brought back'.

In turn, this stirs the question on the creation of artificial ruins. The restorer acknowledges that the result of the Trajaneum anastylosis was the creation of a modern ruin with its own architectural and aesthetic qualities (see Nohlen 1985, 146). In my personal opinion, this statement is true. The architectural qualities are not much different than the original ones. By looking at the restored monument, we understand more the architecture of a Roman temple rather than if we were looking at surviving members dispersed on the ground. Aesthetics, however, is an issue more difficult to judge. As it is a quite subjective matter, it is also complex to draw a line between what is aesthetically acceptable or not in an intervention. This is the reason why aesthetics should be meticulously analysed and be subjected to constant criticism and speculation by the professionals themselves, as well as the public.

On the other hand, the anastylosis provided the monument with a form it never had. Obviously, there is nothing more or less that we could expect from this intervention. If we were to provide the entire original form and image of the monument we would have to resort to reconstruction, which would be an extensive intervention. If we wished to completely respect the monument as it has survived through time, the only measures possible would be the conservation of members and their storage, in which they would be easily subjected to study and they could be exhibited as individual findings. However, the aims of anastylosis are also connected to improving the legibility of the architecture and make it understandable to the public. Hence, it should be expected that all judgements on the principles, results, and objectives of anastylosis are relative. To achieve absolute respect of the monument, of its authenticity, integrity, and survival through time, it would mean that the temple should have been left as it survived after excavation. Prioritising any of them at the expense of the other should not be an option. A degree of compromise in our processes and judgements of the final result should be expected. Either way, choices should include modest measures and minimum interventions with careful consideration of the aims sought to be achieved.

5.3 The Hellenistic Nymphaeum at Sagalassos

5.3.1 The Hellenistic Nymphaeum

Sagalassos is located north of Antalya in the Burdur province (fig. 197). The Nymphaeum, dated in the 1st century AD, though four different building phases are distinguished, was built against and partly set into a natural slope in the north-eastern part of the city. It is rectangular, built out of stone (fig. 198). Three Doric porticoes, along the west, north, and east sides, enclosed a courtyard. Parapets and walls formed three water basins. The façade had eight Doric columns. The back walls were constructed of dry masonry. In its building phases, the fountain house became a closed water reservoir and, later, an open-air water basin.

The Nymphaeum was excavated in 1990-1991 (fig. 199a) by specialists from Belgium, the UK, and Turkey. It was relatively well preserved. Most elements were present around the building and many others were found settled in successive levels (figs. 201-205). Blocks were fragmented in pieces, with cracks and missing pieces. Some stone members from the original structure were missing, e.g. blocks from the south and west wall and steps from the entrance stair. Most of the pavement had disappeared, apart form some slabs found *in situ*. Parts of the central part of the monument had collapsed. The eastern part of the roof seemed to be *in situ*, whereas its western half had fallen down. In the east and west wings, the back walls were standing but the porticoes had collapsed and their foundations had slipped. Cornice blocks were missing from the north, east, and west porticoes. The west wall was partially destroyed. Removal of blocks and collapsed parts resulted in clearing the courtyard (fig. 200). Excavations were undertaken around the fountain. By 1997, the Nymphaeum was restored to its original function (fig. 198).

5.3.1.1 The anastylosis programme

Hydrographical, geomorphological, and archaeometric studies, studies of the building stones, and investigations of the structural behaviour and construction methods were undertaken. Further excavations provided information about the building history, and determined the water supply system. 3D multimedia tools are developed for guiding anastylosis efforts and for presenting materials and the site. Minor preparatory work included cleaning of the monument and its surroundings, preparation of working zones, and gathering of information (Bisnir *et al.* 1993, 85-87; Cosmas *et al.* 2001, 1; 2002, 1; Degryse 2002, 1457-1458; Patricio 1996, 104; Patricio and Van Balen 1993, 88-89; Van Gool *et al.* 2002, 53-55; Viaene *et al.* 1997, 406; Waelkens 1993b, 38; 1993c, 43-44; Waelkens *et al.* 1992, 81-82; 1997, 110).

Blocks and fragments were sorted out into typological families. A model was established from the part of the building that remained *in situ* with its constituent elements still intact. Extensive surveying of ruined components – topographic, graphic (figs. 206, 208), photographic, and written – was an extended method of information gathering. Once surveying was complete, connections between fragments and blocks were confirmed by experimental joining (figs. 209-210). Work continued with three-dimensional models on a 1:1 scale, built with original and restored material. Conclusions were indicated in the graphic model. Materials used for gluing and completing stone fragments were laboratory-tested (figs. 207, 211). Natural stone was used for completions and additions, only when necessary for structural reasons. Joining of broken fragments was achieved by pinning fibreglass rods, anchored by epoxy grout through cracks. Fissured and flaking stone blocks were consolidated by injecting water-porous glues and sealed with a covering mortar. Restored blocks were cleaned by cold water and biological dirt was chemically cleansed (Ercan *et al.* 1997, 423-436; Patricio 1996, 104-107; Patricio *et al.* 2000, 400-416; Patricio and Van Balen 1993, 88-90; 1995, 143; Van Balen 2000, 213-217; Van Balen and Patricio 1995, 143-166; Van Balen *et al.* 1999, 105-113).

The first phase included gathering information, preparing material for restoration, and producing the theoretical reconstitution model (fig. 208a). The second phase led to anastylosis of some parts (fig. 212). The third phase started with restoration of damaged building blocks. In the last phase restored blocks were placed into position (figs. 198, 213). The architraves of the three porticoes and the cornices of the north and east portico were re-positioned; the west wall was completed with new stones; the basins, parapets, and steps from the west and east porticoes were dismantled and re-erected; the deformations of the foundations were corrected; and the original function of the structure as a fountain was recovered (Patricio 1996, 106; Patricio and Van Balen 1995, 143; Patricio *et al.* 2000, 399-417).

5.3.1.2 Observations and discussion

5.3.1.2.1 Analysis of objectives, and whether or not they were met

A principal objective of this anastylosis was that the monument provided research possibilities for archaeologists. It is in this sense that experts consider restoration projects as necessary for archaeological research (see Sagalassos Project 2002). As it will be shown below, extensive research was undertaken, while the planning and implementation of anastylosis resulted in gathering great amounts of archaeological and other information.

An example of these research possibilities was the achieved restoration of the form and function of the monument (Sagalassos Project 2002; Patricio *et al.* 2000, 399). The anastylosis projects examined so far aimed at restoration of form only. Here, anastylosis was expanded as the water supply system of the fountain was re-established and put into function again. Restoration of the function of the building as a fountain house depended on the possibilities of archaeological and other research on the structure. This is the reason why this objective was considered by Waelkens (1993c, 43) as 'a unique achievement in classical archaeology'. The only other similar example is provided by the restorations of ancient theatres and odeums, so that their original function is reinstated and ancient dramas can be performed.

Another aim of the anastylosis was the historic investigation which led to understanding the building (see Patricio and Van Balen 1993, 87-88). It comprised architectural and historic information and resulted in acquiring knowledge about the architecture and construction of the building. The restorers acknowledge that research on the monument before its reinstatement provided a unique opportunity to analyse and develop scientific knowledge on its architecture and the building techniques. It eventually concluded to understanding the initial concept of its architect and those who intervened over time (see Patricio and Van Balen 1993, 90; Patricio *et al.* 2000, 90). Thus, the knowledge deriving from scientific investigation is exhaustive and led to a well-informed anastylosis project.

Another reason and objective of the anastylosis was the awareness of the historic and aesthetic values of the remains (Patricio 1996, 107; Patricio and Van Balen 1993, 89) and their consequent enhancement. Evaluation derived from close observation and assessment of the remaining material and from detailed and accurate reconstitution drawings. Clearly, anastylosis assisted in augmenting these values. The Nymphaeum is more legible today and its values became easily distinguished. Its history could have been discerned even through its remains, since most original material survived *in situ*, but its aesthetic values are better understood and appreciated after the re-assembly of its dismembered elements. However, assessment of values was limited to only what concerned the building itself. This is a recent project, which should have not failed to acknowledge the importance of assessing the values related to the monument as part of a site and of the life of a community and a country. What is important for the site should have been taken into consideration, whilst the public should have been included in the process.

However, the main principle and objective of the anastylosis was the return of surviving members to their original position with their own structural roles, as well as the preservation of the original structural behaviour of the building (see Ercan *et al.* 1997, 423-424; Patricio 1996, 103; Patricio *et al.* 2000, 399-408; Patricio and Van Balen 1993, 88; Van Balen 2000, 214-215; Van Balen *et al.* 1999, 106-109). Hence, gravity was placed on improving and preserving the structural system. Nothing else had such a dynamic in this anastylosis. Yet, the achievement of this objective cannot be assessed with certainty. The architecture of the fountain facilitates re-assembly of dispersed elements and preservation of the original static system. But, this is a technical matter that should be better judged by experts in the field. Further to that, the success of the implemented works will be proved in the unfortunate case of an earthquake or another mechanical force. In such an occasion, the structural system should behave in a way that will cause minimal damage to the Nymphaeum.

In general, the objectives of the restorers seem to have been met. Enriched research, improvement and preservation of the static system, re-assembly of surviving members on the building, and enhancement of the historic and aesthetic values of the monument have been achieved without major problems in the process.

5.3.1.2.2 Theoretical framework of the anastylosis works

The theoretical framework was governed by the principle that anastylosis should not be considered as a specific theory, but as similar to any other restoration. In this sense, it should correspond to fundamental principles generally valid for restoration. Restorers also sustained that each case must be studied individually, according to the state of preservation of the monument, which, in turn, will determine the amount and extent of intervention (see Patricio 1996, 101-102; Patricio and Van Balen 1993, 87). This is the first case study where the theoretical framework of the anastylosis was discussed from a different viewpoint than the others. Interestingly, anastylosis was not distanced from other types of intervention, but was considered equivalent to restoration. The individual needs of the monument, i.e. its state of preservation, define the way in which it will be implemented. The only difference from any other kinds of restoration is the type of monument. In this case, the answer is 'a totally or partially dismembered stone structure' (Ercan *et al.* 1997, 423; Patricio 1996, 101-102 Patricio and Van Balen 1993; Van Balen *et al.* 1999, 106).

According to the restorers, the planning and implementation of anastylosis was based on restoration principles, technological research, weighted considerations, and technical and methodological actions, as well as understanding of the ruin (see Ercan *et al.* 1997, 423; Patricio 1996, 101-108; Patricio and Van Balen 1993, 87). Preparatory work was a significant step towards this process. It included information gathering from every possible source and formed an effective approach, encouraged by methodological delineation of the anastylosis process. Excavations were carried out and extensive research on architecture, as well as structural investigations led to further knowledge of the monument. The original form and alterations of the fountain house through time were clarified before proceeding with the intervention. It is also highlighted that detailed drawings uncovered aesthetic and historic values and information about the behaviour of the structure. Consequently, the monument was clearly understood. The idea of understanding the structure before implementing an intervention has been recently encouraged through the promotion of the notion of understanding the values of the monument (Clark 2001). In the Nymphaeum, understanding of architectural and structural issues enhanced understanding of historical values. Then, a methodology was developed (see Van Balen 2000, 212; Van Balen *et al.* 1999, 106) in order to systematise the intervention and define its amount, extent, and manner. This methodology, depending on scientific principles and technical procedures, had a systematic approach and became fundamental in the anastylosis planning, minimising possibilities of errors. Hence, the anastylosis project was thoroughly informed, planned and implemented. This practice is undertaken in most anastylosis projects, yet, its conduct varies in each case.

Interestingly, there was no speculation and questioning of the theoretical framework, just an extensive reference to the primary principles valid for the anastylosis. Respect of the theoretical principles depended solely on scientific experimentation and knowledge. The question that, consequently, emerges concerns the interdependence of theoretical framework and technical implantation and how one may occasionally counterbalance the other. In this anastylosis, the theoretical framework was delineated to produce effective technical solutions and then it seems to have been left aside. Thus, it is reasonable to question why there was not much speculation of the theoretical problems of the intervention and what its impact would have been.

In light of the above, not much emphasis is paid to the *Venice Charter*, apart from mentioning the international conservation charters as the guides that define the principles of architectural restoration. Yet, the primary principles according to which anastylosis was planned and implemented derive from the charter. A difference is noted when the Nymphaeum project is compared to other case studies, where parts of the anastylosis studies analyse the principles followed in the proposed interventions. Therefore, once again, this case is distinguished for placing gravity mainly on technical matters rather than theoretical ones.

Preservation of the monument as a historic testimony, a principle of the *Venice Charter*, was a significant guide in the anastylosis works (see Patricio 1996, 101-104; Patricio and Van Balen 1993, 87-89). The restorers insisted that preservation of the historic values of the monument would be ensured by thoroughly surveying the individual members and the structural supporting system. Accordingly, the technical procedures were those that ensured the following of the theoretical framework. But the historic value of a monument is also a concept understood in a more general sense, such as its history and importance within the archaeological site and does not depend only on architecture and construction.

The general principles guiding the intervention declared that employed materials and techniques should not have adverse effects on the building. Intervention should be the minimum to satisfy structural purposes and to guarantee proper use, conservation, and prolongation of the life of the original fabric. Original material and construction system should be preserved (Ercan *et al.* 1997, 423-424; Patricio *et al.* 2000, 400-408; Van Balen 2000, 213-215; Van Balen *et al.* 1999, 106-109). Indeed, all materials were laboratory tested and experimentation proved their compatibility with the original materials of the structure. Techniques were carefully chosen in order to achieve the best possible results. Preservation of structural unity and care for the structural integrity of the monument were crucial considerations too. Hence, consolidation of architectural elements took place with a view to earthquake resistance, since the monument is found in an earthquake zone. It did not aim at reinforcing the building but rather at controlling the damages caused by earthquakes. The consensus was towards connecting structural blocks, so as to withstand forces without damaging original members.

Most importantly, minimum intervention formed the guide that led the anastylosis approach (Ercan *et al.* 1997, 423; Patricio *et al.* 2000, 400-408). This principle currently forms the starting point of interventions, aiming at mainly preservation of the monument and, secondly, at its educational potential. In most cases, though, it seems to be almost a convention, rather than a strict principle of the undertaken actions, and, thus, often, the intervention easily becomes extensive. In the Nymphaeum, despite emphasis on technical matters, the intervention does not seem to extend to non-necessary completions or additions. However, it should be taken into account that a considerable amount of original material survived in relatively good state, thus its re-assembly with some necessary additions, only for structural reasons, took place to a reasonable extent.

Additionally, theoretical principles guiding the anastylosis were authenticity, reversibility, compatibility, and retreatability. These notions derive from the *Venice Charter* and the contemporary discussions on restoration (see Ercan *et al.* 1997, 423-424; Van Balen 2000, 214-215; Van Balen *et al.* 1999, 108-109).

Concerning authenticity, the attainability of the notion was reflected on preserving the original material and the structural system, relating them to authenticity of design, materials, and substance. Concern over authenticity also regarded the loss of traditional know-how, thus, emphasis was placed on employing traditional craftsmanship. In addition, combination of respect for authenticity and compatibility between new and original material instigated research with a view to composing an appropriate repair mortar (see Degryse 2002, 1457-1458; Viaene *et al.* 1997, 406). The reason for the emphasis on authenticity and compatibility derived from unsuccessful restoration projects and were abided to by employing science. This forms an effective link between restoration and science. However, the definition and attainability of authenticity were not questioned. Technical methods were applied to achieve the best possible results.

Reversibility, which has been constantly encountered in the Greek case studies, was complemented with the notions of retreatability of treated surfaces and the compatibility of treatment materials. Specifically, compatibility entails that treatment materials will not have negative consequences and retreatability means that conservation would not preclude or impede future treatments (see Van Balen 2000, 211-215; Van Balen *et al.* 1999, 109). This principle of retreatability applied to anastylosis should be connected with the discussion on reversibility, as outlined in Chapter 2. The suggested principles enrich the concept of reversibility, by breaking it down into different aspects and regenerating it with introduction of new standards. That is particularly interesting, since it confirms the idea that reversibility is attainable if it acquires specific attributes. Taking into consideration theoretical questions regarding how reversibility is determined, whether it is attainable and whether it forms a valid principle in anastylosis, the technological potential provides the framework for its practical attainment.

These two suggested notions highlight the need for further criteria and standards in anastylosis. The *Venice Charter* is occasionally considered insufficient in guiding architectural restoration, though it still remains valuable. Professionals keep enriching the concept and practice of anastylosis with further principles, as in the Greek examples and the Sagalassos Nymphaeum.

5.3.1.2.3 Issues arising from the project

Although tourism is not projected as a valid reason for this anastylosis, it may have been a decisive factor in its decision and implementation. Indicative of this assumption is the fact that the Turkish Government granted permission for the project, possibly having considered the increase of tourism in the site, as it is located close to the holiday resort Antalya and Sagalassos has now become part of many cultural tours of the coast (see Sagalassos Project 2002). This is again a matter which touches upon sensitive issues that are not discussed openly by professionals. As the funding for the project derived from other sources, and not the Turkish state, thus there was no financial gain, it probably did not affect any decisions on the manner and extent of the anastylosis. The restorers strongly highlight the individual needs of the specific monument having established their method of work. It is the end result, in combination with the urban conservation program undertaken in the whole site, that contributes to the increase of the number of tourists.

Further to that, interpretation and improvement of legibility, together with educational values, became valid reasons for this anastylosis, though not directly mentioned. The only reference made was the need to inform the public (see Patricio and Van Balen 1993), which was considered as a driving force of the works, similarly to most cases in which educational values are prioritised. Due to the lack of a visit to the site, the amount of information that is provided to the public cannot be discussed with certainty.

However, other matters related to public information and education can be commented upon. For instance, the 3D MURALE project, which tests multimedia applications for virtual anastylosis, is acknowledged for enhancing the educational values of the monument and giving a new dimension to the site visit (see Martens *et al.* 2000, 207). Visitors become able to understand what the monument looked like in the past, without professionals having to rely on extensive interventions. The role of education and interpretation can be weakened, as well as their abuse as valid reasons for anastylosis. The advantages and disadvantages of such a situation have not been properly researched and debated yet, as these applications are still under development and there are not many sites and museums that employ multimedia technology to such an extent. What has been so far projected as a significant concern is their function as a methodological tool for archaeological interpretation, since it is acknowledged that a simplified model of the reconstructed building may suffice for educational purposes (Martens *et al.* 2000, 206). Interestingly, although virtual reconstructions facilitate processes of education, interpretation and legibility, they are subject to similar questions and debates, such as alternative interpretations and the degree of differentiation between new and original members. The advantage of such approaches is that they are 'intervention-free'. They do not affect the monument and its original materials, whilst authenticity is not a matter of concern.

Regarding the management of the site, it should be noted that decisions on the preservation and presentation of the monument were made without excavations and further studies having been completed on the site (Sagalassos Division 2004, Waelkens and Vereenooghe 2003), as it has also been observed in Ephesus and Pergamon. These sites are enormous, they have revealed impressive findings and a great history through time, and their monuments have been thoroughly studied. However, the management of an archaeological site, apart from providing for individual monuments, should aim at preserving and presenting the site as a whole. In Sagalassos, an extensive urban conservation program (figs. 214-218) forms part of the annual excavation project, in order to preserve architectural remains and present the site to the public (Sagalassos Project 2002). After anastylosis of the Nymphaeum was completed, studies on the anastylosis and restoration of more monuments have been undertaken. Presentation of the site is further enhanced with a multimedia project that is currently in progress and aims at facilitating research at ancient Sagalassos and at presenting the site and its monuments to the public.

The archaeological excavation and study of Sagalassos began as a British project with active Belgian participation. The Belgian participation became dominant, both financially and practically (see Bracke 1993; Waelkens 1993a; 1993b; Waelkens and team 1997), after being given full-scale permission by the Turkish Ministry of Culture. It forms an excellent example of brilliant collaboration between foreign archaeological schools (Belgian and British) working in another country (Turkey). There are no references of difficulties and complications in the collaboration, neither among the participants nor among the participants and the host country. Many Turkish experts were involved in the project together with local workmen.

In terms of the general management and conservation plan, we can comment upon the reasons for excavating and restoring the Nymphaeum first before other monuments in the site. The main reason was it could clearly be distinguished from the beginning (Waelkens 1993c, 43). This indicates that archaeological and architectural studies and restoration works initiated in a monument that could be identified with certainty. Its state of preservation encouraged implementation of anastylosis since the majority of original material survived *in situ* in good condition. Thus, the reasons for its anastylosis were significantly related to technical matters.

Another significant matter concerns the reasons for choosing anastylosis among a wide range of types of architectural conservation. Starting point was the fact that the Nymphaeum was a dismembered stone structure with most of its elements surviving. The structure could be re-erected and the original elements could recover their original structural behaviour. Anastylosis was chosen with the justification of its international definition.

Further to that, anastylosis was selected as it was considered scientific investigation in the historiography of the building (see Patricio and Van Balen 1993, 87). This investigation comprised architectural and historic information that resulted in understanding the monument and delineating the intervention. This perception of anastylosis has also been encountered in the Library of Celsus in Ephesus. As one of the Library restorers is associated with the Nymphaeum restorers, it is understandable how certain views can have a wider impact. Generally, professionals view anastylosis as part of archaeology, yet nobody has classified it as scientific investigation. In this view, the role of anastylosis in understanding a monument and its features was credited as a learning process.

In this case study too, it is difficult to assess the accuracy of the data regarding the re-assembled members, the amount of new material, and so on. This difficulty has been explained in the monuments previously examined, but more impediments to this evaluation are related to the fact that I did not visit the site and did not examine the Nymphaeum closely.

Regarding the quality of documentation before, during, and after the intervention, a variety of publications provide information on the research undertaken in the monument and the site. A specific publication policy has been developed in order to cover all aspects of the interdisciplinary approach (see Waelkens 2000a, 7-8). However, information about the study, implementation, and final result of the anastylosis of the Nymphaeum is dispersed around many publications. This has been justified by the team in terms of the limitation or the general nature of the completed studies (see Waelkens 2000a, 8). The only specific study is an unpublished MA thesis (Patricio 1992), on the methodology created and applied by the architect in charge. A publication dealing with the final results and the philosophy of the anastylosis (M.Waelkens and J.Poblome (eds.), Sagalassos VI, Acta Archaeologica Lovaniensia Monographiae, Universitaire Pers Leuven) is currently in print.

The collaborating disciplines range from archaeology, architecture, geology, cartography, ancient history, architectural restoration, illustration, geomorphology, conservation, photography to computer technology, and virtual archaeology (Martens *et al.* 2000, 205; Sagalassos Project 2002; Waelkens 1993a, 10; 2000a, 7; Waelkens and Owens 1994, 169; Waelkens *et al.* 1992, 79). Research studies were undertaken within the interdisciplinary approach advocated in the Sagalassos project. Thus, the project, which includes conservation and management of the whole site, rather than of the Nymphaeum anastylosis only, should be praised for the multiplicity of collaborating disciplines. Emphasis is placed on harmonious collaborations for scientifically-based results in understanding, researching, preserving, and presenting a site and its monuments. The team also takes praise in making the whole project interdisciplinary. This approach underlines how professionals worked and with what aims and objectives. All disciplines played a significant role in formulation of ideas and production of conclusive results on the site where the monument exists. The interdisciplinary approach resolved confusions created by different interpretations provided by different disciplines. An example is the study of building stones whose results were differently interpreted by geologists compared to architects and engineers (see Van Balen and Patricio 1995, 65).

Other technical issues refer to studies, experimentation and laboratory analyses undertaken in order to decide upon compatible materials for re-integrations and connections. Experimentation used samples of stones, so as to avoid damaging the surviving ones, indicating respect for the original material. The choices were explained through presentation of laboratory experiments, while financial reasons were openly discussed. Decisions indicate that expensive solutions were avoided as much as possible, though they were adopted, if no other choices existed (e.g. epoxy mortar was decided only for small fragments because it is expensive). Study of the most proper connecting material formed the topic of research of one of the engineers (see Ercan 1995). In this case, some theoretical concerns reinforced the rationale of the financial and technical aspects of the adopted solutions.

Remarkably, there is no reference on the quantity of surviving material. Assurances are given on the enormous amount of original material surviving *in situ* or around the monument, but no concrete information is provided. Lack of information, in terms of figures or locations, is also noted with relation to the amount of new material utilised for completing missing parts. The general consensus confided on assembling as much as possible original material and minimising additions and on the extent of intervention depending on the amount of surviving material. Additionally, although the Nymphaeum had four building phases, there is not much clarification of which phase in its history was represented and for what reasons. However, lack of information on such matters does not provide clear understanding of the intervention on the specific monument.

Natural stone was used as it is not expensive in Turkey, its long-term durability is known, is highly compatible from the aesthetic and structural points of view, and its carving took into account traditional tools and craftsmanship. The final surface carving was integrated into the ancient one to guarantee satisfactory aesthetic results without violating the principle of differentiation among new and original elements.

In addition, the planning of the works presented some problems, such as the safety measures that were taken since was relatively hazardous for both workers and visitors and the seasonal contact with the site (see Patricio 1996, 104-108; Patricio and Van Balen 1993, 89-90). This aspect is rarely referred to in the published sources of anastylosis projects, yet, knowledge of ways to handle problems is important for assisting future projects to take place without major impediments. On the other hand, provisions for maintenance work are underlined (see Patricio 1996, 104-108; Patricio and Van Balen 1993, 89-90). So far, only in the Erechtheion, maintenance and conservation activities are planned for the future. Here, emphasis was placed on the continuous maintenance work and temporary conservation and protection measures in order to care for the monument after its restoration. This also forms a principle of the *Venice Charter* but is rarely followed in practice.

CHAPTER 6: PROFESSIONAL AND VISITOR SURVEYS

The results of the survey undertaken among heritage and anastylosis professionals are presented and discussed in the first part (6.1). The second part (6.2) outlines the results of the visitor survey.

6.1 The professional survey and its results

As presented in Chapter 1, a survey was conducted among professionals in order to identify issues raised from planning and implementing anastylosis, as well as to compare and analyse practices. The survey was planned and conducted with the aim of exploring the views of professionals and in accordance to general survey rules (see De Vaus 2002, Fink 1995, Newman and McNeil 1998). The survey objectives evolved around the identification and exploration of issues regarding the choice, planning and implementation of anastylosis. The instruments selected for gathering data were self-administered questionnaires, interviews, and mail correspondence. The standardised process in designing and administering the survey and its instruments was followed. Inclusion criteria for selecting survey participants were followed, together with the appropriate sampling methods. In this chapter, the collected data is presented and analysed according to the identified major issues of anastylosis and the set research objectives of the survey.

Anastylosis practitioners and heritage professionals were approached. National and regional organisations and services in Greece, Italy, and Turkey responsible for protection and conservation of archaeological monuments, as well as international heritage organisations, were contacted in request of response to the questionnaire or provision, among others, of contact details of professionals and practitioners (Appendix G2). Some professionals positively responded to the survey, some did not wish to take part, while a few found it difficult to respond to specific questions. In meetings with professionals, it was possible to draw conclusions regarding their reluctance to participate or to discuss the matter and clarify their positions.

In total, twenty-three professionals responded to the questionnaire (Appendix G1.1). Among them were nine architects, four architect-restorers, two archaeologists, an architect-architectural conservation consultant, an architect-heritage consultant, an archaeologist-architect, a civil engineer, a heritage consultant, an art historian, a conservator-restorer, and an anthropologist-psychoanalyst. Three of them were from Germany (university, archaeological organisation working in Turkey); one from a Finnish university; two from the UK (university, private practice); four from Italy (archaeological service, university); two from the USA (university, heritage organisation); two from a Belgian university; one from an archaeological service in the Lebanon; one from an Austrian university; three from a Turkish university; one from a restoration service in Malta; one working in private practice in Cyprus; and one with international experience.

Those with whom interviews and discussions took place are fourteen (Appendix G1.2), specifically six architects, five archaeologists, an architect-archaeologist, a civil engineer, and an archaeologist-restoration architect. They were from universities, restoration committees, central restoration services, and archaeological organisations in Greece. One was from a Turkish university. Those who corresponded with the researcher were five (Appendix G1.3): a restoration architect, a conservator, a heritage consultant, an archaeologist, and an archaeologist-historical architect. Two of them work in Greece, one is member of a foreign archaeological organisation working in the Middle East, one works at a Turkish university, and one at a British art institute.

The questionnaire was divided into six sections (Appendix B1). Each section dealt with the multitude of issues related to anastylosis. The questionnaire included relevant issues and extracted as much possible information regarding current practices and trends. Emphasis was placed on acquisition of a variety of opinions with a view to compiling diverse ideas and practices.

In this Chapter, the results from the answered questionnaires are analysed. Answers are classified according to each question, succeeded by their detailed presentation and analysis. Groups of questions are comparatively examined, thus, major aspects are explored and assessed. Comments are surveyed in relation to each question that instigated them, as well as in a wider context. Analysis of the discussions is performed in accordance with the main issues identified in the questionnaire. The aim focuses on providing the general picture of anastylosis and highlighting important issues deriving from its definition and applications.

In presenting the results of the survey, each sub-heading shows from which questions the results derive; the two numbers given in brackets are the number of participants who chose that option and the number of those who answered the question; words or phrases in inverted commas are comments by the participants extracted either from the questionnaire or the general correspondence.

6.1.1 Determination of anastylosis as a concept and as a practice

This section attempts to determine anastylosis as a concept and practice of architectural conservation. Its relation to restoration and reconstruction, the possibility of its existence as an intervention applied to monuments in particular geographical locations, the importance of a more complex and detailed definition of the method than the one provided by the *Venice Charter* of 1964, and its stance in the international conservation vocabulary are explored. This group of questions attempts to clarify what anastylosis means and whether and how it is distinguished from other architectural conservation methods.

6.1.1.1 Anastylosis in relation to restoration and reconstruction

(questions 1, 2)

Anastylosis is considered as either a method of restoration (9/23) or reconstruction (9/23). Those who believe that is the most proper restoration method (2/23) appear less than those who believe that it is the most proper reconstruction method (4/23). Anastylosis is also characterised as 'a restoration technique based on a very specific restoration philosophy'. Additionally, some professionals believe that anastylosis is an amalgamation of restoration and reconstruction (5/23).

A respondent provides another definition of anastylosis, according to which 'if only original pieces are used, it can be considered a restoration, but if new materials are introduced, it is a reconstruction, and that is usually the case'. The question raised from this statement concerns the practical impossibility of re-assembling a monument without inserting, even in small amounts, new material, either as integrations or as connecting material. However, it is discreetly acknowledged that 'under the label of anastylosis, there can be reconstructions that use mostly new material, which certainly is not the intention'.

Factors that differentiate and equate anastylosis, restoration, and reconstruction are explored. Twenty participants conclude that the structure of monuments (7, 9, and 5 respectively[1], out of 20) and the type of original material (7, 5 and 2 respectively, out of 20) play an important role in all three methods. The state of preservation is taken into account in anastylosis (6/20) and restoration (10/20). Availability of original material is a significant matter mostly in anastylosis (14/20) and less in restoration (7/20). Introduction of new material is a major reconstruction feature (13/20), though some is included in anastylosis (5/20) and in restoration (6/20). Surface conservation (11/20) and protection against weathering and pollution (9/20) are significant features of reconstruction.

In anastylosis, restoration and reconstruction, the manner (13, 11 and 7 respectively, out of 20) and variation (7, 9 and 4 respectively, out of 20) of intervention, and the guiding principles (7, 9 and 8 respectively, out of 20) are almost equally significant. On the other hand, as sustained by an archaeologist, 'it is not necessary to distinguish between anastylosis and restoration', their only difference being that 'restoration has the meaning of restoration of the form of the monument'. However, while 'anastylosis has a similar tendency... the material does not permit it'. In case of dispersed members and dismantled monuments, 'you employ anastylosis but you end up restoring because there is nothing in front of you'. It becomes apparent that anastylosis is not clearly defined and the concept lingers between restoration and reconstruction.

6.1.1.2 Definition of anastylosis with relation to the structure and geographical location of the monuments

(questions 2, 3, 14)

Identifying the main factors taken into account when implementing anastylosis, availability of original material (14/20), the structure of the monument (7/20), the

[1] 7, 9, and 5 respectively means 7 for anastylosis, 9 for restoration, and 5 for reconstruction

type of original material (7/20), and the state of preservation (6/20) appear as determinative ones, according to the opinions of twenty professionals. A participant underlines the introduction of new material, identified in the question too (5/20), as a prerequisite to re-assemble fallen members. As stated by an architect, 'anastylosis is often abused by introduction of too much new material'. Generally, anastylosis is considered as a particular type of intervention (13/20), which shows variation (7/20) and has certain principles (7/20).

Emphasis is placed on the structure of monuments on which anastylosis can be applied. It is not apparent in the questionnaire – anastylosis can be applied equally to any kind of monument or monuments with autonomous members (6 and 8 respectively, out of 19) – but it becomes clear through the majority of comments. According to them, anastylosis is mainly compliant with monuments structured by individual architectural members connected with dry joints, if necessary, but without mortar. Monuments that fall on this category are those of classical antiquity.

The overwhelming majority of participants consent that anastylosis can be applied in monuments throughout the world (19/20), though they have to consist of 'autonomous parts', as clarified by an architect practising anastylosis. Since it is implemented to 'a specific type of monuments in which the Mediterranean region is richest in', we encounter monuments subjected to anastylosis mainly in Mediterranean countries. That does not exclude monuments with similar architecture found elsewhere in the world, 'for example in Cambodia'.

6.1.1.3 Architectural conservation vocabulary

As put by a heritage professional, the definition of anastylosis with regard to restoration and reconstruction 'is a semantics game'. An architect-restorer acknowledges the difficulty 'to put some definitions in a limited classification'. An archaeologist affirms that 'these meanings do not have absolute validity', while another participant states that 'such *blanket* definitions are quite meaningless and what is *anastylosis* for one type of structure may be *restoration* for another'.

An archaeologist ascertains that 'in international terminology, the term has the meaning of re-assembly, which is certainly compatible with monuments structured with dry joints'. Notably, in the Greek conservation vocabulary, as affirmed by most Greek professionals, anastylosis is a wider notion, comprising various degrees of intervention. A heritage professional certifies that 'in the *Venice Charter* the definition of anastylosis could be taken as the *official* one...but the international interpretation of the word does not necessarily correspond to the Greek meaning'. That gets even more complicated, as an architect clarifies that in archaeological conservation practice in Greece 'the distinction between αναστήλωσις and αναστύλωσις implies restoration and re-assembly respectively' but we should take into account that 're-assembly is part of restoration'.

Additionally, another architect sustains that 'in the English school, restoration has a pejorative meaning, as unnecessary intervention to the extent of falsification and reconstruction, yet, lately it is not that severely interpreted'. Nevertheless, 'the Italian school, from the 1930s to the 1980s, interpreted restoration as the *umbrella* term of any intervention to cultural heritage'. She describes the line of the Turkish restoration school, according to which 'restoration is not one type of intervention, but it covers all, from consolidation to anastylosis'.

The Austrian restoration school defines anastylosis according to the *Venice Charter*. Introduction of new elements is reduced to 'the minimum necessary for static reasons and for keeping the continuity of the aesthetic form of the monument'. Restoration is defined as the intervention aimed at 're-establishing the aesthetic unity' of the monument, while reconstruction is considered 'the model in 1:1 scale of a lost monument or a part of it'. This indicates a willingness to define interventions undertaken in monuments and ensure clearly defined approaches.

6.1.1.4 The concept of anastylosis

(question 13)

It appears that anastylosis is, and should be, in parallel a matter of abstract discussion of principles, presentation and application of principles, and application of the method (9/22). It is a technical solution, but consists of a theoretical framework too. A small number of participants consider it a matter of presentation and application of principles (6/22) or of technical application (9/22). A participant describes it as 'the last chance to study a monument as a historical source and document in a detailed way'. It is 'a research method, not an application' according to an architect. Emphasis is placed on 'our scientific knowledge of the structure and the way it has been erected'. Others declare the importance to evaluate the structure and assess the significance of the monument. As characteristically advocated by a Greek archaeologist, 'the *why* is the basic argument and *up to what extent* becomes the second argument'. The *why* would determine the decision and it actually entails 'a careful analysis of values' of the monument in question.

6.1.2 Theoretical and philosophical issues raised by the concept and practice of anastylosis, and examination of the role of driving forces

This section enquires after the theoretical framework embracing anastylosis and assesses the driving forces of the practice. Questions include the reasons for anastylosis applications and issues of integrity, authenticity, interpretation, preservation of historic memory, and respect of the values attached to monuments. The role and significance of the driving forces are investigated.

6.1.2.1 Reasons for anastylosis implementation

(question 5)

The main reason for applying anastylosis is the survival of original material (20/22). Other reasons include reinstatement of the form of the monument (14/22), followed by facilitation of architectural studies (14/22) – notably most participants are architects – and aesthetic reasons (12/22). Structural stability of the monument (11/22) is emphasised in the discussions. Retention of the monument as material culture (11/22) plays a significant role too. A restoration architect asserts that the values of the environment and the surroundings and the aim of recovering the vertical dimension within the site are also valid reasons.

From the discussions undertaken with various professionals, survival of original material was projected as the principal anastylosis incentive. Although it forms a primary differentiating factor between anastylosis, restoration and reconstruction, it was not emphasised enough in the specific question. Two archaeologists ascertain the knowledge of the monument, its material, its stability and condition as primary considerations. It is also agreed that 'anastylosis cannot be looked at in isolation…but in the context of other decisions taken'.

6.1.2.2 Driving forces of anastylosis implementation

(questions 6-8)

The main driving forces, identified by twenty respondents, are interpretation (17/20), improvement of legibility (16/20), and education (15/20), together with tourism (13/20) and cultural identity (12/20). However, improvement of legibility (13/20) and interpretation (9/20) are acknowledged as more influential. Interpretation can equally influence decisions, either strongly (9/20) or weakly (8/20), while education (11/20), tourism (10/20), interpretation (8/20), and national (5/20) and cultural (6/20) identity appear not to instigate anastylosis decisions as easily.

These are taken to be the primary forces, and, though unanimously accepted as justifiable, 'their abuse as an excuse' is conceded. It is argued, by an archaeologist, that 'educational values should not be used as an argument' for anastylosis as they can be achieved by other means. This is probably why an architect admits the importance of acquiring 'a balance between improvement of form and achievement of education without distorting the form of the monument'.

The whole discussion on driving forces gave the stimulus to professionals to analyse them further with regard to historic and sociological views. According to a participant, the significance of national identity for archaeological and architectural conservation is identified from the beginning of conservation and throughout its diffusion in European countries in the 19th century, 'the age of formulation of national states'. Reasons for emphasising national identity through anastylosis are found in that 'protection and restoration of monuments directly provide us with an image of the monumental richness of the country and help the establishment and reinforcement of identity...It is a twofold relationship. In Greece, it is identified with projection of classical heritage; in other countries with any heritage considered national'. National and cultural identity, viewed as significant elements of the socio-cultural context, may have different results as driving forces when a native is restoring a monument of his/her ancestral heritage versus restoration by a non-native, as sustained by an archaeologist. He adds: 'for a Greek person the issue of restoring a Hellenistic monument is completely different than it is for a Lebanese person'. It is also acknowledged that the archaeological heritage of a nation 'is bound to be subject to biases' when monuments of different periods co-exist in the same site.

As far as tourism is concerned, it is upheld by an architect that 'tourism influences governments' rather than professionals. Tourism has become a driving force ever since 'the 1960's with the industrial revolution, the end of the war, and the tourism development'. With regard to the creation of jobs and funding availability, opinions are contrasting. Creation of jobs (12/20) seems not to be considered much in such projects. Funding availability does not have a clear role (3 strongly, 6 weakly, 3 not at all, out of 20) as it is regarded 'of a different nature from the other criteria'. Heritage conservation and preservation, systematisation of the environment, and structural stability were assumed as driving forces in anastylosis too.

It is also suggested by a heritage consultant, that 'the reasons behind anastylosis works are seldom explicitly stated, and when they are, they are not real ones'. Another professional indicates that anastylosis is often taken as *political justification* for any type of intervention, which 'gives the form desired by those taking care of the project. Obviously, hypotheses can easily deviate from a historically reliable interpretation'. A conservator emphasises the fact that 'it is all sacrificed for the current agenda, either tourism or someone's vision of the monument', but as far as tourism is concerned 'there is no reliable data. Despite tourists being constantly projected as a reason, they are essentially mute'.

The issue entails that driving forces can be so intertwined that none takes priority and they become equally sound justifications. For example, according to an archaeologist, restoration and anastylosis works in the 1960's in Lebanon were undertaken 'because there was budget available from US Aid. Afterwards, the sites were used as tourist attractions and became focal points in the tourism policy and sometimes in cultural and national identity'.

Around the Mediterranean, sites and monuments in Greece, Italy, Turkey, Libya, Lebanon, Jordan and Egypt, subjected to restoration and anastylosis projects, are influenced by a variety of driving forces. The same is valid for sites and monuments in the East, north-eastern Europe and America, specifically in Germany, Czech

Republic, Iran, Iraq, Angkor, Bolivia, Mexico, USA and Canada. Restoration of monuments in Greece, especially those of the Athenian Acropolis, is influenced by the above-determined driving forces, particularly national and cultural identity. In Turkey various sites are mentioned, such as Ephesus, Pergamon, Sagalassos, Aphrodisias, where education, interpretation, and tourism played a significant role, while funding availability influenced decisions in Sagalassos and Aphrodisias.

When faced with the possibility of an 'ideal' anastylosis project, according to twenty-two professionals, structural stability is undoubtedly the major driving force. According to a heritage consultant, it 'should always be considered'. Interpretation, education, and tourism certainly influence decisions. Cultural identity is preferred, compared to national identity, while funding availability and creation of jobs would affect an 'ideal' anastylosis. Professionals also suggest conservation and better presentation, aesthetics, evocative power of the monument, nature of available material, research, study, and documentation as aspects that should be considered.

6.1.2.3 Respect for values in anastylosis

(questions 9-11)

Professionals underline that, despite driving forces and reasons for anastylosis, everything should 'depend on the values assigned to the structure'. In this framework, the values of monuments are classified according to respect shown to them before and during the intervention. All identified values are taken into consideration in anastylosis projects. According to eighteen participants, the most respected ones are historic (16/18), scientific (16/18) and cultural (15/18), as well as the authenticity of the place (15/18). The significance of the monument for the history of art and its historicity should be taken into consideration, as an architect and an archaeologist clarify. Valid contributions of all periods (13/18), integrity (13/18), material authenticity (13/18), authenticity of workmanship (12/18), original material (12/18), and aesthetic values are prioritised too, together with artistic (11/18) and contextual (11/18) values, as well as design authenticity (11/18) and traditional setting (10/18). Only economic values are not highly esteemed by professionals (1/18). All of them are regarded significant aspects of anastylosis decisions and 'the question is about striking a balance' among them. 'The various aspects need to be judged on the basis of heritage and context', as affirmed by some participants.

Despite the above, it is pointed out that in archaeological sites throughout the world 'we can find examples of anastylosis justified for all reasons or values. But these interventions are justifiable only if in the process they do not destroy other values'.

Authenticity and integrity of monuments are seriously considered, according to twenty-one professionals. Though emphasis is placed on their absolute respect, it is acknowledged that they are compromised: 'Obviously anything you built on a monument will affect it', since 'the integrity of the monument and the authenticity of materials can be destroyed or re-valorised'. It is not clear whether consent is towards a serious (9 integrity and 10 authenticity, out of 21) or partial compromise (10 integrity and 9 authenticity, out of 21).

Nonetheless, 'integrity of the site' is differentiated from 'integrity of the monument', with the former being considered more important. Similarly, authenticity is classified in four categories. Authenticity of the place (15/18) and material authenticity (13/18) form significant aspects, whereas authenticity of workmanship (12/18) and design (11/18) are seen as slightly less important by eighteen respondents. Authenticity of workmanship is related to the use of traditional and ancient tools and techniques.

Remarkably, when questioned about what is of higher priority in anastylosis, most professionals choose authenticity and integrity of the monument (10/22). A heritage consultant insinuates that this happens 'if we are interested in conservation, but not everybody is'. Preservation of historic memory (7/22) and structural stability (5/22) influence decisions too. As another professional states, 'structural stability should not and cannot be an option'. Moreover, although interpretation and education appear as major driving forces, they are not considered a high priority at all.

6.1.2.4 Principles of anastylosis interventions – reversibility

(question 12)

Regarding the notion of reversibility in anastylosis interventions, debates arise on its relativity. It is specified that different kinds of reversibility, such as reversibility 'of structure' and 'of restored blocks', should be viewed separately, especially since they have different degrees of attainability (reversibility of the structure is possible, reversibility of the restored blocks is not). Another professional discusses the relativity of the principle by giving the example of the possibility to correct errors of past interventions. In this sense, reversibility exists, but is not accepted and desired as such. Hence, despite being considered as a concept with relative value, it is generally regarded as attainable (8/21). This is explained by the fact that the architecture of monuments that can be subjected to anastylosis is offered for reversible treatments, since from the ancient times it was possible to dismantle and re-assemble these structures. An architect, among the twenty-one respondents to the question, regards that reversibility can be achieved, if there are 'perfect impressions of surfaces before anything starts and there is no intervention on architectural members'. Another participant confirms that in anastylosis of ancient Greek monuments, 'it is possible to attain reversibility to a great degree, with exhaustive documentation'. Yet, an equal amount of professionals (8/21) are not sure about the issue. A few others (4/21) believe that reversibility is pertinent, since it depends on each case, being a 'subject too complicated to be so linear', while 'no complete observance' exists, particularly in extended interventions. A civil engineer speculates that 'the principle of reversibility is by nature doubtful, since, from the first moment of creation of the monument, its life starts, together with its weathering. Therefore…we have the question about the time life of monuments towards which reversibility itself should take effect'.

6.1.2.5 Influences on anastylosis interventions and practices

Many participants underline the variety of influences on anastylosis practices. These influences derive initially from two identified trends, a conservative and a more radical one, according to an archaeologist and an architect. The former 'requests to leave monuments as found' and the latter 'focuses on social values, in which case the monuments are transformed into Disneylands'. As maintained by a restoration architect, the Italian and Spanish professionals form a school that draws its main ideas from the Italian philosophical systems developed from the 19th century and influencing the Mediterranean countries. In Greece, an archaeologist affirms, recurrent practice of anastylosis in numerous classical monuments has resulted in improved approaches and experience. However, among restored monuments, the diversity of the aesthetic perceptions of the responsible restorers and the hands of different craftsmen are bound to influence the conduct of works. At the same time, in Turkey, foreign archaeological schools are mainly responsible for employed methods and approaches, despite some control exercised by archaeological authorities. In the last twenty years, 'anastylosis of classical architecture has been particularly fashionable, shifting towards reconstruction'.

6.1.3 Technical issues in anastylosis implementation

The technicalities of anastylosis implementation are scrutinised. The possible necessity of determining a percentage of original material that justifies the practice, the initial state of preservation, and the use of eroded or weathered fragments are investigated. The choice of natural or artificial new material, the reasoning for its use, and its differentiation from the original are surveyed. Issues of the use of connecting material, ancient working tools, new or traditional methods and techniques, and of the ancient structural system, are challenged.

6.1.3.1 The role of the state of preservation of the monument and the use of eroded and weathered fragments

(questions 16, 19, 20)

The state of preservation of the monument and its material are considerable aspects of anastylosis. This is affirmed almost unanimously (21/22) by participants, since, if the monument or its material are not preserved in a good state, then 'the structure cannot be understood' and it is 'impossible to re-assemble its degraded parts'.

The use of eroded and weathered fragments has produced debates, as it forms a challenging problem. There is uncertainty on that matter. Some practitioners (7/15) tend to use them, some others (5/15) object to their use, and a small number (3/15) is uncertain. Main reasons for not using them are that they are bound to surplus of intervention (3/15), they destroy the perfections of the lines of the building (1/15), and can falsify the integrity of the monument (1/15). Everything depends on their actual condition and state of erosion, their amount, structural stability, importance as building elements, on the context, and on the condition of other building elements. Besides, the intervention aims and the respect for authenticity should be major considerations before any decision is made. The fact that 'each case must be judged individually' entails that 'general criteria cannot and should not exist'.

6.1.3.2 The surviving amount of original material

(question 15)

Although availability of original material is a decisive factor in anastylosis, it seems that practitioners are divided (10 yes and 10 no, out of 20) with regard to establishing an acceptable percentage of surviving material. They argue that this percentage cannot be certified because it 'would make little sense in trying to re-assemble a structure where little or no material survives', as 'the majority of original material should be present'. Indicative is the answer of an architect who considers such ideas as 'naive'. According to another participant, 'anastylosis can be applied to the extent that the amount of material permits it'. Hence, everything 'depends on each case', so 'no rule can be given'. Specifically, it depends on the state of preservation of the original material, the structural stability of the monument, as well as on the accurate knowledge of its initial form. Some architects clarify that percentages can be assessed according to surface, as 'the upper surfaces of the stones are needed for the anastylosis argumentation, and the surfaces of the building are needed for aesthetic reasons'. They can also be assessed according to volume and weight. An architect maintains that we cannot talk about percentages in anastylosis project but rather 'about levels of anastylosis depending on the quantity and typology of the existing material'. The strongest argument is articulated by a civil engineer who believes that 'anastylosis...is part of a holistic perspective on preserving values'.

However, in an attempt to estimate a justifiable percentage, most suggestions focus on a minimum amount of 70% to 80% of original material and a maximum amount of 20% to 30% of new material (6/10). Few accept a 60% original and 40% new material (2/10). Nobody suggested anything lower than that. Generally, 'use of new material is undertaken in small-scale only if it restores the form of large architectural members. Its extended use, in the sense of creating *copies* of old members in new material, is not recommended'.

6.1.3.3 The use of new material in re-integrations

(questions 21, 22)

Seventeen professionals reveal their opinions regarding the material that should be used in completions and additions. Their majority (12/17) consents that natural stone is the most appropriate choice. Some professionals underline that new material has to be similar and compatible to the original; its choice depends on each case and has to be made accordingly. From a technical point of view, a civil engineer admonishes that 'everything depends on the structural or presentation-related role of additions'.

The principal reasons for choosing natural stone are its material compatibility with the original one (16/18), in relation to the fact that artificial stone can be materially incompatible (11/18). As an archaeologist clarifies, 'extensive use of new materials, especially the products of the chemical industry, in the 1960s and 1970s, caused many damages in monuments'. This is why the use of traditional materials, 'compatible to the physico-chemical features of monuments', is promoted. Aesthetically satisfying results (8/18), philosophical concerns (5/18) and the contribution of the natural stone to reading the structure as a whole (5/18) are significant reasons too. Another incentive is the greater durability of the natural stone (1/18), plus, artificial stone endangers the autonomy of architectural members (4/18). However, natural stone should be used 'with reservations, as new stones will not match the original ones until they have decades of weathering'.

Those who support the use of artificial stone (5/17) argue that it can be produced and worked on easily and speedily (7/18), while it eases the differentiation between old and new material (6/18). Some architects question this argument about easy and fast production and workability. Furthermore, artificial stone provides optimal adhesion to the original one (3/18) and its compatibility with the historic fabric can be tested (3/18). Other reasons include comparative cost benefits (3/18), possibly in relation to the fact that 'natural stone is often economically unfeasible'. However, opinions are contrasting, since, according to another participant, artificial stone can be more expensive. Philosophical concerns (2/18), lack of trained stonemasons (1/18), and the fact that some examples of its use, as in the Priene theatres, have proved excellent, contribute to its choice too. 'Enormous technical advances' in its production guarantee its efficient use. An architect warns that artificial stone 'should be weaker than the original in the interest of conservation'.

Some professionals argue that this matter 'depends on each case'. Both options can be good and their 'choice depends on the type of original stone, on weathering conditions (snow, pollution, etc.), and the budget and philosophy of the project.

Those who tend to use natural stone may occasionally use artificial 'in non visible parts, such as the interior of walls'. In many cases, natural stone can derive from the same quarry the original material was extracted (as in the Acropolis of Athens and other sites).

6.1.3.4 Differentiation of new and original material

(questions 17, 18)

New material, used together with the original, should be harmonious with the whole but differentiable upon close inspection (18/21). This is a principle enforced by the *Venice Charter* (Article 12) and professionals are in agreement with this requirement. Only two, from twenty-one respondents, believe that it should simply be visually harmonious, while an architect maintains that 'physical and chemical compatibility is more important than visual harmony'.

For achieving differentiation, numerous methods are employed, either individually or in combination. Most common ones appear to be the different texture (12/19), abstraction of details (8/19), and different composition material (7/19). New members may also bear a contemporary stamp or identifying mark (7/19) or be distinguished with the aid of modern technology and multimedia (7/19), though the latter will widely be achieved 'eventually'. Other methods are also used, maybe not to great extent: different colour (5/19) or explanatory labels (4/19). Professionals highlight the relativity of choices, indicating that they depend on the monument and the original structure.

6.1.3.5 The ancient supporting system and the connection of new and original architectural elements

(questions 23-25)

The ancient supporting system is almost unanimously (16/19) followed, if possible, since 'the structural scheme bears heritage values and is also part of the monument'. Past experiences – especially in cases of 'integrating stronger constructions' – have proved that, if it is not followed, problems will arise in the future and the monument will be endangered. It was also underlined that if the ancient static system is not followed, then the intervention is reconstruction and not anastylosis, which 'intends to reinstate the form and structural behaviour' of the monument. Suggestions focus on detailing and evaluating each case 'to bring the solution'.

Emphasis on the *possibility* of following the ancient supporting system indicates that, while in theory it is attainable, in practice it may be difficult to achieve. An archaeologist commenting on the role of civil engineers, who decide on issues of structural stability, objects to the use of an earthquake possibility as a point of reference, as 'it entails alteration of the initial structural form'. He draws attention to the ancient creators who used limited connecting joints and how capable of withstanding these forces the monuments were made. Only after people intervened in the monuments, their static stability was decreased.

For connecting new and original elements, material similar to original joining material or nothing, if nothing was used originally, appears to be the best option (11/19). New joints with laboratory tested materials are also used (7/19). Recently, discussions about employing the same materials used in antiquity (steel embedded with lead) have initiated with regard to the Parthenon anastylosis, as confirmed by a Greek archaeologist. Participants emphasise the importance of considering factors, such as scale, type of connection, and efficiency, before any decision. Laboratory-tested materials are accepted, given their efficiency. They should only be employed 'for joining broken parts of one element, not two independent elements'.

Titanium rods and pins (15/19) are widespread, followed by epoxy glues (14/19) and fibreglass rods and pins (13/19). Steel rods and pins (7/19) and cement (5/19) are still used, despite problems presented in the past. It was also affirmed that combinations of steel and concrete created corrosion problems, due to oxidisation of steel which caused swelling of the cement. Cement is generally incompatible with stone. As pointed out by an architect, cement mortars used in recent examples, such as the Acropolis monuments, have a specific composition, without salts and with a special kind of sand, in order to avoid future damages. Other laboratory-tested materials are stainless steel; cement mortar, which can be easiest, safest, and occasionally reversible; carbonate rods; bronze; wood; epoxy mortars; hydraulic lime; fibreglass mats. Their choice should depend on the '*role* of the added material', 'the original material', 'the load on the structure', and 'the problems and needs of the structure'.

They should be carefully selected and tested and able to be replaced if needed. They should also be used in a way that they 'break before the original stone'.

6.1.3.6 Use of traditional or new methods and techniques and of ancient or modern working tools

(questions 26-29)

This issue is interrelated with achieving authenticity in workmanship, a principle well-respected. Nevertheless, it is argued that in anastylosis of ancient monuments, 'we are not trying to preserve techniques but a structure; we do not deal with traditional settlements'. So, if the intervention is to learn about working techniques, 'then the work should be designed accordingly'.

In this framework, the results indicate no preference on either traditional or modern tools. Most professionals believe that it might not necessarily be 'a matter of principle but a matter where the decision depends' on various factors, among them 'the purpose of intervention' and 'the desirable result'. Ancient working tools are preferred, at least 'in principle', because they achieve authenticity in workmanship (6/18) and assure best results (6/18). They are also accurate (1/18) and contribute in studying the ancient techniques (1/18).

Other anastylosis practitioners are slightly sceptical about modern tools, but most of them judge them as efficient, as they 'can be as good as ancient ones'. In anastylosis 'no imitation' is needed. Modern tools are chosen principally for their accuracy (9/18) and the fact that training in the old craft of working the stone is not needed (5/18). Another argument is centred on the fact that modern tools are sometimes better (1/18) and more economic (2/18) than ancient ones.

Despite these, most participants maintain that their choice depends on particular circumstances, and, as a heritage professional remarks: 'often...in the eastern Mediterranean, modern masons still use traditional tools'.

New and traditional methods and techniques are both employed (18/21), in accordance to 'the specific needs of each case'. Twenty-one participants consider them both to achieve impressive results in terms of homogeneity, compatibility, minimum intervention, and reversibility. Traditional methods and techniques are preferred for the same reasons as traditional tools – achievement of authenticity of workmanship (9/18) and better results (6/18). They are considered to constitute a professional approach (5/18), which follows the requisitions of the latest restoration theories (3/18). Other reasons are their giving of information on original solutions (1/18), resulting in authentic-looking textures (1/18), and ensuring better integration of new material (1/18).

Conversely, new methods and techniques have the advantages of easy (7/19) and fast (4/19) use, while being cost-effective (6/19). Further reasons projected are their giving understanding of values (1/19) and their guaranteeing of safety (1/19), better preservation of the original structure (1/19), better results (1/19), better stability to the monument (1/19), and possible compatibility (1/19) too. Interestingly, they reflect the contemporary intervention (2/19), because, by leaving modern tooling marks on hidden surfaces, the recent intervention can be distinguished in the future.

6.1.4 Anastylosis and the International Conservation Charters

This section focuses on examination of charters that set the theoretical framework and the principles overseeing interventions. A series of charters in relation to anastylosis were presented among the choices. Interpretation of their principles or delineation of extra principles indicate the lucidity, or not, and significance of these documents. Possible problems encountered during the interventions are explored.

6.1.4.1 Which charter provides best for anastylosis implementation; which was followed

(questions 30, 31)

According to the opinions heard, the charter that provides best for anastylosis implementation is the *Venice Charter* of 1964 (12/18). Other charters are preferred too, sometimes in combination with the above-mentioned one. These are the *Burra Charter* of 1999 (5/18), the *Athens Charter* of 1931 (4/18), the *ICOMOS Charter for Protection and Management of Archaeological Heritage* of 1990 (3/18), the *Nara Document on Authenticity* of 1994 (3/18). Some Italian participants mention the *Restoration Charter of Rome* of 1972 (1/18) and the *Italian Charter of Restoration* of 1931 (3/18), with the oldest version being the prevailing one. All charters are considered 'generalising rules', which, 'if followed blindly, can lead to awful results'. They cannot provide for each monument individually, because 'each monument is unique and presents specific problems and needs' and 'should be approached as a unique instance, with common sense and integrity'. In addition, it is suggested that, since 'each charter gives some of the aspects' of restoration, what is needed is 'to put all of them together in a new one'.

In the various anastylosis projects undertaken by the participants, the *Venice Charter* (13/13) was unanimously followed. Few of them preferred the *Charter of Rome* (4/13) and the *ICOMOS Charter for Protection and Management of Archaeological Heritage* (4/13). Others followed the *Italian Charter of Restoration* (3/13), the *Nara Document of Authenticity* (3/13) and the *Athens Charter* (2/13). It should be noted that some charters were used in combination and that some professionals chose different charters for different projects. An architect characteristically states that he did not use any of them. Furthermore, according to a heritage professional, 'charters are seldom used as a guideline. Often they are used as an excuse!'. The *Venice Charter* was employed with free interpretation of principles (10/13) or together with delineation of extra principles (3/13). All other charters were either subjected to free interpretation of principles so that the best possible results would be obtained (the *Charter of Rome*, the *ICOMOS Charter for Protection and Management of Archaeological Heritage*, and the *Nara Document on Authenticity*) or accompanied by extra principles emerging from the specific needs of monuments (*Italian Charter for Restoration*, *Charter of Rome*, *Declaration of Amsterdam*).

6.1.4.2 Assessment of the charters: sufficiency in guidance; advantages and disadvantages; problems encountered; need for redefinition of anastylosis in them

(questions 32-35, 4)

The employed charters were assessed with regard to their sufficiency in planning and executing anastylosis. Professionals express contradictory views; some believe that they are sufficient without presenting any major problems (5/18) and others that they can improve (5/18). Remarkably, only one participant sustains their absolute efficiency. Most of them (6/18) are perplexed, and this became 'the reason that extra principles were established'. It is indicated that planning and executing anastylosis 'is not something you would learn from a charter' and that 'charters were not really intended to be guides' but rather 'lines of principles'. A participant interestingly suggests that charters 'could not possibly' provide guidance in interventions.

The main advantages of the charters employed as guides in anastylosis appear to be exactly the provision of a theoretical framework (13/18) and their quite old but still valid principles (7/18). Yet, provision of adequate guidance (4/18) and flexibility of interpretation (2/18) are considered indications of their prevalence. Moreover, these charters 'contribute to respect towards the monument'. It is affirmed that the charters 'are good as general frameworks', but it should be kept in mind that 'every kind of monument is different'. Their projected disadvantages consist of their generality (12/18), focus on theoretical approaches (5/18), and lack of clarity (4/18). Participants highlight their inadequacy, non-necessity, occasional difficulty in applying them, and limitations when try to follow their principles one by one, as well as the need to update them.

An architect sustains that the *Venice Charter* fails 'to appreciate the different values a historic building may possess' and another affirms that 'it is vague even in its reference to anastylosis', whereas it focuses only 'on stone architecture'. Further opinions were expressed during interviews and discussions with professionals. What derives from all these, is the view that the *Venice Charter* 'is good and useful as a general framework, but needs specifications' or 'a kind of reform in the future'.

An interesting comment comes from an architect who advocates that 'it is fine to provide a theoretical framework, not guidance'. This is also declared by another architect who sustains that the charters are general but useful, because 'they regurgitate the older restoration principles with regard to requests for aesthetics and historicity' and because of 'the uniqueness of monuments'. Hence, they should remain 'our general theoretical framework', because 'every case of restoration is totally unique'. According to a civil engineer, the best practice would be 'the minimum possible violation of rules for the best possible results on the monument', something that entails 'discreet interventions'.

In almost all cases (11/15), respondents confirm that problems were encountered in anastylosis implementation according to the particular conservation charters. Some state that the problems were many (4/15), others that they were minor (3/15) and some that problems emerged only occasionally (4/15). Only a few (4/15) of them declare absolute smoothness of interventions.

The main problems encountered are related to the variation of interpretation of principles by the professionals involved (13/16), almost equally characterised as major (6/16) and minor ones (7/16). Decisions imposed by financial issues (8/16) and difficulties in co-operation of multiple disciplines (7/16) appear to some extent. Bureaucratic issues (5/16) are quoted too. Other considerable impediments to the completion of projects are aesthetic problems, the uniqueness of each case, the non-coverage of the needs of the site by the charters, the rare technical preparation of operations, and the practical application itself. The need to define the objectives of the projects and the way in which the working methods contributed to getting results and preserving values indicate that 'there is no *unique* way to intervene'.

The need for redefining anastylosis in the *Venice Charter* was questioned. Despite the fact that some professionals (6/23) do not deem it important, the majority of them (10/23) agree with the inclusion of a more complex and thorough, yet *flexible* definition, mainly with regard to the type of material, the connection of architectural elements and the objectives of the practice. Concurrently, there are responses (7/23) arguing the dispensability and triviality of something like that, because 'the question is less of a definition and more of an understanding' of the method and 'the way it is practised'. As a heritage professional states, 'anastylosis is a restoration method, which has been clearly, though briefly, defined in the *Venice Charter*. This could be taken as the *official* definition, and there does not seem to be any reason to deviate from it'. Additionally, two anastylosis practitioners sustain that the definitions of the *Burra Charter* are confusing and ambiguous.

6.1.5 Management aspects and procedures for anastylosis decisions and implementation

The procedure for approval of anastylosis decisions and its assessment are investigated, whilst the co-operation of which disciplines is determined.

6.1.5.1 Identification and assessment of approval procedures

(questions 36, 37)

The most common procedures for approving anastylosis proposals appear to be the establishment of a specific directorate (17/19) at regional (5/17), national (8/17) and international (4/17) levels. Decision-making multi-disciplinary boards (9/19) at all levels (regional 3/9, national 2/9, international 4/9) are also employed. Multi-step processes (6/19) are common at all levels (regional 2/6, national 2/6, international 2/6). It should be kept in mind, though, that procedures differ from country to country. Each country has a different system, and, normally, 'decisions are prepared locally and sometimes confirmed by state authorities at national or central levels', but rarely internationally. Even within a country they might differentiate 'given the importance of the building and the site'.

These procedures are acknowledged as efficient to some extent (9/18), yet, a professional deems them as rather slow. Some participants (4/18) perceive them as not efficient. Nobody presumes their competence, while few participants (4/18) choose not to comment, indicating a possible unsatisfactory assessment.

6.1.5.2 Co-operation of disciplines

(question 38)

Regarding the disciplines co-operating in the framework of multi-disciplinary approaches, archaeology (19/22), architecture (19/22) and conservation (19/22) are the most significant ones. Structural (14/22) and civil engineering (7/22), together with site (14/22) and heritage (7/22) management contribute in most cases. Geology (7/22), policy and planning (5/22), and information systems (4/22) are not employed that often. Besides, an emerging field is public relations for sponsoring the works. It is probably employed in cases where funding cannot be provided by the state itself or the relevant authority. In the past, one or two disciplines co-operated, archaeologists or architects or even civil engineers, for instance in the restorations of the Acropolis monuments in Athens or of monuments in the Lebanon.

Some professionals believe that the multidisciplinary committees should be careful in their role, as archaeology is a humanistic discipline and, thus, it should respect the values of the monuments. Hence, anastylosis is projected as an extension of archaeology. Furthermore, the role of civil engineering in anastylosis is clarified by a professional who indicates that its 'aim is the reduction of apertures with consideration of increased resistance and construction quality, so that a concrete stone member will be created'. Balance is achieved between the 'respect towards the monument and the rules of technique and structure'.

6.1.6 The way forward

This section attempts to determine whether the establishment of a methodological approach or an amendment to an existing charter is needed and, if so, what it should comprise. Should it focus on theoretical, philosophical, or technical issues?

6.1.6.1 What professionals believe regarding a more efficient anastylosis practice

(questions 39-41)

Architectural conservation professionals appear almost divided between those who wish (8/18) for a new charter or an amendment to the existing charters, regarding anastylosis, and those who disagree with that (8/18). An architect, utterly disagreeing with that prospect, enhances his objections by underlining that the whole issue 'is a matter of principles and is related to case studies and common knowledge'. Only two of those surveyed appear slightly sceptical about it, whereas an architect believes that it 'is probably too late'.

Those who wish for a new charter or an amendment, suggest that it should comprise a methodological approach to monuments (7/10), a delineation of anastylosis limits (6/10), and determination of principles (5/10). Two participants emphasise the need for 'a definition of the term *anastylosis* in the modern world of archaeological conservation', which could consider 'possibilities in virtual media'.

In distinguishing among theoretical, philosophical, and technical aspects, the ranking of importance places priority on philosophical issues (5x1[2], out of 11). Theoretical (4x2 and 2x1, out of 11) and technical issues (4x3 and 4x2, out of 11) follow.

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[2] (5x1, out of 11) it means that out of 11 respondents, five ranked the specific topic as number 1.

6.1.6.2 Alternative suggestions

(questions 42, 43)

Those who wish for specific solutions, according to their experiences and observations, present excellent suggestions.

Regarding procedures of proposal and implementation of anastylosis, multidisciplinary boards, at national and international levels, are strongly recommended. International committees, involved in organising meetings of anastylosis professionals with the aim of exchange of experience, are projected as an efficient tool. Involvement of all relevant bodies in anastylosis decisions is considered a holistic approach, which can result in thorough and informed actions. Another suggestion concerns the simplification of bureaucratic procedures which cause delay of action for various reasons, either due to romantic views of restoration or due to 'supposedly' better control. By introducing simple, clear, and quick procedures in terms of a unified system of control of studies and works, anastylosis works will be implemented efficiently, without delays at the expense of monuments.

Guidelines can have the same, if not more competent, effect as a new charter or an amendment. An architect calls for national recommendations. No matter in what level they are introduced, the idea is to have the form of either a set of principles with flexibility of interpretation or technical and scientific instructions or appendices – since the theoretical approaches are still valid – or application manuals and case studies based on charters. In case of technical recommendations, they should include detailed guidelines for deciding anastylosis on the basis of a certain amount of surviving material. These should emphasise not the kind of material to be used, but the fact that the materials used for integration should be compatible and laboratory-tested. A professional suggests inclusion of anastylosis limits and what practitioners should not do, as well as a monograph on intervention ethics.

Attention should be paid τo the participation of archaeologists and their education in relation to conservation (conservation courses in the archaeological curriculum) to warrant co-operation and understanding among disciplines. In addition, those responsible for anastylosis should be educated and be informed about aesthetics.

Professionals agree that publications can be effective and guide our interventions to archaeological monuments. For each case they should clarify the arguments and methods and evaluate the contribution to heritage preservation. They can analyse – both from philosophical and technical viewpoints – anastylosis work that has been undertaken, while discuss and debate theoretical aspects. Further publications of concluded works and evaluation of results, in terms of unfortunate examples and exceptional works, could highlight problematic aspects of anastylosis to interested professionals. Besides, thorough analysis of proposed interventions can be carried out by publishing the anastylosis studies before the works take place.

Other suggestions include the placing of emphasis on virtual anastylosis. This is suggested by more than one professional and indicates the abilities of modern technology. In that way, interventions will become flexible and easily disseminated.

Passionate views focus on new approaches to conservation in general. These approaches should be 'value-based' and 'principle-based' or 'rules-based'. That entails 'assessment of the monument and its values: what are the values attributed to the creators of certain monuments and what are the values held by those who have inherited the monuments'. If these values contradict each other, 'what should be done is to reduce the cost of contradiction and assess which value should be projected'. There are ways so that 'the consequences of ignoring values are minimal and the monument does not become an enemy of society'.

6.1.6.3 Further comments

With relation to the unsuccessful attempts to contact restoration organisations and services, either national or international, a few remarks can be made, according to my personal interpretation. The result could indicate lack of organisation, as no answer was ever received. Refusal to answer the questionnaire could be attributed to a certain indifference to research that may not have direct results or be generally favoured. This insinuates the need for transparent operations and procedures and the creation of archives open to anyone interested, for well-informed research.

As far as individuals are concerned, their refusal to participate in the survey can denote, apart from lack of time or busy periods, a certain disagreement with the research topic or doubt of its necessity or the importance of its results. That was occasionally admitted by those who reluctantly participated. In those cases, disagreement was based on the fact that there cannot be anything more specific to anastylosis rather than the *Venice Charter*. According to these opinions, the theoretical framework provided by the charter is sufficient for practitioners. What is important is the experience gained by professionals working on monuments. This experience becomes common knowledge in each country, especially when the responsible groups of people implementing anastylosis publish their results regularly or undertake more than one project.

Regarding those who agreed to participate but did not manage to answer, the reasons were analytically explained and in most cases they were similar. Among those reasons was the feeling that the questionnaire was only addressed to anastylosis practitioners. That is partly correct, since a great part of the questionnaire examines technical issues of anastylosis implementation, so to complete the relevant sections, respondents would have to have practised anastylosis. On the other hand, the questionnaire was designed so as to simply give the stimulus to discuss further the raised issues. The other reason appearing frequently was the fact that, as put by a professional, 'the issues you are trying to grapple with are not amenable to such questions'. According to the explanations, anastylosis depends on a variety of factors, either related to the monument, its structural needs, and its state of preservation or to the values attributed to it or the context in which decisions are made. Suggestions focused on approaching specific examples to explore the raised issues in depth. The latter was achieved with the case studies. Occasionally, the decision not to respond may have been related to political sensitivities, given the context on which those professionals operate or have operated. Finally, for some professionals questions were either too personal or too theoretical.

6.2 The visitor survey and its results

6.2.1 Introduction

A questionnaire was developed, in the framework of a so-called *visitor survey*, in order to explore the views and opinions of the public visiting monuments subjected to anastylosis. It was undertaken in a small scale in order to give the bigger picture of the public opinion and underline the importance of such surveys in heritage conservation. Its objective was to address the understanding of conservation and anastylosis by the public, the issue of driving forces, in terms of their acknowledgement and approval, as well as the public's eagerness to get involved in such projects and be provided with information on the undertaken works.

The survey took place within three different archaeological sites: the Athenian Acropolis, the Acropolis of Lindos at Rhodes – both in Greece – and the site of Ephesus in Turkey, whose monuments also formed my case studies. Questionnaires were completed near the archaeological site or outside the area. Visitors were provided with information about the reasons of the survey, and questioned about their willingness to participate in it.

The answers to the questionnaire are analysed individually and in groups identifying the main issues. The analysis offers an insight into the view of the public, and can enlighten professionals about the need of addressing the public in anastylosis activities.

6.2.2 Demographic elements

(questions 15-18)

In total, 85 people visiting archaeological sites in Greece and Turkey were questioned. Most of the people who were surveyed live in Greece (59/85), while a few (22/85) in the UK. The rest (4/85) come from the USA, Ireland, and Belgium. More than half (51/85) are women, while men are less (34/85). It was attempted to cover as much the age range as possible. However, almost half of them (40/85) are in the age range of 25-34 and over a quarter (23/85) between 19 and 24. The rest (22/85) of them were over 34. Some participants had completed their full-time education at the age of the 18 (17/85), some after first degree or diploma (33/85), some after a postgraduate degree (23/85), while the remainder (12/85) were still at full-time education. Generally, the answers come from a wide range of people; this is not enough to qualify for a proper visitor sample, but it strives for a relative representation.

The reason for referring to the demographic data is that, in attempting to establish who the survey was aimed at, the decision was to include an equal number of national, including local, and international visitors. Despite not attempting to conduct a professional visitor survey, it was felt that it should include as representative a sample as possible. Obviously, participants did not equally represent national and international visitors. Their answers highlight the fact that there is not great divergence regarding the opinions of the public, especially with regard to issues of national/cultural identity and tourism.

6.2.3 Understanding anastylosis

(questions 1-3, 9, 13)

For the public, it seems that anastylosis is either repair (42/85) or reconstruction (43/85). Visitors appear divided regarding how they perceive anastylosis and whether it involves repair of structures or simply their rebuilding. Hence, two opposing notions are attributed to the same method. That may signify that anastylosis is considered to cover a wide variety of interventions or that varying extents of anastylosis differentiate it as repair or rebuilding.

Most of those questioned (61/85) had visited other monuments subjected to anastylosis. When asked to name these places, they mentioned examples from Greece and the Mediterranean. Not all mentioned monuments have been subjected to anastylosis; some are indicative reconstructions and restorations. According to them, the most important monuments, in which anastylosis has been implemented, in Greece are: the Treasury of Athenians at Delphi, the monuments of the Acropolis of Athens, the Hellenistic Stoa at Lindos, the temple of Hera at Samos, the temple of Apollo at Bassai in the Peloponnese, the theatre of Thasos, the monuments in ancient Olympia. In Turkey, the most popular ones are the monuments of Ephesus, while in Italy, the temples of Selinunte. Famous restoration examples presented as anastylosis are those undertaken in the Arch of Galerius and the monuments of the Agora in

Thessaloniki, the Acrotiri at Thira in Santorini, and the Rotonda in Thessaloniki. The Arch of Titus and various monuments in Rome and in Pompei are recorded as subjected to anastylosis too. The Stoa of Attalos in the Athenian Agora and the Palace of Knossos in Crete, two famous reconstruction examples, are mentioned.

When faced with the question of what a successful anastylosis would involve, the public is divided between conservation of architectural members (45/85) and preservation of the monument as found (28/85). Use of original material (39/85) and stabilisation of the structure (37/85) are among the prerequisites for a successful anastylosis. Making the monument look as it was originally (40/85) and completing missing parts with new material (24/85) are also considered important features.

The above-mentioned confirm the fact that, for the public, anastylosis is an intervention, no matter what its form is. Nobody seems to distinguish among restoration, reconstruction and anastylosis. The extent of intervention determines successful results. The fact that there is no observed tendency of what is considered successful, or not, is more related to aesthetic preferences rather than to understanding of intervention methods.

Regarding the visitors' evaluation of the result of a restoration, it seems that most of them (38/85) are not convinced that a restored monument seems normal or fake. Some find it normal (33/85) and some (15/85) believe that the monument looks fake. A certain tendency of how the final result is judged can be distinguished. It was expected that the public would be equally divided in their opinions. Yet, no matter what degree of intervention is preferred, the affirmative conclusion is that there is always the danger of making the monument look fake and not as a testimony of its former glory. That indicates that professionals need to be more conscious of their approaches to monuments and how these are finally presented to the public.

6.2.4 Anastylosis, driving forces, and the public

(questions 4-8, 11, 14)

The majority of respondents (73/85) indicated that they would feel pleased and proud if a monument near their home was restored. That could explain the emphasis placed on national and cultural identity by those who undertake anastylosis and restoration.

It is indicative of the tendencies of the public to support restoration work that elevates monuments in their areas. In this sense, anastylosis, and all other forms of restoration, attracts their interest by reinforcing their identities.

Most visitors (59/85) seem to believe in an individual's knowledge of archaeology and architecture to understand a ruined monument. Hence, a great number of people may not be able to familiarise themselves with monuments left un-restored. Thus, restoration and anastylosis facilitate understanding of monuments.

Additionally, the public answers that interpretation deriving from a restored monument could educate them about historic values (61/85), architecture (58/85) and archaeology (51/85). Every person questioned feels that it is important to preserve the historic record and stories about the monument, which entails that its historicity is the most significant aspect in restoration. However, aesthetic (29/85) and artistic (21/85) values are not considered that important. The answers relate education with improvement of legibility and interpretation, rather than spiritual pleasure from enhancing the aesthetic and artistic qualities of the archaeological heritage.

The majority of participants (78/85) believe that anastylosis and archaeological site conservation attracts more tourists to a site, and, interestingly, they (72/85) would be happy in such cases. Only a small number (8/85) disagrees with such a choice. This is remarkable, since it indicates scepticism and awareness regarding the occasional catastrophic influence of tourism in monument preservation.

When the public was faced with the choice of driving forces to hypothetically guide them in anastylosis decisions, reinforcement of national and cultural identity (41/85), together with education about archaeology (41/85) appear as favourable options. Enhancement of the values of the monument (25/85) was considered a valid reason. Tourism (14/85) and creation of jobs (8/85) do not seem respected considerations.

The priority given to the national and cultural identity of the people and the advancement of their archaeological education in relation to anastylosis is explained by the fact that those questioned agree that a restored monument would make them feel pleased and proud. Possibilities of education would be among their primary options if they would hypothetically undertake restoration projects. Artistic and aesthetic values of monuments would not be principal aims if the visiting public were responsible for anastylosis works. Professionals who project these values when planning anastylosis should keep that in mind. In addition, even though most visitors are happy with the increase of tourist numbers in restored monuments, they would not use it as an argument in anastylosis nor allow it to influence their decisions.

In general, the public seems consistent in what they wish in anastylosis and its effects and they would aim towards different values and objectives compared to the professionals. This creates the need for further research on exploring the public opinions on our approaches to archaeological and architectural heritage.

6.2.5 Preferences

(questions 10, 12)

When presented with the question about the best choice in architectural conservation, the visiting public seems to linger between a monument subjected to anastylosis (36/85) and a monument presented as found (28/85). Reconstruction (13/85) or presentation of the monument in small replicas or with the aid of modern technology (13/85) also form options of some visitors.

Even though the public appears somewhat confused in what they believe anastylosis and restoration are and what they consider as a successful anastylosis, they are certain in what they wish for a monument. No major interventions or technological aids are favoured, though some kind of intervention becomes their best choice. They are slightly contradictory in what they expect and understand, indicating that it probably depends on each case.

When faced with the choice of being consulted about why they value a monument, before any conservation decision, the public responds positively (63/85). That is probably attributed to their willingness to participate in the conservation decision-making and an interest in contributing by having their opinions heard. It was quite clear that the majority wants to be part of such projects, although their involvement was not specified. The public is a great driving force in anastylosis, and is the one least actively considered. Professionals declare that everything is done for the monuments and the public, but the public does not seem to have an opinion, and apparently they would be pleased to have one. However, the benefits of such an involvement would be enormous. Visitors are advocates of conservation and their contribution can be more than valuable for the monuments and their survival in time.

CHAPTER 7: DISCUSSION OF THE ISSUES RAISED FROM THE CONCEPT AND PRACTICE OF ANASTYLOSIS

Issues raised by anastylosis as a concept and practice, identified by the literature review and explored through the case studies and the professional and visitor surveys are comparatively examined in accordance to the fulfilment of the specific objectives of the thesis (as specified in Chapter 1).

7.1 What is the historical background of anastylosis?

The historical overview of anastylosis is presented in Chapter 3. Accordingly, anastylosis first appeared as a concept related to Christian art in the 1st century AD. In the 20th century the term was re-introduced in *The Athens Charter* (1931). Since then, anastylosis has taken its place within the international architectural conservation vocabulary and restoration practices.

Throughout the 20th century, anastylosis was implemented as a form of architectural conservation in the Mediterranean region. Among the Greek examples (Athenian Acropolis and Acropolis of Lindos in Rhodes) anastylosis projects were carried out. At that time, variable perceptions of national identity guided the projects. A series of theoretical and technical matters emerge from examining these case studies.

Specifically, materials, such as concrete and mortar, which caused deterioration of monuments, were employed in past projects. Members were displaced, distorted by chiselling and damaged by insertion of metal, which corroded. Surviving elements were re-assembled in an unsystematic manner falsifying the form of the monument, while the structural system was altered. Thus, urgent measures are required to avert the consequences of past interventions. The monuments are dismantled, their deteriorated members conserved and then re-assembled in their original locations, if they can be established.

The employed materials were products of the latest technological advances and were endorsed by the then theoretical framework, yet, they proved damaging for the structures. Thus, questions on the employed technology should be raised, while experimentation needs to be exercised before implementing anastylosis. Fortunately, due to the technological advances themselves, the durability and future behaviour of new materials can now be tested.

A limited amount of disciplines – mainly archaeology and architecture, and occasionally civil engineering – co-operated during the past projects. Now, the field of anastylosis is enriched with the collaboration of a wide range of disciplines (from archaeology to computer technology and heritage management).

Another issue in the comparison between past and current practices refers to the recording and documentation of the monument, before and after anastylosis, and of the process itself. This may causes serious problems, as in the case of the minimal and largely incorrect documentation faced by the current restorers of the Lindos Stoa.

Despite problematic matters, it is rightly acknowledged by professionals that the past projects contributed in preserving monuments in a state which they would not possibly have now if they were left un-restored. Additionally, constant practice of the method resulted in acquisition of valuable experiences and in improved approaches.

Regarding the most recent anastylosis projects, only a few differences are noted between the approaches of the 1970's, when anastylosis was officially endorsed internationally, and the current ones. Primarily, the disciplines involved have gradually become varied. This is expected, as the *Venice Charter* (1964) endorsed collaboration of diverse fields of expertise while a certain progress in multidisciplinary approaches is confirmed in practice.

Accordingly, differences and similarities between past and recent anastylosis interventions are a result of advances in heritage management and restoration theories, and the development of modern technology. The significance of the monument remains the determinative factor for the time, effort, and financial resources allocated for its anastylosis.

7.2 What does the concept and practice of anastylosis currently entail?

Anastylosis is an intervention strategy, decided and implemented as part of site management. Numerous issues related to the anastylosis of the examined monuments and highlighted in the professional survey contribute to reaching this conclusion. Abiding by the international theoretical framework of heritage management when implementing anastylosis is emphasised by professionals (survey). Among the currently followed charters are the *Burra Charter* (1999), which endorses respect for the values and significance of heritage, and the *ICOMOS Charter for the Protection and Management of Archaeological Heritage* (1990), which incorporates conservation and restoration into the wider field of heritage management. Understandably, anastylosis becomes part of the general strategy for managing and restoring archaeological heritage.

In all case studies anastylosis is undertaken to preserve the monument and tackle issues of structural stability and protection against deterioration. Essentially, it also aims at improving the legibility of the structure and presenting it in an educational manner so that it will be better understood by visitors and the general public.

Furthermore, anastylosis decisions do not necessarily involve only re-assembly of members. For instance, architectural sculptures are removed to museums (Erechtheion, Parthenon) due to adverse weather conditions and atmospheric pollution; structural members are displayed or stored near the monument (Lindos Stoa, Trajaneum); non-valuable material is removed and historical phases are preserved (Erechtheion, Parthenon, Lindos Stoa, Celsus Library, Trajaneum, Sagalassos Nymphaeum). In addition, decisions on re-assembling members of the monument (Avaton, Lindos Stoa) found in second usage necessitate consideration of the future of the other monuments. As a consequence, matters are raised that can only be decided with an overall view of the monument and the site in which it is found, which is exactly the target matter of heritage management.

The extent to which preservation and presentation issues influence the extent of anastylosis becomes a matter of speculation and, sometimes, indecision or even decision towards extensive interventions. For resolving this issue, identification and assessment of the values of the monument in question are necessary. Their assessment and consequent respect and enhancement is confirmed in the professional survey too. This is connected with the values attributed to the entire site, in which the monument is found. An indicative example is presented by the Lindos Stoa whose values correspond to the values of the other monuments in the site. Besides, the archaeological and historical values of a site may be enhanced through its restored monuments. For instance, anastylosis of the Avaton and the Propylon of the Gymnasium were decided upon the grounds of elevating the sacred space and defining the boundaries of the ancient sanctuary of Epidauros.

Anastylosis as part of management planning relates to a wide variety of issues raised in the exploration of the case studies and which will be discussed further below (7.6). In general, anastylosis planning and implementation does not just address the individual monument, but also the site in which the monument is located. These considerations can only be tackled with management provisions.

As shown in the case studies and as confirmed by the results of the professional survey, anastylosis is applied in accordance to the international restoration framework. Respect for the values attributed to the monument and their consequent enhancement is a significant approach. The driving forces of anastylosis are almost identical to the driving forces of every conservation and restoration intervention. Authenticity, in all its facets, and integrity are notions seriously considered during anastylosis implementations. The principles of anastylosis, including minimum intervention, and the theoretical contemplation of technical matters derive from the international restoration theory.

In almost all case studies the *Venice Charter* (1964) is the main guiding document, with most of its articles being closely followed and providing the international theoretical framework. Anastylosis implemented according to the charter is particularly highlighted by the restorers of the Erechtheion and the Celsus Library. As the works were undertaken in the 1970's, the charter was the ultimate representation of the evolved restoration theory. In the recent examples (Parthenon, Lindos Stoa, Trajaneum), it becomes apparent that, despite doubts about the usefulness of the charter as a guide, it still forms a valid theoretical framework for the planning and implementation of anastylosis.

Flexibility in abiding by its principles and relativity in interpreting its articles so as to make them more applicable to the anastylosis of each monument is confirmed by professionals participating in the survey. Their assessment of the employed charters stresses that charters are not exactly guides but rather sets of principles. Accordingly, their overly theoretical approaches generate problems when principles are put into practice. This was clearly the case in the Propylon of Epidauros, where difficulties in following the theoretical principles of the charter were admitted. Thus, the individuality of the monument becomes a fundamental consideration in anastylosis; even more in anastylosis of previously restored monuments (Erechtheion, Parthenon, Lindos Stoa). As a consequence, problematic matters are identified in the application of theoretical principles in practice, indicating the need for their clarification for improving the practice of anastylosis and confirming the ideas sustained by Brandi (1996b, 341) and Carbonara (1996, 237) (see Chapter 2.2).

Even in those examples where there was no reference to the *Venice Charter* (Trajaneum, Sagalassos Nymphaeum) the theories guiding the intervention are directly related to it. Professionals participating in the survey confirm that the charter that provides best for anastylosis implementation is the *Venice Charter*. The validity of the current restoration philosophy and theory, its articulation within the specific charter, and its relation with anastylosis become apparent.

Other charters that mention anastylosis – such as the *Athens Charter* (1931), the *Restoration Charter of Rome* (1972) and the *Italian Charter of Restoration* (1931) – as well as charters regarding heritage management and conservation issues, including the understanding and respect of authenticity and values, – the *Burra Charter* (1999), the *ICOMOS Charter for Protection and Management of Archaeological Heritage* (1990), the *Nara Document on Authenticity* (1994) – are also referred in the professional survey. According to the experts, some of these charters were followed in the anastylosis projects they were involved with, though this was not identified in the case studies.

In the Greek examples and the Nymphaeum at Sagalassos, addition of further principles when applying anastylosis is common, as highlighted by professionals in the survey too. These principles were formulated in accordance to the needs of classical monuments (preservation of the structural system with the individual members and their static sufficiency) and monuments subjected to anastylosis before (minimum alteration of their appearance, respect for the past restoration as a historic event), as well as the general restoration theory (reversibility, improvement of legibility, minimum intervention). Thus, an identified need for enriching the concept of anastylosis with further principles deriving from the international restoration theory and the specific requirements of monuments emerges. Guidelines specific to anastylosis could facilitate its planning and implementation, while problematic matters and the ways in which they are resolved could be identified.

Another acknowledged necessity in anastylosis, highlighted in the professional survey, is its redefinition within the charters in a more complex, yet flexible, manner that clarifies the type of material, the connection of architectural elements and the objectives of the intervention and, hence, contributes to understanding the concept and the practice.

From examination of the case studies and their comparison with the results of the professional survey, it is confirmed that anastylosis is a type of architectural conservation and monument presentation. Increase of structural stability, protection of exposed surfaces, as well as arrest of deterioration through re-integration of architectural and structural members in the building contribute to conserving and preserving the monument. In addition, the legibility of the monument is improved, its form is indicated and, in turn, its historical, archaeological, and artistic values are enhanced. Similarly, its educational values, which refer to both the public and the scholars involved in the project and their understanding of the form and architecture of the monument, are increased. In this regard, anastylosis of the Sagalassos Nymphaeum and restoration of its function provided research possibilities.

Multiple reasons, presented throughout the case studies and the professional survey, justify the choice of anastylosis among the wide range of conservation and presentation methods. Accordingly, a fundamental reason is the amount of surviving material, as projected by the experts, who also regard it as the differentiating factor among anastylosis, restoration, and reconstruction (professional survey). In the Parthenon, the Avaton, the Sagalassos Nymphaeum and the Celsus Library, the good state of preservation of the original material was crucial too.

In two case studies (Trajaneum, Sagalassos Nymphaeum) anastylosis was chosen because the existing dismembered parts of the monument could be re-assembled. This reason is strongly connected to aspects of anastylosis being implemented in monuments of a specific structure, as it will be indicated below.

For previously restored monuments (Erechtheion, Parthenon, Lindos Stoa), reasons for selecting anastylosis were the need to stabilise the monument and the method itself, which reflects actions of dismantling and re-assembling randomly compiled and newly discovered members. As dismantled members require conservation, combination of anastylosis and conservation provide for the exact needs of the monuments.

Anastylosis is also chosen for increasing or preserving the static stability of the structure, as highlighted in the Parthenon, the Lindos Stoa, the Sagalassos Nymphaeum, and in the professional survey. Dispersed members are further protected if they are re-integrated onto the structure (Avaton, Propylon, Celsus Library, Trajaneum). Improvement of legibility of the monument forms another crucial consideration (Parthenon, Celsus Library, professional survey). The latter is closely related with enhancing the values of ruined or previously restored monuments, namely educational (Parthenon, Celsus Library, Sagalassos Nymphaeum), architectural (Epidauros monuments, Sagalassos Nymphaeum), and historical and aesthetic values (Sagalassos Nymphaeum, professional survey). Hence, indication of the form of the monument and connection of its members are determinative in deciding for anastylosis and against storing original elements in protected locations. Nevertheless, in the Trajaneum and the Lindos Stoa members not re-assembled – because of their poor state of preservation or their re-assembly necessitating further new material – are stored in areas near the monuments.

Another significant factor justifying the choice of anastylosis concerns its contribution to understanding the archaeology, architecture, and construction of the building in question. That becomes apparent in the Trajaneum and the Sagalassos Nymphaeum and is strongly emphasised by professionals in the survey. Experts also underline the important role played by the retention of monuments as material culture, the values of the surroundings and the setting, and the recovery of the vertical dimension within the site.

As shown above, it is established that anastylosis is defined by the re-assembly of original members on the building, whether these members survive dispersed around the monument or are dismantled and conserved. A great amount of them should be available. Furthermore, re-assembly of elements in their original locations is regarded as determinative of anastylosis (Trajaneum) – this issue is discussed below.

Anastylosis also includes or is employed in combination with other intervention and conservation treatments. For instance, in the monuments of the Athenian Acropolis and in the Lindos Stoa conservation and stabilisation work is undertaken in order to amend the deteriorated state and improve the stability of members previously re-assembled and in order to tackle the effects of atmospheric pollution. Conservation work is also undertaken to avert destructive effects of natural phenomena and visitor wear (Epidauros monuments, Lindos Stoa). However, professionals participating in the survey consent that surface conservation and protection against weathering and pollution are reconstruction features. We should be aware, however, that reconstruction uses mainly new material, therefore, there is no need to conserve and protect it against weathering and pollution, at least not in the first stages after reconstruction. In addition, in monuments subjected to anastylosis planned maintenance works involve conservation of surfaces and elements, so as to guarantee their stability and durability in the long term. Hence, anastylosis entails active conservation before and after the actual intervention.

Besides, anastylosis is chosen to protect structural and architectural members against current and future deterioration (Epidauros monuments, Lindos Stoa), as they will be protecting each other with their weight. Transfer of original members to a museum and their replacement by copies may also be undertaken and is defined as passive conservation (see Dogani *et al.* 1994, 49-58).

There are cases, such as the Avaton and the Lindos Stoa, in which anastylosis comprises restoration of certain parts. In the Propylon, the interchangeable use of the terms *restoration* and *anastylosis* led me to conclude that these two interventions are not clearly differentiated. The argument of the restorers of the Sagalassos Nymphaeum reinforces the above remark. According to them, anastylosis is not distanced from other types of intervention to monuments. Conversely, it is considered similar to restoration. Likewise, in line with the results of the professional survey, anastylosis means re-assembly and it is included as such among restoration interventions. The individual needs of the monument, i.e. its state of preservation, define the way in which the intervention is implemented. The factor that differentiates the two methods (see Sagalassos Nymphaeum), and with which I agree, is the type of monument – a stone structure, either totally or partially dismembered.

In addition, approximate restoration of the form of the monument with anastylosis is highlighted in almost all case studies. In the professional survey, it is suggested that restoration simply means restoration of the form of the monument, an idea that comes across as slightly confusing, because the form of the structure can also be indicated with re-assembly of its members, thus, anastylosis.

Proposals are made for including reconstruction work in anastylosis of particular monuments. In the Avaton, reconstruction of the wooden beams of the ground floor of the upper stoa was suggested. In the Lindos Stoa and in the professional survey, limited use of surviving material is acknowledged as contributing to identifying the intervention as a reconstruction approach. These suggestions ascertain the differentiation between anastylosis and reconstruction, since the latter is employed without original material having survived and it almost equals rebuilding (see Celsus Library). The Trajaneum restorer offers one more differentiating factor, the engineering approach to the monument – if extensive then we are implementing reconstruction, if less interventive then it is anastylosis.

However, from the professional survey it seems that anastylosis is considered as either restoration or reconstruction or an amalgamation of both. Differentiation between anastylosis and restoration or anastylosis and reconstruction emerges from insertion of new material as either integrations or connecting material. Additionally, the results of the visitor survey underline that, for the public, anastylosis is not clearly defined or understood. For them, either it covers a variety of interventions or its extent differentiates it as repair, restoration, or rebuilding.

Nevertheless, anastylosis is indeed considered a minor intervention with diverse aspects. When employed in previously restored monuments (Lindos Stoa), interventions do not essentially extend to the entire structure, but only where the most serious problems are presented. Besides, comparisons of anastylosis and reconstruction (Lindos Stoa, Celsus Library, Trajaneum) show a preference to anastylosis, rationalised as a preference towards less interventive approaches.

Aspects of anastylosis also include non-intervention, such as the storage of surviving material not re-integrated into the monument. This is the case in the Lindos Stoa, the Pergamon Trajaneum, and the Sagalassos Nymphaeum, due to difficulties in identifying surviving members or due to their bad state of preservation.

Anastylosis is considered by many, especially the restorer of Trajaneum, to be directly related to archaeology, architecture, structural engineering, and conservation, depending on the problems presented by each monument. It can be concluded that anastylosis forms an architectural conservation method, not necessarily employed in itself but comprising further actions with different objectives and features that can be implemented separately or in combination. Alternatively, the term encompasses every kind of intervention to a classical monument. Interestingly, professionals seem to agree that a definition of anastylosis with regard to restoration and reconstruction does not really matter and that we cannot put definitions in limited classifications.

From exploration of the case studies and the results of the professional survey further details on linking anastylosis with particular types of structures and specific geographical locations emerge. They confirm the ideas presented in the literature review (Chapter 3) that anastylosis applies to monuments originally erected with regularly cut pieces of stone, connected to each other with little or no mortar or with small metallic joints. Specifically, professionals underline that the structure of monuments and the type of original material, given its availability and good state of preservation, play a central role in deciding and applying anastylosis.

The dry masonry, which is considered to allow for restitution of the original shape (Chapters 3, 6), differentiates those monuments from structures with mortars and cramps. Dry joints and stone members signify that the structure is laid out with individual elements, and this is stressed by the experts too. The dry joints, if not found, can be replaced by new ones, which entails limited introduction of new material. But if mortars and cramps are to be replaced, then the amount of integrated new material is increased. Extensive introduction of new material in anastylosis is only noted when integrating new members, even though they may not have to replace or complete original ones. For structural reasons and if a considerable amount of architectural elements survives, not many new ones need to integrated. Therefore, this factor differentiates anastylosis from reconstruction.

In the Sagalassos Nymphaeum it is stated that the type of monuments is what differentiates anastylosis from restoration. Hence, in order to implement anastylosis the structure has to be totally or partially dismembered. Questions may be raised with regard to the building material. It is accepted that anastylosis can be applied to structures made of stone (Chapter 3). The reason is that stone or any other durable material has better chances of surviving time, thus, much original material will be present around the ruin. Elements may need completions or some new members may have to be produced for structural reasons. Monuments of this type of material follow in most cases the specific architecture and structure with dry joints, minimal connections, and individual members. Therefore, anastylosis means re-assembly of dismembered parts of a monument.

The fact that structures with this architecture and structural system may be found in different geographical locations entails that anastylosis has variable applications throughout the world. This is also confirmed by the professionals participating in the survey, who name diverse places, such as Cambodia. Yet, many monuments of this specific structural type are encountered in the Mediterranean region and are dated to classical antiquity. These structures present similar issues, as noted through the case studies. There are such monuments in Italy, Jordan, and so on. In this sense, this study on anastylosis relates to the conservation of classical monuments located in Greece and Turkey.

What deserves further discussion is the comparison of the concept and practice of anastylosis as applied to ruined monuments and to previously restored ones. This observation derives mainly from the case studies, specifically the monuments of the Acropolis of Athens and the Stoa of Lindos. In the Erechtheion, the undertaken intervention was described as restoration of a restoration, articulating the difference between a ruined monument and a monument previously restored.

In the case studies I distinguished variations and similarities regarding this issue. Similarities are noted in technical and practical matters, such as the research conducted before and during the intervention, the introduction of new material, efforts to find appropriate material for integrations and connections, the joining technique, and so on. It should be borne in mind, though, that occasionally the technical approaches may differ, according to the needs of the monument. Other interventions, such as active conservation and stabilisation of elements, may be included in both cases. The theoretical framework guiding anastylosis in either ruined or restored monuments is the same, even though some flexibility becomes necessary in order to care for their particularities. All case studies and the professional survey underline that each monument has different needs and may require variable approaches. Similarities are also found in the aims sought to be achieved through anastylosis, even though delicate differences emerge. For instance, the structural stability of a ruined monument will either be reinstated or improved through anastylosis, whilst it will simply have to be improved in a previously restored monument. Legibility and values are radically enhanced if a ruined monument is subjected to anastylosis in contrast with a previously restored monument, where they are merely improved.

The major observed difference becomes the fact that a ruined monument may survive with some members on the structure and some dispersed around the monument, whilst a previously restored monument needs to be dismantled so as to be re-assembled again. The majority of original material is already integrated in the structure and further material may be recovered from additional excavations and research. In this respect, the action of dismantling raises the degree of intervention. However, in some examples (Erechtheion, Lindos Stoa), no action is taken if dismantling is not judged crucial.

Furthermore, what is actively sought in anastylosis of previously restored monuments is minimum alteration of the appearance of the monument (see monuments of the Athenian Acropolis), as it has been established in the consciousness of people since the last intervention project. Although, this is not entirely possible, a certain compromise should be reached.

What is also worth exploring about the concept and practice of anastylosis is the relation between theory and practice. In the case studies, I clearly concluded in the strong link between the theoretical and technical aspects of anastylosis. That was particularly noted in the Erechtheion, while in the Lindos Stoa the theoretical framework being adapted to confront technical problems reinforced that conclusion. Professionals in the survey also consent that anastylosis is and should be subjected to a theoretical approach to restoration principles and that its planning and implementation are related to application of principles and the method itself (as re-assembly of dispersed members). Thus, it forms a technical solution that consists of a theoretical framework. Yet, doubts are raised in this regard. According to one of the Parthenon restorers, we need to free ourselves from theoretical and philosophical speculations in order to tackle technical matters (Korres in CCEM 1987a, 59-60). However, theories have developed and evolved through time, which entails their significance in practices. Furthermore, throughout the case studies the theoretical questioning is never left aside. It is rather used in combination with resolving technical problematic matters or, at least, gives general guidance to the project.

The success of the examined anastylosis projects comes under scrutiny. The advantages of the undertaken anastylosis in the case studies are found in exactly the aims sought to be achieved: improved conservation, recovered structural sufficiency, enriched research on and knowledge of the monument, enhanced legibility and educational potential, and augmentation of values. Nevertheless, in most cases the disadvantages concern the extent of intervention, which is often increased as a consequence of introducing great amounts of new material, and the effects on authenticity. Other drawbacks are the integration of the restored monument into a ruined site if there are no provisions for the surroundings, as well as the complete reliance on the restored form of the monument to achieve education for the public. This contributes to anastylosis developing into an intervention too ambitious with regard to its educational result, with the subsequent result of extending the degree of intervention to achieve it.

In terms of aesthetics, the final results are difficult to judge. This is also confirmed by the visitor survey, in which no tendency towards what is considered successful or not is observed. This relates more to aesthetic preferences. In a way, anastylosis is successful as it indicates the form and image of a ruined monument or may even correct it, if the monument has been restored in the past. However, in the Parthenon it is pointed out that the implemented works are bound to be more successful because of the experience of the Erechtheion anastylosis. Generally, implementation of the method in many monuments in Greece has resulted in improved approaches.

7.3 Why is it important to define principles and standards of the concept and practice of anastylosis?

Throughout the review of cultural resource management and anastylosis (Chapters 2, 3) the significance of anastylosis as a term, concept, and method is highlighted. The examination of case studies and the results of the professional survey reflect and confirm that.

The historical overview indicates that anastylosis has a long history. It has been endorsed by the *Venice Charter* as a justified form of architectural conservation. Its wide applications on classical monuments of the Mediterranean region, as well as its broader applications throughout the world, and its frequent implementation in accordance to the international conservation and restoration theoretical framework emphasise the validity of anastylosis as a concept and practice. The argument made through the professional survey for a more complex and thorough definition and its confirmation from the analysis of the answers; the effort and time spent on subjecting monuments to anastylosis; the driving forces influencing its manner and extent; the theoretical questioning; the employed advanced technological methods; and the debates and issues raised reinforce the idea that anastylosis is a viable and significant method for restoring and presenting monuments. Furthermore, its impact on the preservation and interpretation of individual monuments and its proven inclusion as a strategy of site management contribute to concluding that anastylosis is more important than given credit for. Hence, its thorough understanding will qualify it as an approved and successful architectural conservation and interpretation method.

7.4 What are the driving forces that dictate anastylosis implementation and why?

The driving forces that dictate anastylosis implementation, briefly discussed in Chapter 3, are clearly identified through the professional survey and the case studies as interpretation, improvement of legibility and education, as well as tourism and identities. The professional survey underlined that driving forces do not necessarily take priority over each other but may equally influence the decision on and manner of the intervention.

Improvement of legibility, interpretation, and education are interrelated, while experiment and research provide education, mainly to experts but also to the public. As highlighted in the anastylosis of the Celsus Library, anastylosis made the monument better understood by the public, and professionals enriched their knowledge of ancient architecture through the intervention process.

These strongly connected driving forces form crucial factors influencing the decision, implementation, and extent of anastylosis, as it becomes evident in the case studies. This is also admitted by professionals in the survey, with a slight preference towards improvement of legibility and interpretation, rather than education.

Initially, didactic values were considered an anastylosis principle (see Erechtheion), rather than a driving force of the undertaken works. Most anastylosis projects are undertaken to improve the legibility of the structure, and, therefore, its interpretation. The form of the monument is indicated and its three-dimensional existence is attributed. These annotate the so-called didactic values inherent in a monument that enhance the education of both experts and the public about ancient architecture and archaeology.

In this regard, the concept of *didactic anastylosis* (Chapter 3) emerged in the Greek context in the 1980's promoting an educational aspect of anastylosis that is considered intrinsic in it. The concept often appears in the Greek case studies, particularly in the Avaton. Education and didactic values address the public and the experts. They are achieved not only as a result of viewing a restored monument but during the process too. As I suggested in Chapter 3 and as it derives from the case studies and the professional survey, educational values are crucial and deserve all due respect when applying anastylosis, yet, they can be achieved through a combination of methods. Anastylosis forms a method fulfilling both preservation and presentation of monuments; in its nature it is not only educational and, thus, it cannot be implemented with one of its aspects taking priority.

On the other hand, in previously restored monuments (Erechtheion, Parthenon, Lindos Stoa) their image is not drastically altered. Simply, their didactic values are improved and maybe rectified – if the past restorations were not entirely correct – rather than radically annotated.

In other cases (Parthenon, Avaton), the educational values of the monument are related to its social role, through a free interpretation of Article 5 of the *Venice Charter*. This entails that 'socialisation' (see Bouras 1983c, 401-405; 1985b, 88-89) of the monument concerns its inclusion in the activities and interests of people. The restored structure appeals more to people, by being better understood and present in their everyday life. It is in this way that the public is considered to be benefited.

The subsequent issue regards the effect on the extent of intervention. Educational values are projected to justify quite extensive interventions, because education and understanding are not considered easily achieved through limited interventions. This is openly admitted by professionals in the survey. Throughout the case studies the visitors' apprehension of the ruined monument becomes central in anastylosis decisions. Interestingly, in the visitor survey the public demonstrates awareness of the importance of anastylosis for their understanding and education in terms of history, archaeology, and ancient architecture. However, a tendency to underestimate the public is noted in most case studies. So, extensive interventions become the solution, even though the current theoretical framework is centred on minimum interventions and respect for authenticity. This is indicative in the Greek case studies in which the extent of intervention seems to go beyond the expected limit. The only case where simply motivation of the imagination of the people is sought is the anastylosis of the Pergamon Trajaneum. A modest approach is adopted by its restorer, who admits that they do not have all the answers but can encourage acquisition of knowledge and understanding of the monument.

Given the above speculation, questions emerge with regard to how education can be achieved without affecting the extent of anastylosis. Various means, such as models, drawings, videos, diagrams, signs within the site, and so on, even experimental archaeology, derive as ideas from the case studies and the suggestions by professionals. Their disadvantages centre on the lack of experiencing the volume and details of ancient architecture. Yet, finding an acceptable compromise between intervening in a monument and accompanying anastylosis with explanatory and interpretative material is feasible.

An interesting idea for achieving education and interpretation for the public becomes the use of multimedia and virtual representations. Such an example is provided by the 3D MURALE project, which aims at virtual anastylosis in order to improve the legibility and enhance the interpretation of the ruined monuments of Sagalassos. It is acknowledged as a significant tool for archaeological interpretation. As expected, its use as a means of advanced technology depends on the available financial resources. On the other hand, questions similar to those raised during the course of anastylosis emerge (such as the degree of differentiation between new and original members, the possibility of existing alternative interpretations, and so on). We should acknowledge, though, that such solutions affect neither the material nor the form of the monument, nor do they raise questions on the extent of the intervention.

The necessity of explanatory material is reinforced by the argument that other aspects of the life and existence of the monument possibly will not be understood. In the Celsus Library, despite attention paid to the extent of the intervention and the care given to applying anastylosis, it may not be entirely clear to everybody how the monument functioned. Its form and image, not its function – a heroon-nymphaeum and a library, became clearer. On the other hand, the Sagalassos Nymphaeum re-acquired its original function. This was decided and achieved due to the amount of surviving material that was re-assembled and the research conducted in order to re-establish its function. However, a monument can never be entirely contextualised, as it was built in a different era and with different socio-cultural and political expressions. The public and the experts are benefited from variable aspects of the process and success of anastylosis. Learning and understanding should never stop though. This is why anything that can contribute to increasing interpretation, education, and research should be welcomed, or at least seriously considered.

Tourism becomes an important aspect of anastylosis decision-making, being closely related to issues of interpretation and education, as well as financial development. On the one hand, improved legibility and enhanced education will make the monument more easily understood to the general public and the visitors to the site, thus, tourism will develop. Increased tourism conveys money to the site and, hence, possibilities for caring for the monument and the site are created, while the local area and its population benefit from the generation of income. Since most Mediterranean countries rely on tourism for revenue, tourism development should not be neglected. At the same time, tourism has also negative implications related to the wear caused to the heritage resource if it is uncontrolled. This is why tourism development may be looked upon with a certain dismissal and considered as a driving force that negatively influences anastylosis and heritage management decisions. However, in Ephesus, tourism is quite obviously a driving force for implementing anastylosis to the Celsus Library and initiating restoration of other monuments of the site. The same is valid for Trajaneum whose restorer admits that anastylosis was, among others, a gesture of economic help towards the country. Additionally, in Sagalassos, anastylosis was a prerequisite to get permission by the Turkish authorities for excavation and research.

Yet, according to the professional survey and the Propylon anastylosis, financial reasons connected to tourism development influence those who provide the funding and the resources to undertake the works. Restorers and managers only admit they were influenced by tourism in decisions when the income from tourism is not directly related to them and they do have any financial gain. In Turkey, tourism revenue concerns the authorities while the archaeological expeditions do not have any involvement with it. In contrast, in Greece those responsible for anastylosis are employed by the relevant authorities and are natives of the country. Hence, acknowledgment of being influenced by tourism, as translated into economic benefits, is absent for understandable reasons. Interestingly, the public does not seem judgemental of the financial benefits from anastylosis, they would be rather content with increased tourist numbers, although they would not implement anastylosis for increasing visitation. These ideas balance negative connotations that tourism has acquired regarding its impact on the sustainability of a site.

Given that tourism is related to advanced interpretation of the monument and education for the general public, its sheer development can only be beneficial and entail that safeguarding and appreciation of archaeological heritage have been achieved. There are examples (see Sagalassos) of tourism increase in relation to developing a conservation program in the archaeological site, without diminishing from professional approaches. Alternatively, the only way to deal with the negative aspects of tourism, since uncontrolled visitation to a site contributes to deterioration of the structure and its fabric (Epidauros monuments, Celsus Library), is to invest in visitor management planning.

The national and cultural identities of people are a determinative force in anastylosis and other restoration and reconstruction examples throughout the world (Chapters 2, 3). Professionals in the survey emphasise that monuments represent the heritage richness of a country.

Regarding previously restored monuments, respect of the past restoration as a historical event is linked to the idea of not altering the image of the monument as established in the memory of people. This was clearly the issue in the monuments of the Athenian Acropolis and the Stoa of Lindos, in which alterations to their image would symbolise alterations in their history and character.

A considerable aspect is the gravity of national identity, although professionals do not seem to be so much influenced by it. It was more influential in the past – in the 19th century Europe where national states were formulated and in Greece at the end of the 19th and the beginning of the 20th century, when anastylosis of significant monuments was considered to have the potential of strengthening the identity of the Greek nation. Because national identity has often been abused to serve political goals, by restoring phases of particular periods of the life of the monument and the site, it is not always seen in a positive light. Such an example is offered by the anastylosis of the Lindos Stoa by the Italians in the 1930's, whose aim was the appropriation of the past of Rhodes in order to establish them in the area. In this sense, acknowledging the biases governing restoration of the archaeological heritage of a particular nation, when monuments of different periods co-exist in the same site, is absolute in the professional survey. In the examined cases, such comments are made regarding the issue of past anastylosis projects focusing on particular periods of the history of the monument and the site.

Additionally, survey participants verify that different results may be produced when a native restores a monument of their ancestral heritage compared to anastylosis undertaken by a non-native restorer. Such issues did not emerge in the case studies, even though anastylosis of the examined Greek monuments is undertaken by Greek professionals, while anastylosis in the Turkish examples is undertaken by foreigners. Yet, national identity forms a sensitive political issue that is not expected to be openly discussed. It would, therefore, be worth examining whether such differences exist in practice by exploring anastylosis works undertaken in specific regions by natives and non-natives.

Lately, national identity, as shown in the Parthenon anastylosis, is looked upon in the sense of the long history and symbolisms represented by the monument in question and not from a nationalistic viewpoint. Its impact is also reflected on the effort and resources spent on the specific monument because of its symbolisms and in comparison to other monuments in Greece. In this regard, it should be considered, and this is confirmed in the survey, that the Acropolis monuments actually represent the classical heritage as the important heritage of the Greek nation, as well as of the western civilisation. Thus, no direct political issues affect decisions. This, however, cannot be said for other parts of the world or the Mediterranean. Indicatively in Ephesus, anastylosis of the Celsus Library and, thus, reinforcement of the presence of the Hellenistic and Roman civilisation in the area promote the monument and the site as a symbolic link between Asia and Europe.

Despite the above, the use of the Library of Celsus as a place for social gatherings and performance of cultural events indicates that anastylosis may be decided upon for the impact it may have for cultural identity and for the socialisation of monuments, in a way similar to which promotion of educational values in anastylosis of Greek classical monuments aims at their inclusion in society and everyday life. The public, according to the visitor survey, seems to consider the impact of national or cultural identity in a positive light.

7.5 What are the problems and complications associated with the application of the method and how do they arise?

In Chapter 3 the terminology and etymology of anastylosis have analytically been presented while variations in the use of the term in different contexts have been highlighted. The professional survey presents interesting ideas concerning terminology. Primarily, experts uphold that in the Greek context *anastylosis* comprises various degrees of intervention rather than merely re-assembly of dispersed members of a structure. This is confirmed by the interventions undertaken in the Greek case studies. Professionals clarify that differences in the spelling and etymology of the term determine its differentiation from restoration. For instance, in the Italian and the Turkish context *restoration* covers all kinds of intervention.

However, as it has already been discussed, the establishment of anastylosis as a term and concept is in complete accordance with its international definition. Yet, factors, such as the type of structures and original material, as well as the amount of integrated new material, differentiate anastylosis from other interventions. These factors should be included in its thorough definition.

Theoretical and philosophical aspects are not very different. In my opinion, theory is directly related to technical matters while the philosophy of the method can be discussed in an abstract manner and by taking into account that subjective observations and judgements should be expected.

The only matter that is equally theoretical and philosophical is authenticity. After the World Heritage Convention (1972) and the Nara Document (1994), the introduced references of authenticity have made the concept less relative and abstract and more applicable in practice. Yet, its discussion in relation to aesthetics and with regard to the creation of artificial and modern ruins is more philosophical.

From the well-known references of authenticity (form and design; materials and substance; use and function; traditions and techniques; location and setting; spirit and feeling) only those that have spiritual and functional connotations (use and function; spirit and feeling) are excluded from relevant discussions in anastylosis. From the case studies and the professional survey it emerges that authenticity is expressed in aspects of the architecture and construction of the monument. Authenticity of form and design can be achieved by finding the original structural positions of members, preserving the historical phases of the monument, and respecting the original structural system and the way and form in which the structure has survived through time. Authenticity of materials and substance is respected by using natural stone, reintegrating all available surviving material, avoiding introduction of great amounts of new material, applying protective and conservative measures to original members, and by showing respect for the original material. Authenticity of traditions and techniques is shown by employing well-trained stonemasons to work on the stone, and by utilising traditional tools. Lastly, authenticity in location and setting is achieved by restoring the monument *in situ* and preserving the site and the surrounding monuments.

Authenticity is affected by extensive interventions (Parthenon) but carefully planned works can preserve it. In the case studies and the professional survey, noted tendencies focus on respecting the authenticity of the monument and its material rather than its original form (see Chapter 3). The public is also judgemental regarding the impact of anastylosis on the authenticity of a monument. Often, though, it is acknowledged that authenticity is an abstract and relative concept. This is the reason why it becomes impossible to confirm whether the final result is authentic or whether all facets of authenticity were respected (Erechtheion).

Monuments subjected to anastylosis are preserved in fragmentary ways and these ways are neither authentic nor do they recreate the building, simply because the form, image, and function of the monument are not fully regained but rather indicated (Lindos Stoa, Celsus Library). This is actually the aim of anastylosis, as in many cases its objective becomes the indication that the monument has been re-erected and it has not survived like this (Pergamon Trajaneum). Yet, monuments can be fully restored, but in this sense their material and substance would not be authentic. Hence, by striving for one aspect of authenticity another one may be lost. This is why I agree with the relativity and un-attainability of authenticity, though the concept should be thoroughly contemplated, as professionals suggest. Because ruined monuments are relics of the past and their improved presentation and safeguarding are realised through intervention, anastylosis can never present the monument in an authentic manner. Nonetheless, the ways in which authenticity is expressed provide us with an indispensable view of intervening to a monument with the utmost respect.

Aesthetics are closely related to authenticity and to judging the final result of anastylosis in terms of enhancing the aesthetic values of ruins and creating artificial or modern ruins. Realistically, anastylosis results in ruined monuments neither becoming entirely comprehensible nor remaining romantic ruins. They are simply indicated according to how they may have originally looked (Erechtheion). Yet, I should acknowledge the difficulty of judging the end result from an aesthetics point of view (see Erechtheion and Avaton), even more in cases where anastylosis is employed so as to correct past mistakes (Lindos Stoa). However, it is important to speculate and question the aesthetic result, since such considerations and criticism could improve certain aspects of aesthetics in restored monuments.

An idea of how to view the aesthetic result of anastylosis is given by the restorer of the Lindos Stoa who emphasises the harmonious appearance of the restored monument to the non-specialist public and its representation according to the rules and forms of Hellenistic architecture. This criterion is also reinforced by assessing the anastylosis results in the case studies and by some questions raised by anastylosis professionals involved in the examined monuments or participating in the survey. Additionally, gravity is placed on the differentiation and harmonious integration of new and original material, a principle strongly advocated in the *Venice Charter*.

Concerning the concept of *artificial or modern ruins*, it is probably wise to admit that the result of anastylosis is judged as such, simply because the created ruin has its own aesthetic qualities that do not necessarily correspond to the aesthetic qualities of the original monument. The examined monuments in which anastylosis is complete may be regarded as artificial ruins, since the ancient structure is not presented as it was found nor as it has survived through time (Celsus Library, Trajaneum). If presentation as found or according to the way in which it survived were selected the restorers would have done absolutely nothing. If the choice was directed towards recreating the form and image of the monument, then we would have to resort to complete reconstructions. Since extensive intervention is not the aim of anastylosis, we conclude that the aesthetic result cannot be harshly judged, anastylosis strives for improved presentation and enhanced values, rather than recreation of monuments.

Related to the above is the concept of *dead and living monuments* (Chapter 2). Although in recent years the concept is excluded from the international restoration debate, some interesting comments can be made. Even though monuments form part of our heritage and, thus, our past, they are still 'present' in our present. In this sense, they are *living monuments*. Even so, they can still be perceived and distinguished as either monuments belonging to a past and distant culture or monuments forming living specimens of existing cultures and religions. For the latter, full preservation or reconstruction is needed. For the former, monuments do not need to survive in their original form and achieve their original function to be reminders of the past civilisation or culture they represent. It is in this category that monuments of classical antiquity fall. Thus, the concept could prove useful for restorers in terms of limiting the intervention to the absolute necessary or to proceed with intervention with clear articulation of its objectives and confirm that minimum interventions should be guiding principles in anastylosis. Despite the endorsement of the principle of minimum intervention by the architectural conservation theory, anastylosis may still be extensive.

The theoretical framework of anastylosis has been discussed above (7.2), when referring to anastylosis applications within the current framework of international restoration theory. Using the *Venice Charter* was explored through the inspection of case studies and the ideas emerging from the professional survey. Some principles of the charter merit further study.

Removal of architectural sculpture or members is a matter emerging in some case studies (Erechtheion, Parthenon), due to the atmospheric pollution damaging elements of artistic and architectural significance. Decisions on their transfer to the site museum are in accordance to Article 8 of the *Venice Charter* and for reasons of respect for the original material. They are undertaken after all other options are explored. Authenticity and aesthetics, as well as educational reasons, play an important role in replacing original members with copies. Additionally, their storage and exhibition into the on-site museum means that they would not be entirely deprived of their original context. The only conclusion is that meticulous consideration and assessment of options, as well as consultation of all stake-holders, including the experts and the public, is essential.

A fundamental issue is the respect for original material as advocated in Article 9 of the charter. In the case studies, it is shown through careful handing of original members and avoiding any new work on them; use of ancient and past – from previous anastylosis – connecting points; preservation of historical phases; long-term research to acquire extensive knowledge of the monument; minimum additions that respect all parts of the structure; respect for the character of the ancient construction; and avoidance of conjecture. However, in previously restored monuments (Erechtheion, Parthenon, Lindos Stoa) it becomes quite difficult not to intervene in original parts either because newly discovered members need to be integrated or due to having to remove the damaging material of past restorations. Consequently, the respect for original material has multiple facets. This is probably where the argument against the generality of the charter's theoretical framework is based.

Another theoretical matter concerns the respect for the 'valid contributions of all periods' to a monument, according to Article 11 of the charter. Diverse expressions of this principle in the case studies highlight the factors that may surface through the course of anastylosis. In previously restored monuments (Erechtheion, Parthenon), later historical phases and interventions are preserved (particularly those of the last restoration) and materials from the past anastylosis are removed, because they are judged not valuable. However, in monuments restored in the past the 'valid contributions of all periods' may not exist anymore. For instance, in the Parthenon, the remains of a mosque were removed during its first anastylosis, while in the Lindos Stoa, the past anastylosis removed all remains not related to the Hellenistic period. Preservation of the image and the form of the monument, as it has derived from past restorations, is aimed at in both monuments, though some changes are inevitable. Hence, preservation of historical phases is perceived in a multilateral way rather than simply in the existence of the monument in one historic period.

Regrettably, although respect for historical phases is declared in theory it does not always happen in practice. An indicative example is found in the Parthenon, where some Byzantine wall paintings survive but the actions regarding them are not clear. Furthermore, in cases where diverse historical phases exist within the monument (Celsus Library, Sagalassos Nymphaeum), the question involves which phase should be preserved and how such a choice will be made – depending on the survival of original material or the significance of the phase or both (Celsus Library).

Throughout the case studies and from the results of the professional survey the significant role of values in anastylosis becomes obvious. Article 3 of the *Venice Charter* endorses improvement of artistic and historic values, yet, with time, more types of values have been identified and interventions aspire at their annotation (Chapter 3). Anastylosis in the examined monuments aimed at augmenting artistic, aesthetic, archaeological, architectural, scientific, historical, and educational ones.

In general, I noted that neither much discussion nor a systematic analysis of the values attributed to monuments takes place, though their functional and social values are considered to embrace every other component of the significance of the monument. We should acknowledge that methodical assessment of the broad range values and significance of a monument will aid its understanding, as well as the judgements on the ways in which it can be safeguarded for current and future generations. This forms a central point of the current restoration philosophy.

Professionals emphasise that the aim should be to reach a balance among them. If, in the process of anastylosis, values are destroyed then the intervention is unacceptable. Additionally, monuments form part of a greater context, archaeological sites with many buildings and structures, hence, the values of each monument should be established in relation to the site too.

As indicated above (7.2), additional principles were established in the theoretical planning of anastylosis. Among them, reversibility has been extensively deliberated throughout the Greek case studies and the Nymphaeum at Sagalassos. Authors do not use the term with consistency in the case studies. Its perception somehow differs in Greece where it is a quite general principle, whilst in Turkey it is connected with the architecture of the monument and it is completed by specific attributes (retreatability and compatibility). Yet, reversibility enables future dismantling of the monument and re-assembly with further original material, if discovered. It is secured with minimum interventions on original members and with detailed recording of undertaken actions (Erechtheion, professional survey), as well as by technical experience and the assistance of modern technology (Avaton). Technological advances are closely connected to the definition of reversibility, which, according to the restorers of the Sagalassos Nymphaeum, is complemented by the notion of retreatability of treated surfaces and the compatibility of treatment materials. To achieve these notions, technological advances for employing material compatible to the original and ensuring treatments of damaged material are crucial.

Defining and achieving reversibility is constantly under question, as the notion is considered to have a relative value. The fact that anastylosis can be undertaken in previously restored monuments could entail that all intervention actions to a monument are reversible. For instance, damages occurring to the structural elements of the Acropolis monuments and the Lindos Stoa are in a way reversible, since members are dismantled, conserved, stabilised, and then re-integrated to the building. In this regard, the past damaging anastylosis is reversible, even though some elements cannot be re-integrated due to their bad state of preservation. Hence, ensuring that no damages are inflicted on the fabric and structure of the monument is essential for achieving reversibility.

Accordingly, the suggested concepts of retreatability and compatibility enrich the notion by establishing standards for its attainability. The structure of the monuments subjected to anastylosis is compatible with actions of dismantling and re-assembly. Consequently, reversible treatments are possible. Additionally, experts participating in the survey underline the importance of defining reversibility through various facets, such as reversibility of structure and reversibility of restored blocks. In examining the Erechtheion, I highlighted that the significance of reversibility is found in the theoretical possibility to reverse the action, rather than the practical application of the notion. It would be extremely difficult to undertake anastylosis again if further members are found, unless they are of exceptional value. Thus, establishment of what would justify such an action seems to be necessary for complementing the definition of the notion. Further drawbacks are found in that achievement of reversible interventions may encourage extensive interventions. Thus, reversibility should also be defined in relation to minimum interventions.

Minimum intervention theories are dominant in the international restoration theory (Chapters 2, 3). Exploration of the case studies confirms that the professionals involved in the projects are concerned with the extent of anastylosis. Only in the Sagalassos Nymphaeum minimum intervention is clearly articulated as the guide that led the theoretical approach to the anastylosis. Thus, I came to the conclusion that minimum intervention is frequently regarded as a convention rather than a strict principle, while the aim of restorers becomes the limitation of extensive interventions. This is understandable, as anastylosis forms a method for preservation and presentation of the monument, hence, its inherent educational potential affects decisions on the extent of the undertaken actions. Apparently, in most examined projects, particularly in the Parthenon and the Propylon, improvement of legibility, enhanced interpretation, and, most importantly, increase of the educational values guide the manner and extent of anastylosis.

Other factors influencing the extent of anastylosis are the amount of surviving material (Trajaneum) and its state of preservation (Sagalassos Nymphaeum). This is reasonable due to the intervention requiring re-assembly of original dispersed members. If not enough members survive or if they survive in a state that their reintegration is impossible, then we cannot re-assemble them. From a general perspective, the extent of anastylosis seems to be affected and defined by both theoretical and technical aspects (see Erechtheion). This approach is illustrated in decisions on extending the re-integration of new elements to parts where not much original material survives, for reasons of interpretation and structural stability.

In some cases, proposals for proceeding with reconstruction were also made. Suggestions for reconstructing the roofs of the monuments were justified by projecting various reasons (better protection in the Erechtheion; protection against weather conditions and enhancement of architectural and aesthetic values in the Parthenon – the only monument in which some original material existed; mainly for educational reasons and less for structural reasons in the Avaton). Essentially, gravity should be placed on finding modest solutions. Those involved should not get carried away by the wide range of reasons to extend the intervention when no original material is available.

In this regard, the amount of surviving material should be the determinative factor in deciding at which point the intervention should stop, together with careful consideration of the effects on authenticity and structural stability, as well as of respect for the original fabric. I certainly agree with the statement by a professional in the survey who centres the whole issue around two questions: the *why* and the *up to what extent*. In this regard, the reason (*why*) should be determined by assessing the values of the monument.

Numerous technical matters are raised during the course of anastylosis. Most of them have been extensively discussed in the case studies. Here, some of them will be further analysed.

A central matter regards the amount of original material that survives and the incorporation of new material. It becomes an issue, as limited introduction of new material is a determinative factor of the method. In most case studies, the amount of surviving material is quite high (Avaton; Celsus Library, Trajaneum, Sagalassos Nymphaeum), in others not that high (Propylon). Many experts, as indicated in the literature review, agree that the majority of original elements should be preserved. Survival of sufficient amounts of original material guarantees their re-assembly to the monument. Several experts, according to the survey, consent to the above statement, since, as it was said, 'anastylosis would not make much sense otherwise'.

The issue relates to whether there should be a defined amount of original material or an established amount of acceptable new material. The reason prompting me to enquire after the establishment of such a variable was the fact that in some case studies no information was provided regarding how much original material survived (Avaton, Lindos Stoa, Sagalassos Nymphaeum). In the Celsus Library the references to original material were different (either 75% or 90%), obscuring issues about the extent of anastylosis, as it was unclear what survived and from which part of the structure. Generally, information on the amount of original material and the quantity of integrated new material should be a matter of scholarly study.

Disagreement over the establishment of such a variable emerges because anastylosis experts project that everything depends on the state of preservation of the material, the structural stability of the monument, and the knowledge of its architectural form. These render the establishment of a desired amount of surviving material impossible, yet, a matter of common sense. Each case is different and presents diverse needs. As a consequence, no absolute conclusions can be reached, everything related to anastylosis implementation becomes relevant and, therefore, firm sets of rules cannot apply. However, although practitioners question the advisability and usefulness of the issue, they seem to argue the lack of information in practice, as it happens in the Parthenon and the Propylon.

Additionally, absence of the issue in the conservation charters, especially the *Venice Charter*, may indicate its insignificance, according to a restorer working in the Athenian Acropolis. Nevertheless, as Marconi sustains (1993, 138-150) the charters form the theoretical background and never provided technical details on purpose. Nonetheless, lack of percentages or defined limits in conservation charters, in my opinion, is a disadvantage because it may be projected as justification for the use of excessive amounts of new material to complete the form of the monument and stabilise its structure. Additionally, from my study of the monuments subjected to anastylosis, lack of information on the quantity of surviving material prevented a thorough understanding of the intervention.

Overall, certain professionals in the survey seem to consent to accepted limits in anastylosis. This is a conclusion I also reached since minimum interventions are the cornerstone of current restoration theories and because authenticity of the form and design of monuments is easily affected. Once again, it becomes apparent that theoretical principles should be followed by practical guidance. Establishing limits, even if flexible, in anastylosis will not allow unrestricted use of new material, even though, as highlighted in the Erechtheion, practitioners should be realistic about the quantity of new material that may be required.

Those who agree with establishing accepted amounts of available material emphasise that dispersed original material should be assessed according to volume, surface, weight, entirety of members, mass (professional survey), sheer amount (Propylon), and location (Lindos Stoa). In a few instances, plenty of material survives from specific parts of a monument, while other elements are missing (Propylon, Trajaneum, Celsus Library). Sometimes, enough material survives in a poor state, complicating decisions on its use (see Dimacopoulos in CCEM 1988a, 18). This is noted in the Parthenon, where the restorer distinguishes between quantity and percentage of original material. From the case studies and the professional survey it is concluded that the state of preservation of original material will determine the quantity of new material to be used. Possibly, a large proportion of original faces or surfaces may be lost or remain unidentified. Deteriorated material may necessitate introduction of more new material than anticipated. This will lead to falsifying the form and integrity of the monument and will affect the structural system, if the connecting points require strengthening. In turn, the extent of intervention will increase. This is why most professionals conclude, and rightly so, that any decision depends on the condition and state of erosion of fragmented members, their amount, structural stability, importance as building elements, on the context, and on the condition of other building elements. For instance, enough original members survive from the Lindos Stoa, but not all of them are re-integrated, because their deterioration requires extensive integrations and completions.

Nevertheless, if an acceptable amount of original material is to be specified, professionals are directed towards 70-80% of surviving elements to justify anastylosis implementation. Only a few experts in the survey suggest lower amounts and only one case study (Propylon) presents low quantity of surviving material. It is also confirmed that the majority of original material should survive in a good state.

The establishment of a named percentage of original material in anastylosis could require a specific percentage of new material to be integrated in architectural members and fragments. If a 100% of new and original material is used in total, then it results in full reconstitution. If anastylosis is partial, then a 100% of material is not required. If full, then, completion of the original material should not be aimed at, just because most original members are present. Accordingly, when 80% of original members survive in a building, it may be possible to establish that another 5-15% of new material is needed to ensure re-assembly of surviving members. Furthermore, in the Avaton, new integrations seem to be assessed with relation to the total extent and volume of the building, as well as the form of the archaeological site. This idea is quite radical, especially since comparison of integrations to the restored monument and, even worse, to the whole site may signify that extensive amounts of new material will be used. Therefore, the argument made with regard to establishing percentages of original and new material is enforced.

Another technical matter that emerged in the exploration of the case studies concerns the re-assembly of members in their original location or randomly. Ideally, re-assembly in original locations should be followed (see Chapter 3). In most cases (Athenian Acropolis, Epidauros) members are assembled in their original positions, if they can be defined. If they cannot be identified with certainty, random assembly is the next choice. The Celsus Library is the only example where members were re-integrated only in their original locations. This becomes an issue because in the past members were unsystematically assembled, so that most material would be reintegrated with fewer completions (Lindos Stoa), creating problems regarding authenticity. It is important, though, to realise that ideal situations hardly exist and, thus, our objective should be the best possible action with the least possible consequences, realising the necessity of compromise and realism.

As monuments subjected to anastylosis are mainly of stone, the new material for completions is natural or artificial stone. Occasionally, both types are used in the same monument. Although professionals appear directed towards the use of natural stone, in practice their decisions vary. The choice is difficult, depending on technical matters, such as the needs of the monument, the type of the original stone, and is influenced by theoretical and financial issues. The main concern is about new stone being compatible with the ancient one. Recent tendencies towards traditional materials, as well as unsuccessful laboratory experimentation (Avaton, Sagalassos Nymphaeum) enforce the choice of natural stone. On the other hand, the choice of artificial stone is reinforced by its considered facilitation of differentiation between old and new material (see professional survey).

A degree of differentiation between new and original material and their harmonious co-existence is proposed by the *Venice Charter*. Clear differentiation results to a disturbing image. Harmonious integration falsifies the monument and presents it in a way that disrespects the authenticity of its image and perplexes viewers as to what is real and what is not. Professionals agree with the prerequisite of the charter and certainly follow this principle, as shown in the case studies. However, they consent that everything depends on the needs and particularities of the monument, as well as on the aims of the anastylosis.

Different methods, either suggested by the charters or developed from extensive practical experience, achieve desirable but unobtrusive differentiation. They are applied individually or in combination. The most prevalent ones are the use of different texture or colour, abstraction of details, and use of a different composition material (different kind of natural stone or artificial stone to contrast the natural) (professional survey). Differentiation methods are established by past experiences and recent trends, as well as by specific ideas of the professionals. The latter is obvious in the Trajaneum and the Celsus Library, where the continuity of form of the monument and the original light shade effect were considered. On the other hand, application of a contemporary stamp is advocated in the *Venice Charter* and has been practiced ever since the first anastylosis applications. It is a valid choice for many case studies and seems to aim at assisting future researchers or restorers to distinguish between original material and material of later interventions. It is related to professional approaches, by documenting the intervention on the monument.

In most case studies the contrasts between new and original members are not intense but some problems emerge. Difficulties in the visual integration of new stones with original ones are experienced, because colour or surface contrasts can be too obvious (Erechtheion, Trajaneum). With time, the difference between new and old material becomes obliterated, as new members acquire a patina of age. Differentiation of colour and texture also questions the way in which the contrast can be alleviated in the present. Possibilities of producing artificial patina are discussed in the Acropolis monuments with professionals being divided as to whether they consider its application acceptable or not.

Besides the above considerations, another problem that is also raised regards the ability to detect the added material long after its integration. Colour and texture differences will fade with weathering and the creation of the patina of age. Therefore, the question of new material being slightly, yet harmoniously, differentiated from the original resurfaces. In this regard, two issues should be taken into account. As a survey participant maintains, weathering does take place as a law of nature whilst all materials have a specific life span. This actually entails that such processes can only be delayed and cannot be reversed or averted. Thus, it should be accepted that it will be indeed be difficult to detect the new material years after its integration. Additionally, the degree of weathering will vary in both original and new materials anyway.

On the other hand, some options followed in anastylosis relate to keeping detailed records of the intervention and marking the assembled new members. Regarding the visitors, some suggestions by the survey respondents (professional survey) concern the use of explanatory labels and of modern technology and multimedia, with the aim of offering clear understanding of what material is added and in which locations. Thus, ways of dealing with this issue can be employed in order to provide more viable, rather than just visual, solutions to this matter.

Consequently, the requirement for differentiation between new and original material is twofold. On the one hand, the aim is the distinction between authentic and non-authentic parts in the short and the long term and truth in presentation. On the other hand, harmonious integration does not create intense contrasts and upset the aesthetic view of the restored monument. This is why options should be assessed and decided upon after careful examination and by considering the possibility of employing more than one method.

The joining of integrated members and the preservation of the original structural system are technical matters that require further attention. The issue is interrelated with the type of structures in which anastylosis can be applied, as well as with the principle developed through the Greek experience of anastylosis and as a result of damaging past approaches. This matter is also given special attention particularly because the Mediterranean region is found in an earthquake zone, thus, engineering solutions care for the structural behaviour of the building during seismic activities.

In this regard, the autonomy of architectural elements and their static function are preserved. By following the structural system, the monument will be self-protected and its static sufficiency will be preserved due to the weight of individual elements. Unsuccessful past examples altered the static system of the structures, integrating strong connections. For instance, the previous anastylosis of the Lindos Stoa changed the ancient construction system, leading to destruction of structural material. Additionally, such a principle contributes to preserving the authenticity of the design of the monument and to respecting the original material by avoiding, as much as possible, the future infliction of damages to it. Acknowledging the values attributed to the structural scheme is a principal point of emphasis by professionals in the survey and the case studies, together with the idea that altering the structural system is quite an interventive approach that results in reconstruction rather than anastylosis.

However, the earliest example offered by the Library of Celsus shows the use of past systems of reinforcing the construction. This is justifiable, because at that time it was difficult to test the future behaviour of materials and the results of the employed methods, while new technologies and materials were considered as an advantage in anastylosis applications. The issue has recently re-emerged. This is why in the Erechtheion and the Parthenon, the ancient and past connecting points are used. In other cases (Avaton, Propylon, Sagalassos Nymphaeum) the connections between new and original members are not extremely powerful because it is preferred that, in the case of mechanical forces, the connections, rather than the original members, would break. However, professionals admit that this may be unattainable in practice.

Employed ways of connecting members focus on material similar to the original joints. In most cases white cement and hidden ties made of titanium rods are used (Erechtheion, Parthenon). Many other materials are employed and preferences are equally varied. However, the laboratory-tested efficiency of the connecting material is the principal requirement, as emphasised by professionals in the survey. This indicates the acceptance of technological advances and their contribution to producing compatible integrations that will not have adverse effects on the original material and will achieve the best possible results.

The use of traditional and modern tools and techniques is often encountered in anastylosis projects and the professionals have made interesting remarks in the survey. The main thing to note is the interrelation of the use of traditional tools and techniques with achieving authenticity in workmanship, one of the latest tendencies of the restoration theories and practices. In this regard, I agree with an expert stating that in anastylosis of ancient monuments the intent centres on preserving structures rather than techniques. Authenticity in workmanship is not a priority, yet, it is accepted if it occurs. This is why professionals do not indicate any preference towards ancient or modern tools and techniques and they may use both, as proved in the case studies. Selection of tools and techniques is made according to their availability and feasibility, the advantages found in each case, the aims sought to be achieved, and the specific needs of each case.

Technical studies are directly linked to employing modern or traditional techniques and are an important aspect of anastylosis works, as highlighted in all case studies. Studies and laboratory experiments are undertaken in order to decide upon compatible materials for re-integrations and connections and test their future behaviour. Such technical studies produce results regarding the use of natural or artificial stone, the type and composition of artificial stone, the production of cement mortars for copies of members, the use of titanium as connecting material, and a variety of conservation and stabilisation matters for deteriorated members. Thus, the technical issues raised in anastylosis can be dealt with collaboration of science and technology. This is in accordance with the *Venice Charter* (Article 10), though the charter underlines the importance of ensuring the compatibility of new material and of employing materials and techniques that do not have adverse effects on the building and its fabric. Previously, the *Athens Charter* approved modern technologies, which eventually led to harmful interventions. This is why caution should be exercised when employing modern technology, which should assess the possibility of using the wrong material. However, the recent technological advances have exactly this advantage; they are competent in testing the efficacy and future behaviour of materials, so that their introduction into the monument will not have severe consequences.

Computer technology has become an example of the technological advances that contribute to planning and implementing anastylosis. It forms a competent way of advancing the practice in an effective manner. There are not many examples of its use in the case studies, yet, when employed it results not only in facilitation of works but also on improved approaches. For instance, in the Lindos Stoa and the Sagalassos Nymphaeum extensive testing of structural members was carried out in order to decide which members and fragments belong together. This aspect of the work is quite strenuous but contributes to making the right decisions and assembling members to their correct locations. Contrastingly, computer programs employed in the Erechtheion and the Parthenon identified correct locations of members and facilitated the entire process.

The emergence of virtual technology, as shown through the 3D MURALE project (Sagalassos Nymphaeum), provides methods with exhaustive potential for the reintegration of members and fragments. The idea focuses on producing virtual structural elements, as accurate representations of surviving ones, and easily testing them in a virtual interface. Thus, virtual representations can simulate and test anastylosis plans. Even though they still form research programs, it is only a matter of time before they become widely available. They could form one direction towards which anastylosis professionals could orientate. They also prove the importance of multidisciplinary approaches that engage information technology and their effectiveness in planning and implementing anastylosis. At the same time, virtual multimedia has excellent applications in matters of interpretation. Given that anastylosis is partly employed for reasons of interpretation, it would be expected to rely on such technologies to achieve interpretation and, possibly, reduce extensive interventions.

7.6 What are the issues related to decision-making, planning, implementation, and post-implementation of anastylosis?

Anastylosis should be planned and implemented as part of a wider management plan for the site in which the monument is found. It is an intervention strategy which cannot be successful if not undertaken with diverse aspects in mind. However, although in most cases it is quite obvious that such a plan exists and covers these issues, in practice there are no references to it. I did not find any relevant information in my examination and study of the monuments in question. This is interesting because some monuments are found in enormous archaeological sites, some of which are even inscribed in the World Heritage List (Athenian Acropolis, Epidauros). This entails that conservation and management have definitely been decided and outlined according to a plan. Thus, management plans are produced and followed, yet, they are not widely publicised. Accordingly, providing information to those interested and subjecting plans and proposals to constructive criticism by relevant professionals and bodies should be identified as a necessity when caring for and restoring heritage.

Even if the existence of a management plan is accepted, it does not mean that it covers all problematic matters or that is strictly followed. If planned management does not exist as a concept, then its importance becomes clearer with time. An indicative example is presented by the archaeological site of Ephesus about which concerns have been raised about its visitor management in particular. In other cases, such as the Lindos Acropolis in Rhodes or the site of Epidauros, although restoration/anastylosis for other monuments of the site are planned and implemented, there are, so far, no provisions for visitors and for the future maintenance of the monument, and there is no consideration of the future of the archaeological site, such as the final form of the restored monuments and their setting. What is certainly not found anywhere or in any management planning is the assessment of the significance and the values attributed to the individual monument and the site. This becomes exceptionally peculiar, especially in an era in which the international theoretical framework pays close attention to values for reaching well-informed decisions in conservation and management.

Characteristic in this regard is the matter emerging in some case studies, where members of the monument in question are found in second usage in other structures (see Avaton). The members in second usage are not usually returned to their original location for reasons of respect of the later history of the second monument. Yet, the restored monument should be respected in terms of its surviving material and its authenticity. Consequently, a conflict of values surfaces and the only way to make a decision with the absolute respect to the monument and its fabric would be to assess the values of both monuments, so that an acceptable compromise could be reached.

The management plan, including the anastylosis proposal, occasionally seems to be altered and revised as time goes by, instead of having a definite form. The essence of a plan is to be able to predict and tackle all possible emerging issues in the conservation and management of an archaeological site. Having a concrete form that does not need to be modified is crucial, as changes might occur one after the other and then focus about the right course of action is lost. From another point of view, though, it is also fundamental that a management plan or an anastylosis proposal remains flexible to new discoveries. Thus, it should regularly be subject to reviewing so as to reflect the potential changing needs of the monument and the site or the further development of heritage management and conservation theories.

Concerning anastylosis proposals, indicative examples are presented by the Epidauros monuments and the Lindos Stoa, where renewed anastylosis proposals were produced after further architectural members belonging to these monuments were discovered. Although the protection of structural elements necessitated conservation and anastylosis, the possibility of excavating further members that could be re-assembled was perhaps not examined. Their recovery from the site occurred accidentally. Yet, if the anastylosis had delayed in order to exhaust such possibilities, some elements would have deteriorated and become inappropriate for re-assembly. The subsequent question involves the establishment of when excavation should stop and conservation and presentation of a monument should initiate. In large sites, there are great possibilities of recovering members belonging to ruined monuments, even after restoration or anastylosis are complete. Hence, there should be more clearly-phrased planning of alternative solutions if a new discovery would alter the decided and implemented anastylosis.

The choice for anastylosis of a specific monument in a large site comes across during the examination of the case studies. For the Erechtheion the choice was based, apart from its immediate need for intervention, on being a convenient choice to acquire further experience to restore other monuments of the Acropolis. Selection of the Sagalassos Nymphaeum concentrated on the fact that it was identified with certainty. Accordingly, anastylosis should essentially be planned with a general overview of the site and its monuments in mind.

Another issue that should be addressed is the duration of the works. In the Acropolis of Athens and in Epidauros the anastylosis projects are not completed along the specified deadline. A variety of reasons may be responsible for that and a plan should provide for such instances.

A management plan also provides for organisation of the work-site, arranging it with issues of aesthetics and visitor accessibility in mind and taking into account criteria such as time, space, economy, less obstruction, safety for visitors and personnel. In some cases, it forms parts of the anastylosis study, while guidelines for its organisation are even produced (Parthenon). Such provisions are of great importance, especially when the anastylosis projects last for a long time.

Maintenance works are also an important aspect of management, being also strongly advocated in the *Venice Charter* (Article 4). Even if anastylosis is successfully completed, caring for the restored monument in the years to come will produce better results in the long-term. Such examples are provided by the Erechtheion and the Sagalassos Nymphaeum, in which future programmes, directed mainly towards conservation of surfaces due to atmospheric pollution and weather conditions, are planned. The aim of planned maintenance becomes the prevention of further deterioration. Remarkably, not many case studies present such examples.

	This will lead to conclusions on estimating how much new material will be needed for re-assembling the original, since the condition of building elements may be variable. Decisions on what should be done if the quality of preservation is poor should be made in accordance to considerations about structural and technical issues and related educational ones (7.5). *Decisions will also need to take into account the fact that original material may survive only from specific parts, which, in turn, will require partial anastylosis. What should be avoided is full completion of the form of the monument and assessment of completions with relation to the total extent and volume of the building and the site (7.5).* *A significant aspect is the relation of anastylosis with the understanding of the archaeology, architecture, and construction of the monument, as well as with diverse fields (archaeology, architecture, structural engineering and conservation) (7.2).*
6. Decisions depending on the <u>combination and compromise</u> of the above.	*Anastylosis should be guided by modest approaches and the possibility of finding middle-road solutions.* *It should be decided and implemented by: applying theory to practice; understanding the relativity and generality of theoretical concepts; respecting the monument and its significance; understanding the particularities of each case; and exploring and evaluating all options.* *Anastylosis interventions should be viewed within the framework of minimum possible violation of rules for best possible results and balance among the greatest benefits and minimum losses. Restorers and heritage professionals should realise that some monuments will never be preserved and presented that well if left un-restored and if their members are simply subjected to conservation and stabilisation treatments.*

II. PLANNING OF ANASTYLOSIS

A. Management planning and anastylosis

Subsequent steps to be followed:

1. Assessment of the values of the monument and the site.	*The necessity of systematically assessing and analysing the values and significance of the monument and its setting before proceeding with the intervention should become the starting point (I.A, I.B.3).*
2. Identification of stakeholders and the public; their inclusion in the process of value-assessment and decision- making, through visitor surveys and social studies, and provision of information.	*Public consultation and provision of information is a problematic issue which certainly needs to be resolved. Anastylosis is addressed to the public, as it aims at improving the legibility of the ruined monument. Thus, the public should not be left out when deciding on anastylosis and when evaluating its results, as people may value different things compared to the experts (7.2, 7.6).* *Social and visitor studies are essential for getting reliable data regarding the opinions of visitors and the public. The extent to which this information would be considered in decision-making forms a matter of assessing and compromising the different views of professionals and the public (7.2, 7.6).*
3. Planning should take into account the presentation and interpretation of the monument and the site, and provide information on the undertaken works.	*In some case studies complete reliance on the restored form of the monument for achieving education for the public is noted. In other cases, the potential of interpretation of the site in which the monument is found is ignored (7.2).* *Interpretation and education should be achieved, not through extensive interventions, but through a combination of interpretative methods. The public should not be underestimated in terms of their understanding and appreciation of ancient architecture and archaeology. Motivation of their imagination can accomplish the same objectives (7.2).*

<u>Explanatory material</u>, selected by educators and interpretation professionals, should be present near the monument and should be employed in direct relation to the extent of the intervention.	*Lectures, photographic exhibitions, education material, and even digitised information can cover aspects of dissemination of information and of advancing interpretation. Interpretative material can be widely varied, such as models, drawings, videos, diagrams, and signs within the site. Information, including aspects of the history and archaeology of the monument, namely its different phases and function, its existence within the site, and its anastylosis, should be provided. It should not be limited to notice boards with views and plans and printed material. Advanced technology, through multimedia and virtual representations, has excellent results. The use of experimental archaeology, in ways similar to how it is employed in heritage education, could aid understanding by the public and the experts, by introducing them to aspects of ancient architecture and building construction. Explanatory and interpretative material in the site can be employed during and after the works. Collaboration of heritage educators and interpretators is fundamental. Education, in terms of experimentation and research, for professionals should also not be dismissed (7.4, 7.5, 7.6).*
4. Actions for <u>monitoring</u> the monument and its future <u>maintenance</u>.	*Their importance is found in preventing further deterioration of surfaces or material from occurring, especially in areas where atmospheric pollution or weather conditions inflict damages to the fabric (7.6).*
5. <u>Circulation of visitors</u> during works should be carefully planned, aiming at minimum disturbance of their experience and safety of visitors and workers.	*Visitors should be allowed to visit or, even, enter a monument subjected to anastylosis. Issues of future deterioration due to visitor wear may impede such a decision. Thus, it should be planned in such a way that visitors will be allowed to experience the monument by entering its space without causing further deterioration to it (7.2, 7.6).*
<u>Tourism and visitor management</u> should also be planned.	*Other aspects regard the approach to the ancient site; such was the aim at restoring the ancient paths of the Acropolis of Athens. These can all be*

encapsulated in a tourist and visitor management plan that will ensure the benefit of the public from the restored monument, as well as protection of the heritage resource (7.2, 7.6).

Decisions should be judiciously taken but reviewed during and after the course of the works, according to the needs of the monument and the site (7.2, 7.6).

6. Planning and installation of the work-site should be subjected to extensive research.

Organisation of the work-site should care for aesthetics, visitor accessibility, safety of visitors and personnel. It should take into account criteria such as time, space, finances, obstruction, and so on. In some instances specific guidelines have been formulated, making that a provision of particular importance for the conduct of anastylosis works, especially long-term ones (7.2, 7.6).

7. In long-term anastylosis projects, planning should be designed in numerous stages.

Planning should not diminish the values of the monument and the site while works are in progress. The variety of issues that may delay the planned works should be addressed so that the project finishes in a reasonable time-frame (7.2, 7.6).

8. Planning of anastylosis in monuments found in extensive sites is important.

If the site is extended in terms of dimensions, the aim should be the establishment of when the excavation and relevant research stop and when preservation begins. Compromise between conservation and stabilisation of elements and implementation of anastylosis should be reached, in case further members are found. It is essential to define which parts of the site should be excavated, researched, and restored rather than conducting research and anastylosis in randomly chosen areas (7.2, 7.6).

9. Safety plans during works should be decided by experts with relevant experience.

10. Planning and provisions for the setting should be based on <u>respect for the traditional setting and its integrity</u>.

Principal matter is the preservation of the traditional setting. A general view of the site is important for establishing which monuments will be restored or subjected to anastylosis, to what extent and with what priority (most significant structures, those from where most original material survives, those which urgently need conservation and anastylosis). Main monuments, secondary edifices, and the way in which the site was approached in antiquity could be restored (7.2, 7.6).

Thus, the site is preserved and presented as a whole and the restored monument does not have a negative impact and does not reduce the importance of other structures. The monument in question should adjust perfectly within the site, while the location and relation of existing monuments are indicated and not altered. (7.2, 7.6).

11. <u>Reviewing</u> management plans and anastylosis proposals.

Alteration and revision of anastylosis proposals (for instance if further elements of the monument are discovered during the course of works) and management plans are a serious issue. They should remain flexible, but also need to predict possible problematic issues, while including clearly-phrased planning of alternative solutions and actions. They should be subject to regular reviewing so as to reflect potential changing needs expressed by the monument and the site and to convey the development of heritage management and restoration theories (7.6).

B. Theoretical principles of anastylosis

1. Anastylosis should be <u>a matter of conservation</u> and <u>less interventive approaches</u>. It should be well thought-out with regard to its <u>interpretative effects</u>.

This issue has been extensively discussed above (I.A, I.B.1, II.A.3).

2. <u>Minimum intervention</u> should be a fundamental principle.	*What is needed for successful anastylosis practices is that minimum intervention theories are clearly articulated and not consist just a general guiding principle, especially since their generality and relativity in theory do not limit quite extensive interventions in practice. Realism should be exercised, as the objectives which anastylosis aims at and the problems that emerge during the course of works may require further interventive actions. Reconstruction work, occasionally involved in anastylosis, should be avoided (7.5).*
3. Principal aim of anastylosis should be its definition: <u>re-assembly of existing parts of the monument</u>.	*See anastylosis definition (8.1)*
4. Respect should be shown towards the <u>form, morphological identity, and architectural unity</u> of the monument.	
5. The <u>effect of completeness</u> should never be achieved.	*This stems from the discussion on artificial/modern ruins (7.5)*
6. Respect should be shown towards <u>original elements</u> by avoiding intervention on them.	*Respect for original material derives from the theoretical framework but, multiple problematic matters surface during the practice. A series of actions should be undertaken, such as the accomplishment of thorough research to acquire extensive knowledge of the monument and avoid conjecture in its restitution; careful handling of original elements and avoidance of any new work on them; introduction of minimum amount of additions that respect all structural parts and are compatible with surviving material; use of ancient or past connecting points and respect for the ancient construction; and preservation of all historical phases of the monument. The issue becomes even more difficult in monuments previously*

	restored, in which case gravity should be placed on members most affected (7.5)
7. <u>Respect towards structural members</u> should ensure their autonomy and static function and preserve the original structural system.	*The structures on which anastylosis can be applied are characterised by autonomy of building elements, which should be respected and not altered (7.2, 7.5).*
8. Compromise should be made between <u>structural stability</u>, <u>enhancement of values</u>, and achievement of <u>interpretation and education</u> for the public.	*This has been extensively discussed above (I.A, I.B.6).*
9. The <u>reversibility of the intervention</u> should guide the works. Prerequisites are: • not extensive interventions; • good preservation state of members; • documentation of interventions; • following the ancient structural system; • compatible new materials; • retreatability of original members.	*Reversibility is a valid concept in anastylosis, even if somehow relative and, therefore, unattainable to some extent. Being strongly related to the features of the specific ancient architecture with individual structural elements, its value is found in enabling the future dismantling of the monument and its consequent re-assembly with more original material, without damages being inflicted either on the fabric or the structural system (7.5)* *It should be complemented by the concepts of retreatability of surfaces and material and of compatibility of materials used for treatments, re-integrations, completions, and connections (7.5).* *The concept could be broken down to reversibility of the entire structure and of individual restored blocks. As such, it becomes easier to define the notion and secure reversible actions (7.5).* *Detailed recording of the undertaken actions, modern technology, technical experience, and minimum interventions will contribute too. Minimum interventions should be given particular attention, since reversibility may be*

projected to justify extensive interventions (7.5).

Standards – kind of damages occurring to the fabric and structure, and amount and type of further discovered original material – that would justify reversal of the undertaken actions should also be established (7.5).

10. The concept of <u>authenticity</u> should remain flexible.

The starting point should be the understanding that it is an abstract and relative concept, respected by avoiding extensive interventions (7.5).

It should be respected in terms of:

- original structural system;
- architectural members;
- original material and form;
- integrated new material;
- workmanship and building techniques;
- aesthetics.

From its established clusters some are more emphasised in anastylosis than others, i.e. its spiritual and functional connotations. Specifically, for achieving authenticity in form and design, the original positions of structural members should be researched, the historical phases of the monument preserved, the original structural system and the way and form in which the structure has survived over time should be respected. Respect for authenticity of materials and substance should be shown by using compatible new material, mainly natural stone, similar to the original, by re-integrating all available surviving material, by introducing limited new material, by conserving and applying protective measures to original members, and, generally, by every means of respecting the original fabric. Authenticity of techniques is not intensely followed, though efforts should be made for employing well-trained stonemasons to work on the marble using, if possible, ancient and traditional tools. Authenticity of the location of the monument is underlined and should be respected through various actions to the traditional setting (7.5).

During anastylosis, a clash is noted between authenticity of material and authenticity of form. Thus, the concept should be thoroughly contemplated and the understanding that by striving for one aspect of authenticity another one may be lost should be clearly articulated (7.5).

11. Respect should be shown for all historical phases, including recent ones.	*Respect for valid contributions of all periods has wider applications in monuments previously subjected to anastylosis, as later interventions are regarded as historical phases too (7.2, 7.5).*
The period to be represented should be decided after evaluation of the available information and the surviving material.	*The principle should be respected in a multilateral way, rather than in perceiving the monument as if it belonged to a specific historical period. Problems may emerge when a decision has to be made about which historic period should be represented. The choice becomes easier if more material from one phase, rather than others, survives. If not, the significance and values of the different phases of the monument should be assessed (7.2, 7.5).*
12. Aesthetics should be emphasised and be assessed by all stakeholders.	*Aesthetics are connected with the conduct of anastylosis and the assessment of its final result, especially with regard to authenticity and to judging the enhancement of the aesthetic values of the monument and the creation of artificial/modern ruins (7.2, 7.5).*
	This study concludes in the stipulation that the aesthetic results of anastylosis should be questioned, since in this way certain aspects can be improved. On the other hand, it is fundamental to understand that the only way of avoiding the creation of artificial or modern ruins, whose own aesthetic qualities become different than those of the original monument, is to leave the ruin as found. As this contradicts the anastylosis objectives, compromise and realism are essential (7.2, 7.5).
C. The extent of anastylosis	
The best decision is to adopt a modest approach.	*The extent of anastylosis is affected by the educational potential inherent in the intervention itself, the amount of surviving material and its state of preservation, as well as on the needs of the monument for structural stability. Thus, it is determined by both theoretical and technical aspects (7.5).*

The extent of anastylosis can be varied in different parts of the monument and it should be <u>established</u> according to: • aims sought to be achieved; • values attributed to the monument; • structural stability of the building; • availability of original material.	*If limits are defined for extensive anastylosis interventions, then they should be clearly articulated as limited possible interventions with the amount of qualitatively well-preserved original material being the determinative factor (7.5).* *Education can be achieved by other means too or by combination of anastylosis and interpretative material, while structural stability and re-assembly of surviving material can only be accomplished with anastylosis (7.5).*
<u>Original material</u> should survive in amounts of at least 70-80% of the entire monument.	*The majority of the original material should be preserved, its qualitative and quantitative preservation should be assessed, and relevant information should be documented. Frequently, the introduced new material is extensive, resulting in increasing the extent of intervention (7.5).*
<u>New material</u> to be integrated should ensure the structural stability of the monument and its members and should not complete in 100% the original material.	*The defined minimum amount of surviving original material that would justify anastylosis and an accepted percentage of new material, to be introduced either as completions or connecting material, are suggested here, according to the study of the monuments of this thesis and the opinions of anastylosis experts. Any number suggested cannot be strictly followed, because certain monuments present certain needs. Thus, the individuality of each case and the variable needs of each monument should always be taken into consideration and the established amounts should be viewed with certain flexibility (7.5).* *Establishment of such a number simply attempts to put limits to the extent of intervention and not to allow unrestricted use of new material. The aim becomes the formation of standards against which anastylosis works can be measured (7.5).*

D. Anastylosis interventions should be implemented with collaboration of various disciplines through multidisciplinary and interdisciplinary approaches.

1. Multidisciplinary approaches can be achieved with collaboration of a wide range of disciplines, which should be involved according to the needs of the monument.	*The collaboration of disciplines produces essential and significant results in terms of research undertaken before deciding and during the planning of anastylosis. Before deciding on which disciplines can be involved, the needs of the monument and the site should be assessed. Heritage and site managers who will co-ordinate all variable aspects of the project should be present. Social scientists, education specialists, and other heritage experts should deal with issues regarding public consultation, their involvement in anastylosis decision-making, and their provision of information. (7.2, 7.6).*
2. Interdisciplinary approaches can be achieved by training and understanding of the disciplines involved. Disciplines should link the results of their answers.	*Regarding the training and education of restorers, courses should be available so that restorers involved in anastylosis are trained on its implementation. Different understandings and interpretations perceived by diverse disciplines creates problems. Therefore, they should be informed of each discipline that collaborates in anastylosis and presented with ways and methods with which this collaboration can be harmonious (7.6).*
3. Collaborations and discussion should be instigated among professionals with diverse expertise.	*This is extensively discussed in the Greek case studies with regard to the conduct of international conferences in which professionals from various fields participate and discuss the proposed anastylosis (Chapter 4)*
4. The anastylosis study should be available to experts for constructive criticism and exchange of opinions, before any action takes place.	*This is extensively discussed in the Greek case studies (Chapter 4) and in the discussion about the availability and accessibility of anastylosis plans and proposals (7.6).*

E. Research before intervention

Thorough research should be undertaken before the planning and implementation of anastylosis. Specifically:

Research undertaken will be archaeological, architectural, and structural engineering. Variable scientific investigations on the building and its fabric depend on its needs. Research on archival information and previous interventions is crucial, especially for monuments excavated and restored in the past (7.2, 7.6).

1.1 Archaeological research.

1.2 Architectural and topographical research.

1.3 Structural study of original components.

1.4 Surveys of the ruins, their components, and the setting in which found.

1.5 Building information.

1.6 Planning with graphic restorations.

1.7 Technical studies.

The significance of technical studies is emphasised, as they facilitate the conduct of works, provide the possibility of conducting laboratory experiments and analyses to decide upon compatible and durable new materials and of deciding upon a variety of conservation and stabilisation treatments for deteriorated elements. However, caution should be exercised when employing modern technology. The risk of using wrong materials should always be considered, even though this is exactly where the advantages of the latest technological advances are found (7.5).

The significance of such research, together with multidisciplinary and interdisciplinary approaches and the instigation of applied research for technologies necessary in anastylosis, is reflected on the acquisition of thorough and exhaustive knowledge of the monument that will contribute to well-informed anastylosis plans (7.6).

F. Recording and documentation	
Exhaustive documentation should precede and follow any intervention.	*Recording of the monument and documentation of the anastylosis should include all stages of the intervention: prior, during, after. It should be as accurate and as detailed as possible, because lack of or incorrect documentation has impeded anastylosis works and further research (7.6).*
Recording should be accurate and comprise of: • information on architectural and structural features and details, • conservation matters, • and bibliographical and archival research.	*Recording may include photographs and drawings, information on new and original material, archaeological and architectural information, archival research, information on past interventions and alterations and on the planning and implementation of the anastylosis, assessment of the final result with reference to problematic situations (to provide insight on how these emerged and were resolved), articulation of the reasons and aims of anastylosis, equal gravity to theoretical and technical aspects of the works (7.6).* *Such documentation should be prepared before initiation of works, so that possible mistakes or misunderstandings in interpretation or in the proposed works can be scrutinised and evaluated by relevant professionals in time. Possible diversions from the initial plan should be noted in the records and publications that follow (7.6).* *Documentation and publication of the undertaken research and the implemented project should be widely available to those interested. This action improves dissemination of information, while it subjects plans and proposals to constructive criticism and ensures transparency of the undertaken works. Information can be produced in two different levels: specialised (for professionals) and general (for the public) (7.6).* *Existence of such information in publicly available archives is an essential step, while language accessibility, through translations or publications in many languages, would also advance accessibility matters (7.6).*

III. IMPLEMENTATION OF ANASTYLOSIS

A. Anastylosis in relation to other types of treatments.

1. Other types of intervention or non-intervention may be employed during the course of anastylosis.

A broad range of other types of intervention or non-intervention may be employed. Specifically, some members of particular importance may be removed to the museum; non-valuable material may also be removed and stored; members not re-assembled may be displayed or stored near the monument; and members found in second usage may be removed from that structure to be re-integrated to their original location (7.2, 7.6).

2. Other interventions may include: conservation and stabilisation treatments.

Conservation and stabilisation treatments will be applied to elements deteriorated due to natural phenomena, atmospheric pollution, and visitor wear, and in order to ensure their static stability and future protection (7.2).

3. Reconstruction should be avoided.

Reconstruction with limited surviving material or with no original material should be avoided if preservation of authenticity and minimum intervention are guiding principles (7.2).

B. Implementation of anastylosis

1. Historical phases or important artistic and architectural parts

Ideally, all historical phases should be preserved.

Respect for valid contributions of all periods is another theoretical principle followed in practice. It has wider applications in monuments previously subjected to anastylosis, as later interventions are regarded historical phases too. In general, the principle should be respected in a multilateral way, rather than in perceiving the monument as if it belonged to a specific historical period (7.5).

If a selection should be made, then it should be made in accordance to:

Problems may emerge when a decision has to be made about which historic period should be represented. The choice becomes easier if more material from one phase, rather than others, survives. If not, the significance of the phase influences the decision. Thus, the

- the values of the monument;
- the state of preservation of each phase;
- the amount of archaeological and architectural information.

way in which it should be dealt with would be to assess the significance and values of the monument and reach a conclusion (7.5).

If parts are removed, this should occur with exhaustive documentation.

Sometimes, decisions are taken to remove members of the monument to the museum for reasons of protection. This decision should be taken after all options are explored (for example, if atmospheric pollution is damaging the material there may not be significant improvements, despite measures being taken). The additional argument would be the respect for and safeguarding of the original material. The members should be removed somewhere close to the monument, so that they will not be entirely deprived of their original context. The next step would be the decision about whether they should be replaced by copies. If they are indeed replaced, then issues of authenticity, aesthetics, and education should be contemplated. Consultation of experts and the public would provide ideas and result in well-informed decisions (7.5).

2. *Original stones*

Actions to be undertaken are:

- laboratory tests and experiments;
- exploration of deterioration of badly preserved members;
- subsequent conservation or stabilisation.

This issue has been extensively discussed in the case studies (chapters 4 and 5), as well as in chapter 7 (7.2, 7.5).

3. *Use of eroded fragments and weathered members*

Assessment of their qualitative and quantitative state of preservation should be undertaken.

4. Choice of material for additions and completions.

The material for additions and completions will be either natural or artificial stone. Decisions should be made with regard to its compatibility, durability and harmonious integration; aesthetics; respect towards original material; trained stonemasons and collaborations with geological/stone centres; and financial aspects.

The type of new material forms a difficult choice, depending on technical matters and influenced by theoretical issues and financial resources (7.5).

Concerning integrations and connecting materials, suggestions are made in Appendix H (III.B.4).

Requirements are extensive laboratory experimentation for ensuring their compatibility with the original material and the testing its future behaviour and durability (7.5).

5. Differentiation and harmonious integration of new and original material

Choices are widely varied:

- application of contemporary stamp or mark;
- use of different texture, colour, material;
- abstraction of details;
- new members placed slightly inwards.

Further options can be explored.

Issues to be considered are:

- the respect for the signs of ageing of original members,
- the good quality of workmanship,
- the continuity of the form of the monument, and

The Venice Charter has underlined the importance of differentiation and harmonious co-existence of new and original material. In Appendix H (III.B.5), the currently employed methods are outlined.

Most importantly, methods need to be established according to the needs and particularities of the monument in question. They can be applied individually or in combination for attaining distinction of members for the benefit of both the public and the experts, as well as for reaching the best possible results and documenting the intervention itself. The guiding line should be the distinction between original and non-original parts and the truth in the presentation of the monument, together with the avoidance of creating intense contrasts and overthrowing the aesthetic view of the structure (7.5).

Options should be explored and decided

- the ability to detect original and non-original members in the long term.

upon careful examination and even consideration of combining methods. Particular attention should be paid to the colour and surface contrasts between new and original members and the advantages and disadvantages of the creation of artificial patina (7.5).

In addition, gravity should be placed on the long-term differentiation of new and original members. Detailed records of the additions and permanent marking of new members and fragments will ensure their future detection while explanatory labels and, if possible, the use of modern technology and multimedia will offer the desired distinction for the public in the years to come (7.5).

6. Structural system

The values of the structural system should be respected, by following the original construction, when possible.

Respect should also be shown on the static function of members and the general structural design, as this forms a prerequisite for respecting the authenticity of form, design, and material (7.2, 7.5).

In *previously restored monuments*, in which the original structural system has changed, efforts should be directed towards reinstating the static system of the building.

Steps to be taken relate to geological, engineering, and structural studies. Problems to consider regard the bad preservation state of structural blocks, partial anastylosis having to follow a different system, and financial problems.

Matters that need to be attended are the fact that these monuments are normally found in earthquake zones, thus, the connections should not be so powerful, because if mechanical forces occur, the connections, rather than the original members, should break (7.2, 7.5).

7. Connecting material and joining of elements

To decide on the connecting material archaeometric and metallurgical studies,

Joining material should be similar to the original, in terms of features and attributes, while past connecting points as well as laboratory tests should be undertaken.

should be utilised, instead of creating new ones. Compatibility, durability, and future behaviour of connecting materials should be laboratory-tested before decision on their use (7.5).

The joining of fragmented material and members should be executed by testing and checking the connections of the structural blocks and the joining points and by introducing minimum possible connection points and joining material.

8. Traditional and new methods and tools

Advanced methods and techniques can be employed for shifting and re-assembling members to ensure their safe handling.
Ancient methods and techniques can be employed for sculpting and elaborating stones or juttings; joining blocks; and protecting stone surfaces. They enhance authenticity of workmanship and result in better integration.
The choice of tools should be made in accordance to the aims of the intervention.

Employment of traditional or new methods and tools is interrelated with achieving authenticity in workmanship, though it does not necessarily form a priority in anastylosis. Availability and feasibility of employed tools and techniques, advantages found in each case, aims sought to be achieved, and, the specific needs of each case should be explored and contemplated (7.5).

9. Final re-assembly

Efforts should be made to establish the original location of surviving members, while re-assembly of members in non-original locations should be limited.

The ideal situation would be re-assembly of surviving members in their original locations. Yet, if these are not identified, re-assembly in matching locations could be an option but should be conducted in a careful and systematic manner. It should be done in a way that no intervention is undertaken in original members, no further new material is introduced, and the authenticity of material and form is *respected, to a level at least (7.5).*

Compromise and balance of all factors influencing the re-assembly should be exercised, together with realism about the limitations of anastylosis of ancient monuments (7.5).

10. Anastylosis in previously restored monuments

Important aspects are:

- intervention limited to already restored parts;
- correction of morphological and structural inaccuracies;
- dismantling of restored parts and subsequent conservation;
- research to confirm archaeological and architectural features;
- research on previous conservation interventions;
- care not to alter the already acquired form of the monument.

Monuments previously restored present particularities in anastylosis, compared to ruined or newly excavated ones. They require a slightly different or more flexible approach. Issues that should be emphasised are related to the principle of minimum alteration of the appearance of the monument and the respect for the past restoration as a historic event. Their particularities need to be established, so that their anastylosis can be successful with due respect to their individuality and so that the intervention will not be excessive (7.2).

B. Computer programs and information technology.

Computer programs and information technology can be employed:

- to draw restoration studies;
- for documentation matters;
- for interpretation reasons.

Computer technology has become the next stage in the use of technological advances in anastylosis. Its potential is found in documentation, interpretation, investigating the joining of members and fragments, identifying the correct location of members, and testing anastylosis plans. Efforts should be directed towards advancing this technology and obtaining the financial resources to employ it (7.5).

Multimedia and virtual representations *can become the way forward in limiting extensive interventions. Their applications should deal with the distinction of new and original members (as they would be represented in the virtually reconstructed monument) and the possibility of alternative interpretations (7.5).*

IV. POST-IMPLEMENTATION ASPECTS

A. Availability of documentation

Publications of the monuments, covering their archaeology, architecture, history, and anastylosis, should be available to the professional community.

Documentation of the monument and the anastylosis works should be available and accessible to all those interested.

The creation of anastylosis archives would disseminate information.

Documentation and publication of the undertaken research and the implemented project should be widely available to those interested. This action improves dissemination of information, while it subjects plans and proposals to constructive criticism and ensures transparency of the undertaken works. Information can be produced in two different levels: specialised (for professionals) and general (for the public). Implementation of a specific publication policy could be an efficient method. Existence of such information in publicly available archives is an essential step, while translations or publications in many languages would advance language accessibility (7.6).

B. Assessment of the results of anastylosis

Assessment should be undertaken by professionals and stakeholders and be widely available to those interested.

The success of anastylosis should be measured and evaluated by assessing the accomplishment of the set objectives, aesthetics, the understanding of the monument, the indication or correction of its form and image, the disadvantages of anastylosis, as well as the successful resolution of any problematic matters that may emerge. The advance of anastylosis approaches depends very much on the experience acquired by implementation of such projects and on the exercise of sincere criticism (7.2, 7.6).

Such assessment could be undertaken

	by the professionals involved in the anastylosis projects themselves. Additionally, experts who have worked in similar projects could provide valuable insights of their work as well as offer useful suggestions through their own experiences. These are people qualified to assess an anastylosis project and their diverse expertise (archaeologists, architects, engineers, site managers and heritage consultants) could be applied to specific projects. The views and opinions of the public can also be explored and employed for assessing the results of the specific anastylosis work. *On the other hand, if a project is not completed with absolute success or if certain aspects of it are not considered accurate, further action should be planned, if possible, in order to correct them. If not feasible, then certain lessons can be learned through the process. Besides, the identification of mistakes can improve the planning and implementation of future projects in which similar issues may be raised.*
C. Future maintenance works	
The implementation of maintenance works should begin after assessing the needs of the restored monument and according to the estimated deadline by the professionals.	*Maintenance works should be planned and initiated after completion of the anastylosis and according to judgements about their necessity (7.2, 7.6).*

8.3 Concluding remarks

The practice of anastylosis has evolved due to acquisition of valuable experience through its applications for a long time and even through mistakes that have occurred in the past. The passage of time, the development of heritage management theories and restoration principles, and the advances of modern technology contribute to improved approaches. This is why no guides and methodologies are static and no theoretical frameworks should be followed in a sterile manner. Flexibility of interpreting theoretical principles and adapting technical methods to the individuality of monuments are necessary for efficiently and successfully completing anastylosis. A series of the broad range of issues emerging in anastylosis were highlighted in the discussion and encapsulated in the guidelines. It is my hope that the conclusions of this research will play a role in the future conservation of the built archaeological heritage.

CHAPTER 9: CRITICAL EVALUATION AND CONCLUDING REMARKS

The data collection is critically evaluated, while proposals for further research are made. The significance of this research for anastylosis and the wider field of architectural conservation and heritage management are highlighted.

9.1 Critical evaluation of data collection and proposals for further research

The examination of the context of cultural heritage management provides the background into which the concept and practice of anastylosis is situated. The outline of the issues of anastylosis offers a thorough overview of what are the current debates and the issues raised from the method.

The selected and examined monuments represent architectural and structural types on which anastylosis is confirmed to be applied and are all related given their common cultural context. This is the reason why they form representative examples of the monuments of the Mediterranean region. The rather small number of case studies and the absence of major diversions in the legislative framework permitted thorough examination of the objectives and the theoretical framework of the practice together with the broad range of the technical issues raised in anastylosis.

The professional survey was delineated and conducted in order to extract information through the experience and ideas of anastylosis practitioners and heritage experts. This tool has never been used before in the context of anastylosis and the extracted information aids thorough exploration of the concept and the method.

The professionals who participated in the survey were involved in projects as individuals or as members of restoration or heritage organisations. Such projects took place in Italy, Greece, Cyprus, Turkey, Malta, the Lebanon, Turkey, and Jordan. Professions are as varied as possible. Organisations cover a wide range of universities, archaeological and restoration services, and heritage organisations. They represent various countries and world regions – Europe, America, and the Near East.

Some unsuccessful attempts to contact organisations and individuals could not have necessarily been foreseen. Therefore, the questionnaire was employed to extract information in a more systematic way. Professionals provided positive responses to the survey and information on case studies, publications, and contacts. Interesting conclusions could be drawn regarding the reluctance to partake in the survey, such as the disagreement with the topic and the doubt of its necessity or the importance of its results. For some professionals, this survey showed a weakness to embrace all disciplines involved. The purposeful generality of the questionnaire and its lack of reference to specific examples were decided in order to instigate responses from further disciplines and experts. Opportunities were also provided for completing the given answers with further comments, covering diverse matters appearing in individual monuments. During the conduct of the survey and the analysis of its results, the social and cultural biases in responses, as well as in non-responses, were taken into consideration, therefore no conclusions could be absolute in this regard.

The visitor survey was conducted in a small scale in order to highlight the public view regarding anastylosis and architectural conservation, as well as to emphasise the importance of providing information to them and involving them in the decision-making process and in assessing the final results of anastylosis. Given the proven interpretative aspects of anastylosis and its contribution to educating the people about archaeological and architectural heritage, it is crucial to place gravity on the opinions and of the public and including their ideas in further research.

It is important to note that the research was limited in its attempt to address all these issues by a single methodological approach to the anastylosis of ancient monuments. It was conducted in a relatively small-scale manner so as to identify these issues, to assist and encourage the practitioners in adopting a meticulous, yet individual interventive approach to the specific monuments.

Further research undertaken could include systematic examination of additional case studies from all Mediterranean countries in order to include further aspects of anastylosis and, possibly, establish patterns and compare attitudes. A broader study could embrace examples from other parts of the world too. The professional survey can be extended to explore the views of more professionals and organisations. Additional studies can be undertaken, exploring the technical matters of anastylosis. Philosophical and theoretical issues can be further analysed with an extensive analysis of the evolution of restoration theories through time and their influence on anastylosis. Visitor surveys can be broadly undertaken, with numerous participants and exploring in-depth the identified issues.

Nonetheless, the set aims were accomplished. The research approached the topic in a holistic way, including all possible aspects of anastylosis. It was completed in the best possible way, motivating and advancing further exploration of this widely used and historically significant concept and method and situating it within the context of heritage management and conservation.

9.2 Concluding remarks and significance of the research

This research has explained what is the historical background of anastylosis; what the concept and practice of anastylosis currently entail; why it is important to define principles and standards of the concept and practice of anastylosis; what are the driving forces that dictate anastylosis implementation; what are the problems associated with the application of the method and how they arise; and what are the issues related to decision-making, planning, implementation, and post-implementation of anastylosis.

Accordingly, given the type of monuments anastylosis is applied to, the technical issues and the problems arising with the application of the method, as well as the current restoration and management theories, an appropriate anastylosis methodology has been delineated for the first time. It evolves from the contemporary tendencies in heritage management and conservation and defines the concept and practice of anastylosis (8.1).

This methodological approach (8.2) has the form of concise guidelines accompanied by a relevant commentary. The guidelines follow the process of decision-making, planning, implementation and post-implementation of anastylosis. They cover theoretical and technical aspects, taking into consideration the relativity of notions and how these should be determined and guide anastylosis decisions. They reflect the fact that technological advances and scientific experimentation are constantly evolving, so no absolute suggestions can be made. The process of determining the need for anastylosis is outlined and the principles of anastylosis, in terms of what the aim should be, what should be respected, and what should be avoided, are delineated. The procedure for applying anastylosis is specified according to specific steps: research, recording and documentation, planning, and implementation. The commentary identifies and explicates problematic matters raised from the concept and practice and suggests ways to resolve them. It does not proceed with absolute proposals but rather guides towards the direction which heritage managers and restorers should follow in order to tackle them.

This methodological approach acknowledges the importance of anastylosis as an intervention strategy in the wider field of heritage conservation and management and projects its significance by delineating a theoretical framework with a value-based approach that provides the theoretical justification and extent of anastylosis and that should guide technical decisions and actions. It narrows down types of monuments and technical problems and suggests that decisions should be made on the basis of consideration of a variety of matters and on the individuality of each case. Practitioners are encouraged to adopt a meticulous approach to monuments.

Therefore, with this research, anastylosis becomes a formalised intervention method, being attributed its importance in archaeological conservation and acquiring a lucid definition on what it encompasses and a delineated strategy on how it should be implemented within the overall theoretical and technical framework of the preservation and presentation of our archaeological monuments.

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Conservation of Classical Monuments: A Study of Anastylosis with Case Studies from Greece and Turkey

Volume 2

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A thesis submitted to the University of London
for the degree of Doctor of Philosophy

by

Kalliopi Vacharopoulou

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Institute of Archaeology

University College London

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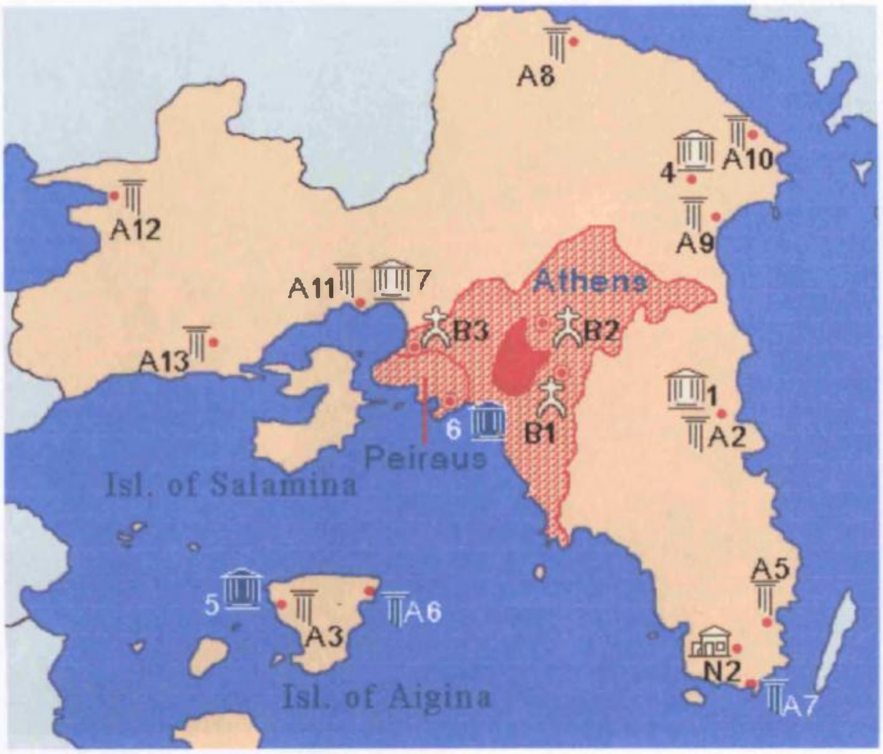

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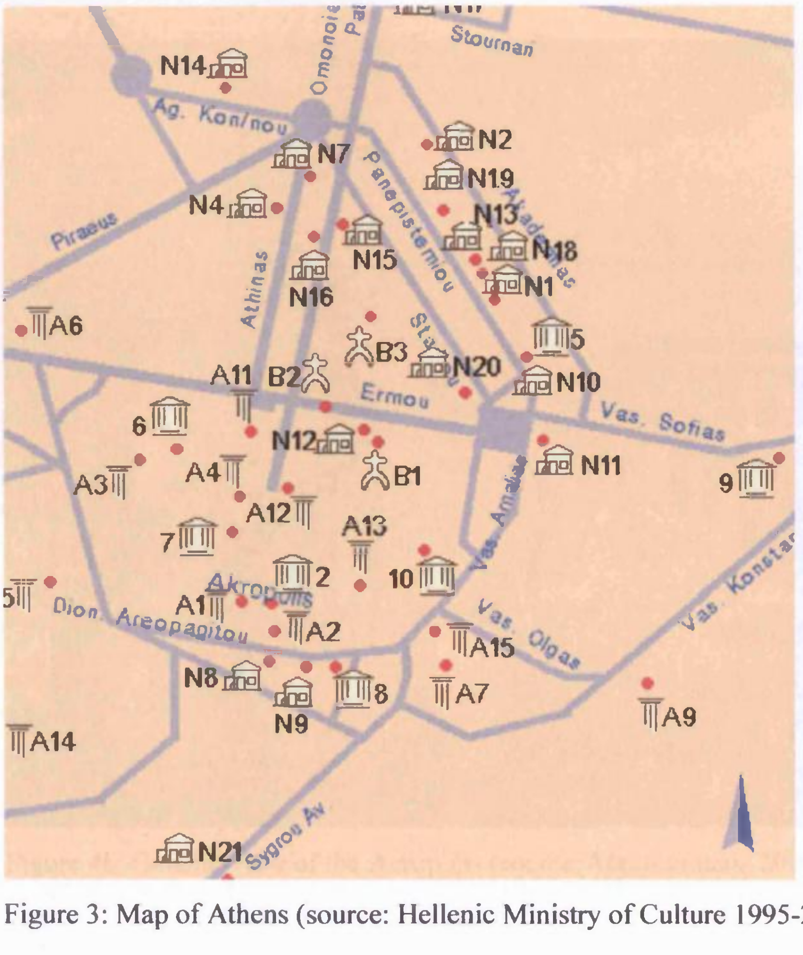

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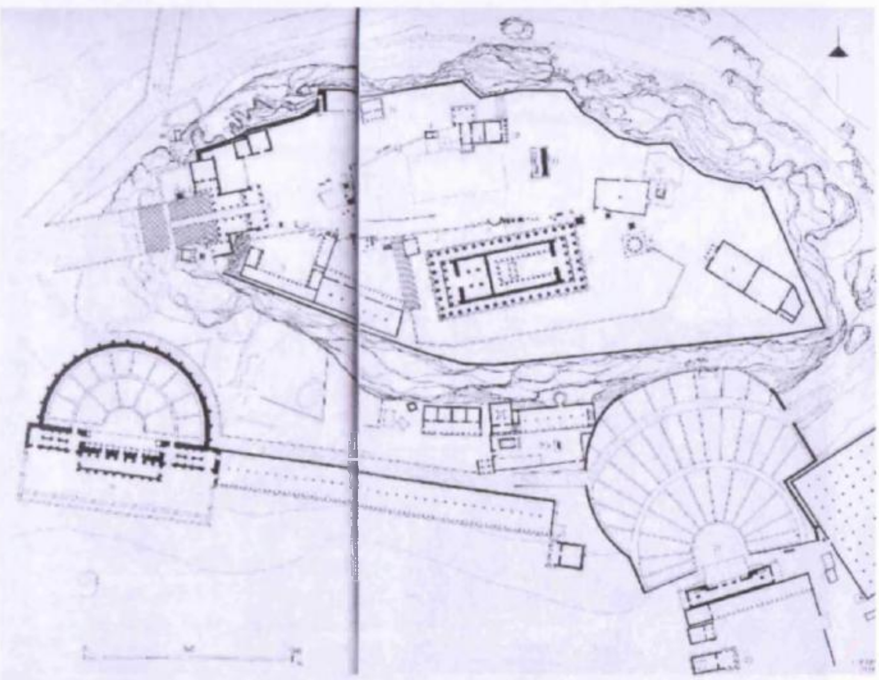

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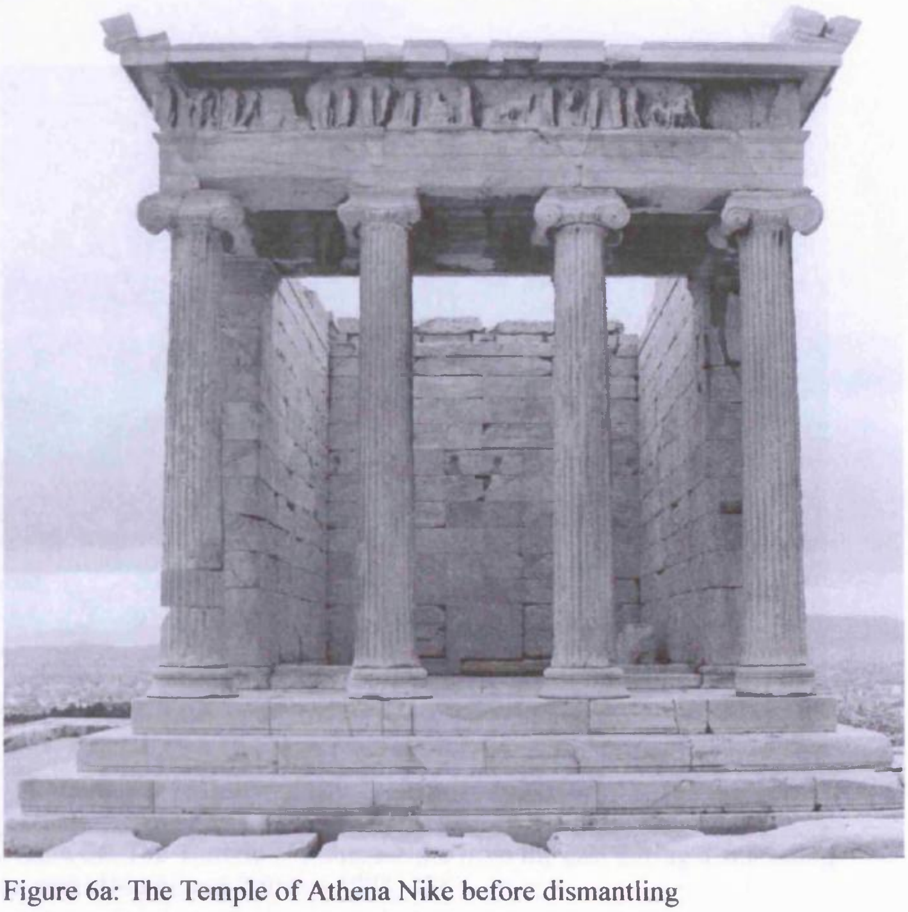

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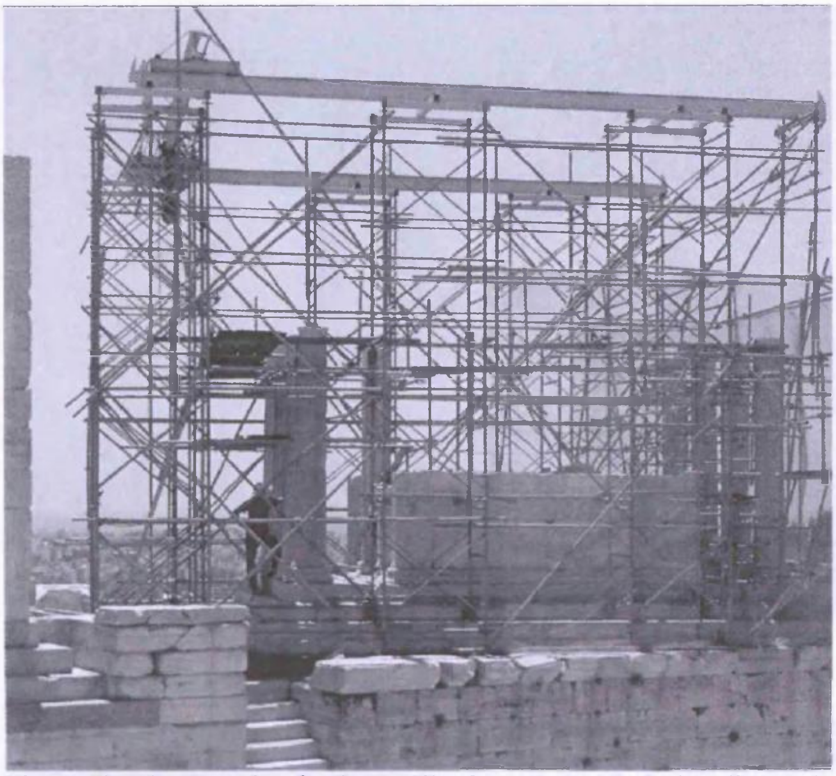

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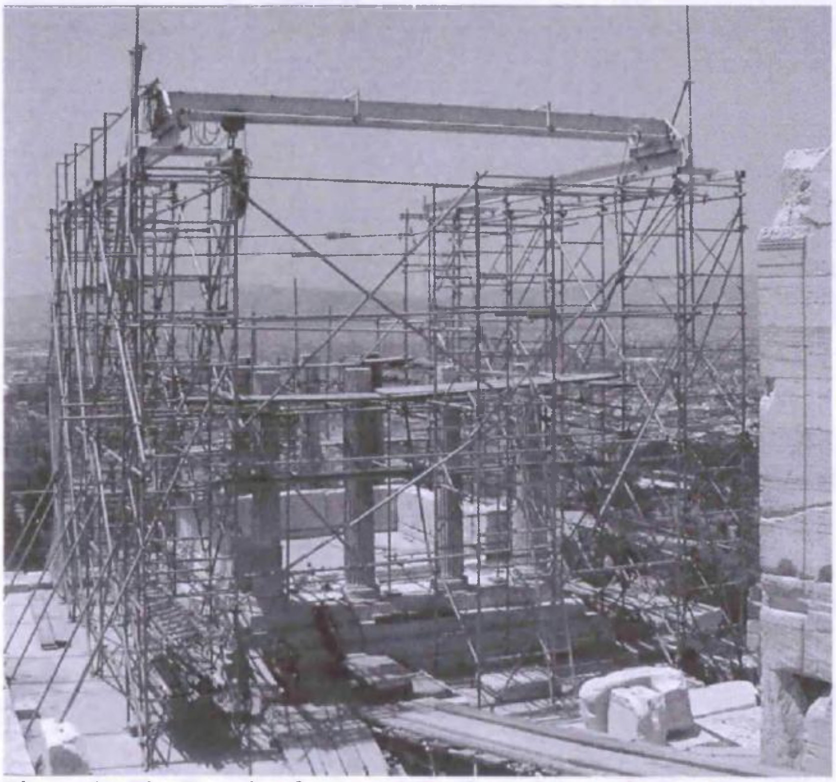

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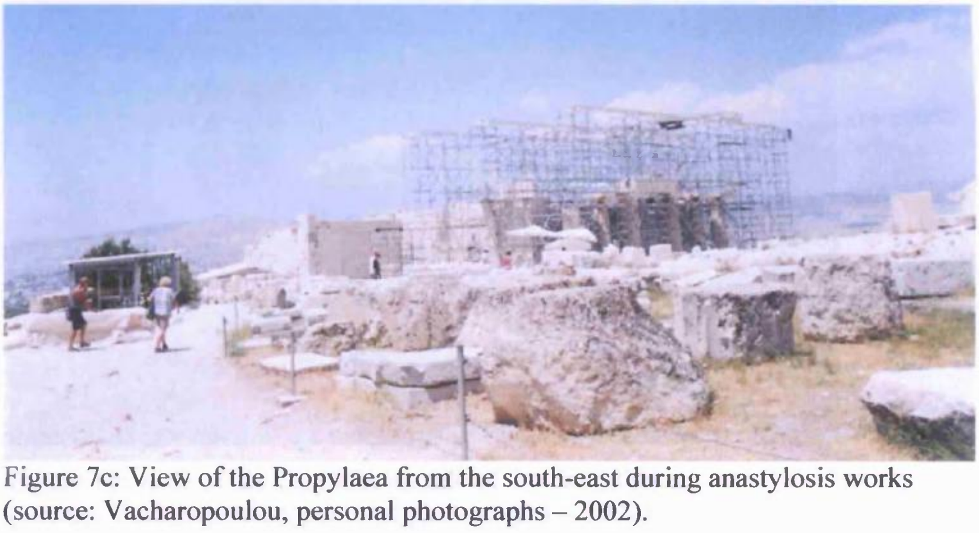

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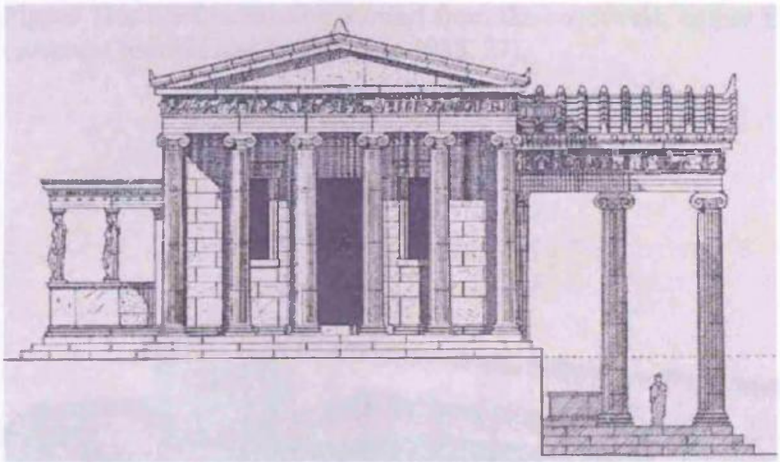

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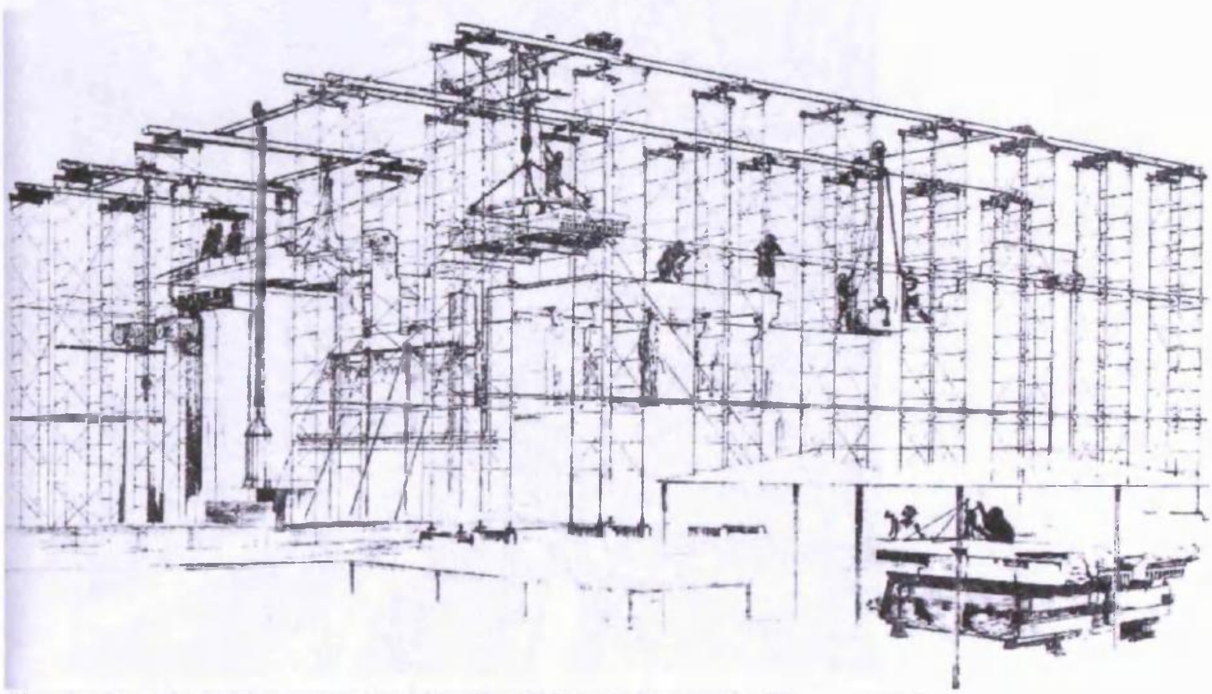

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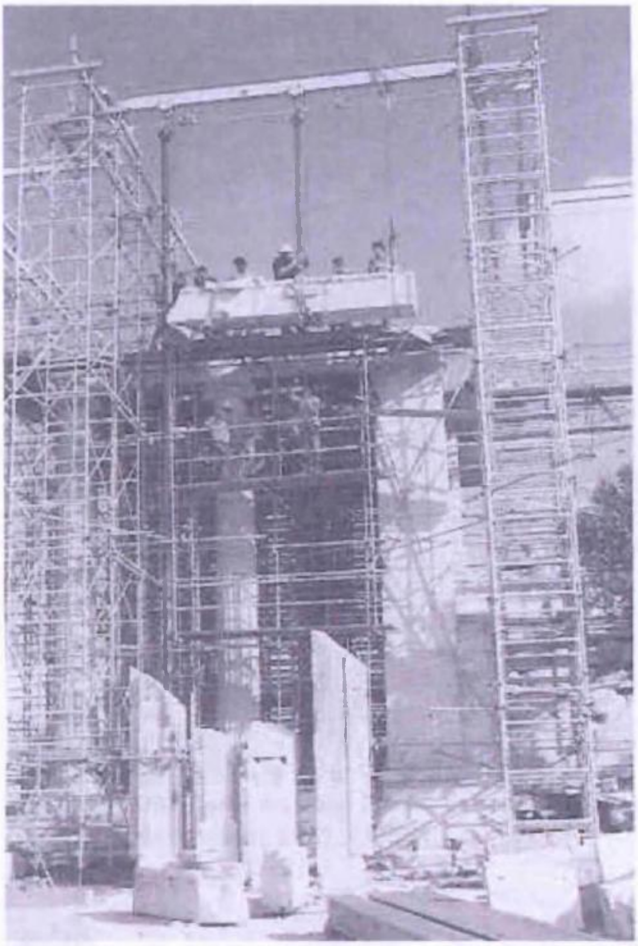

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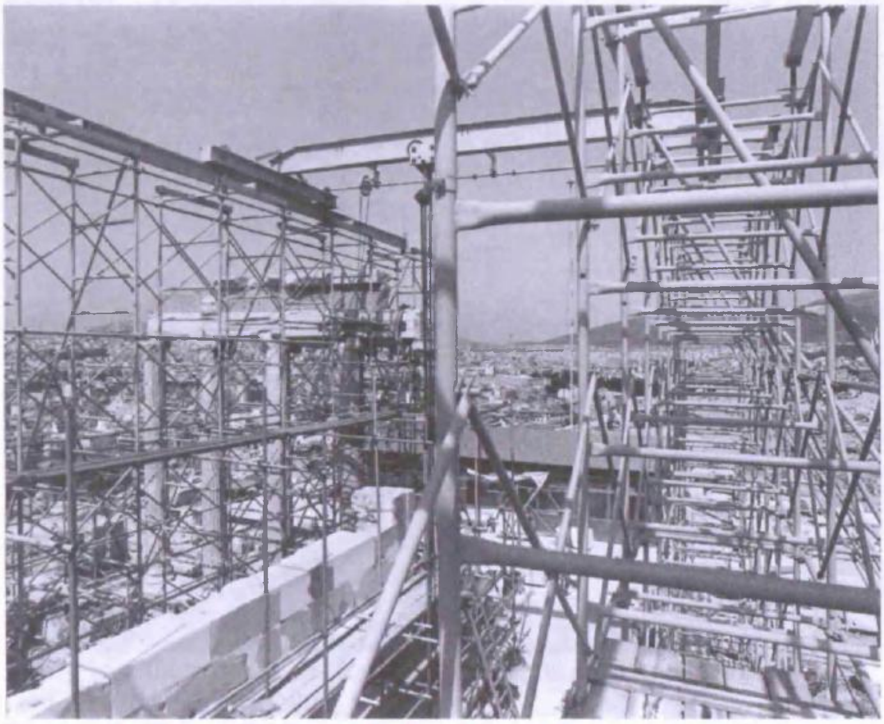

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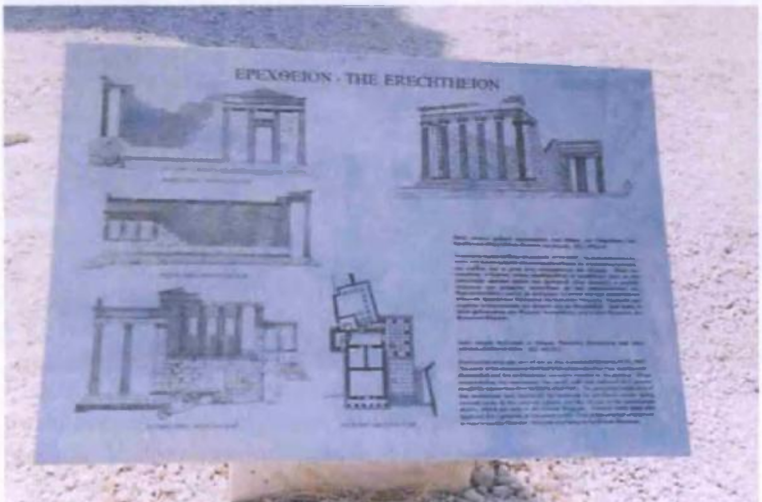

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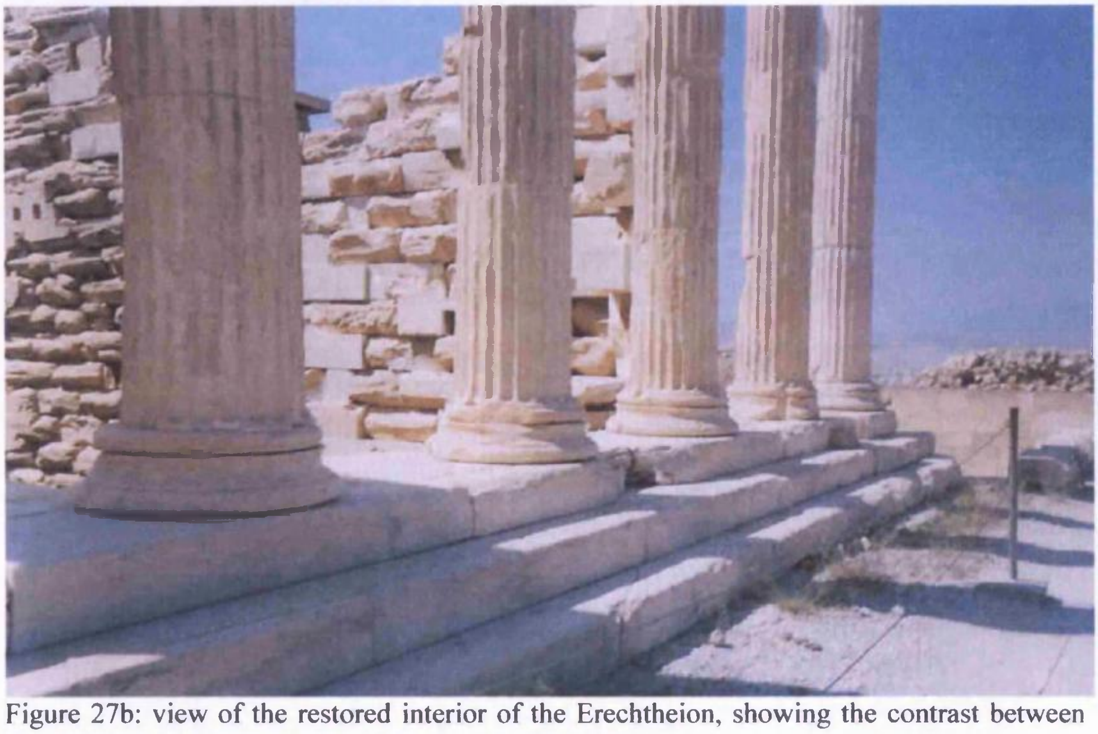

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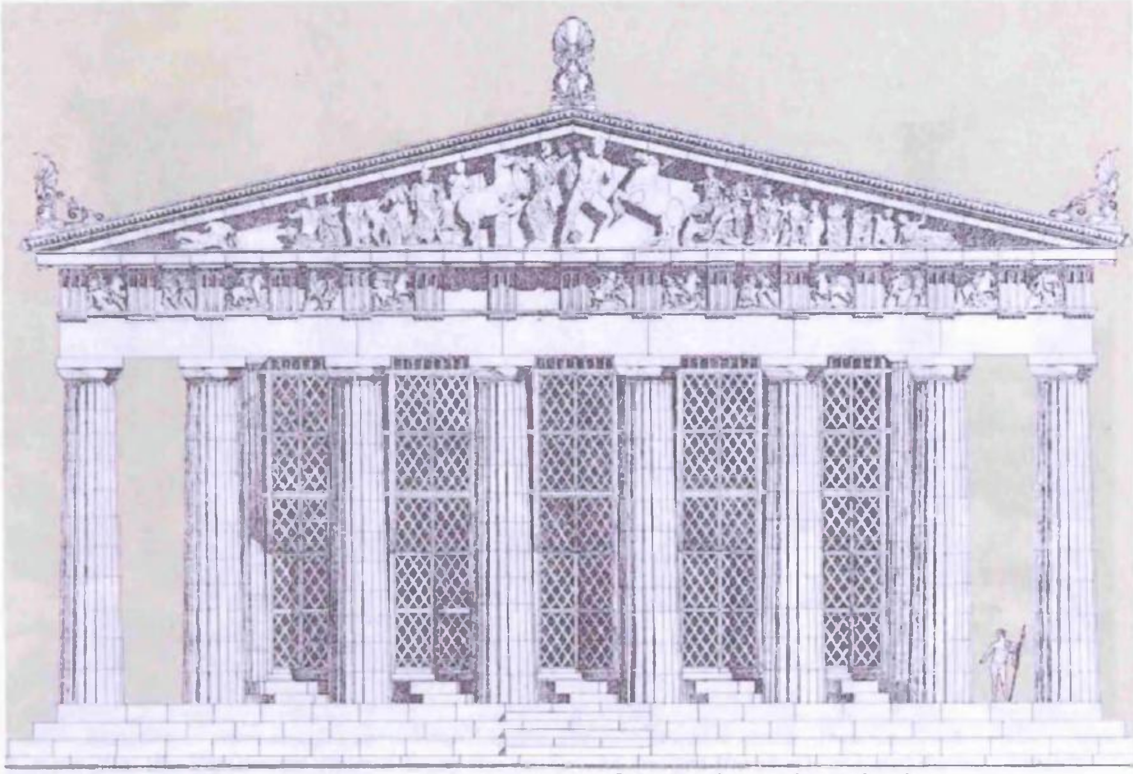

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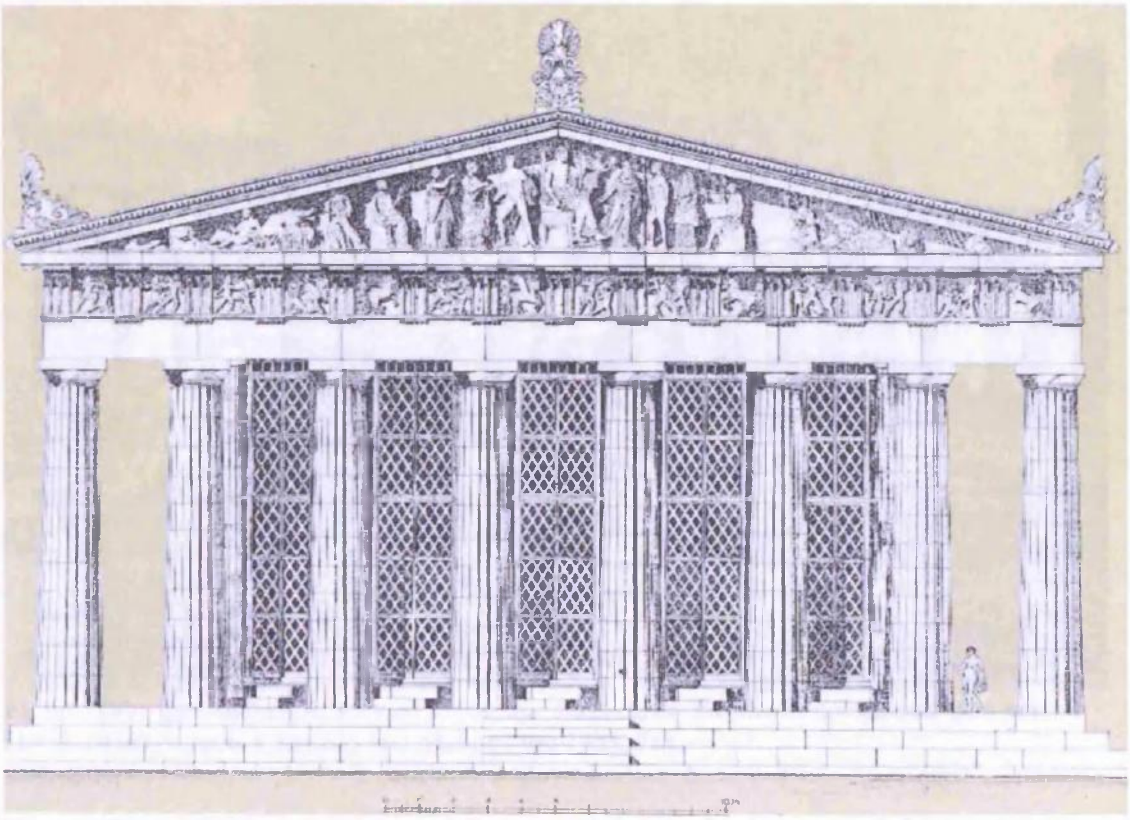

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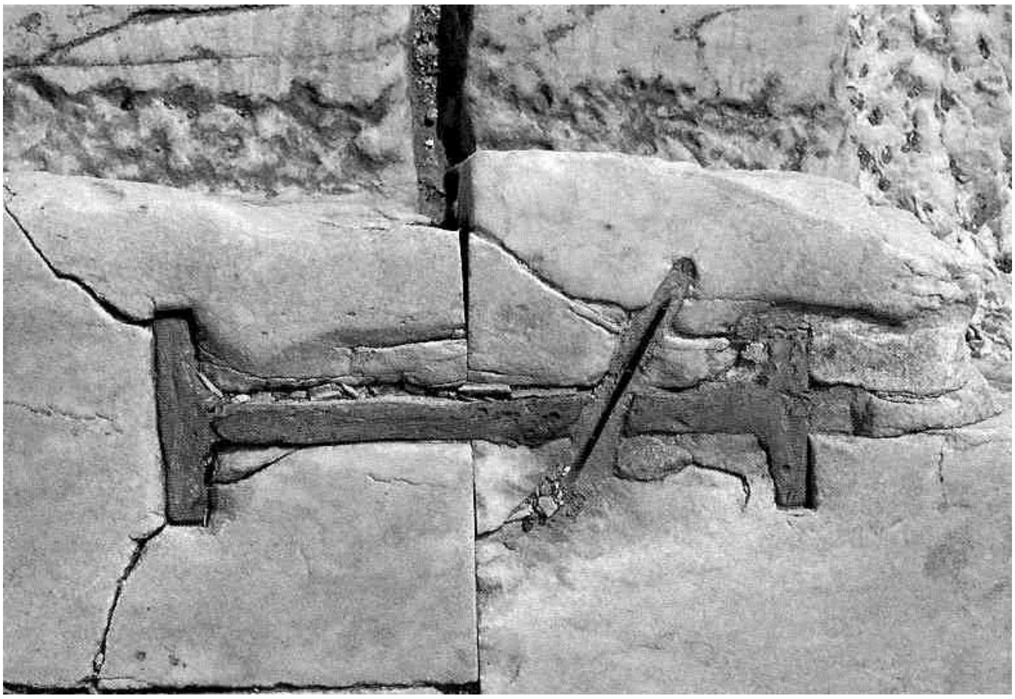

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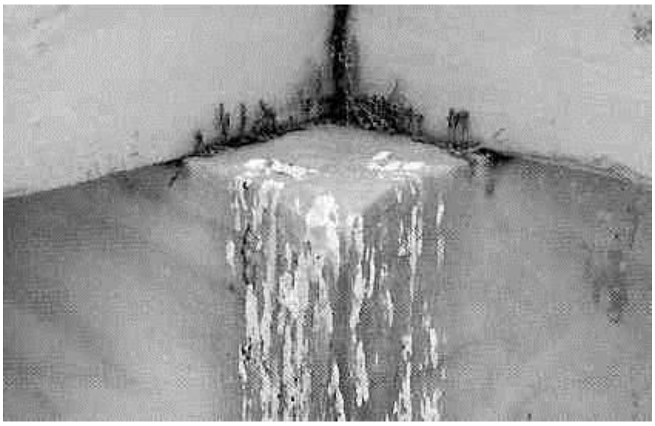

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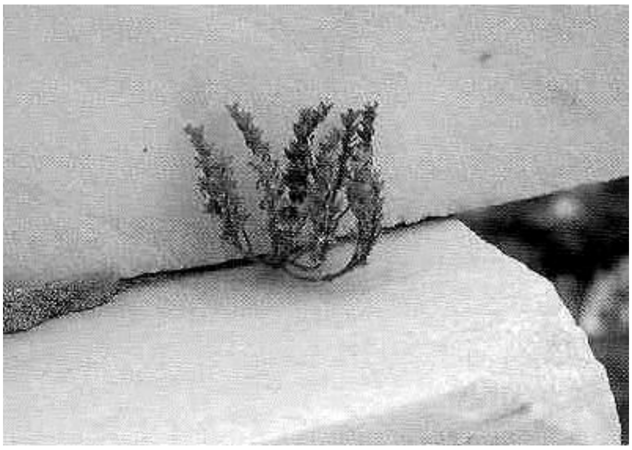

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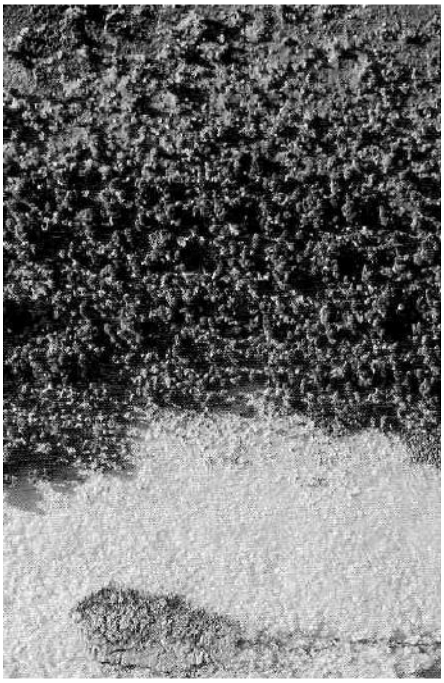

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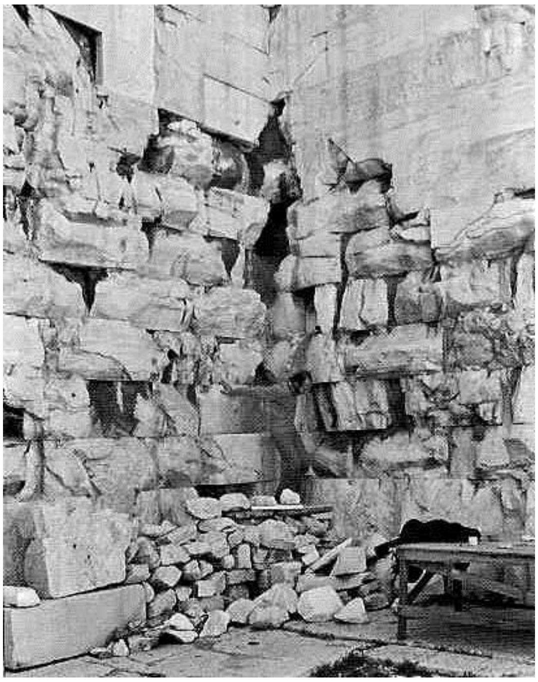

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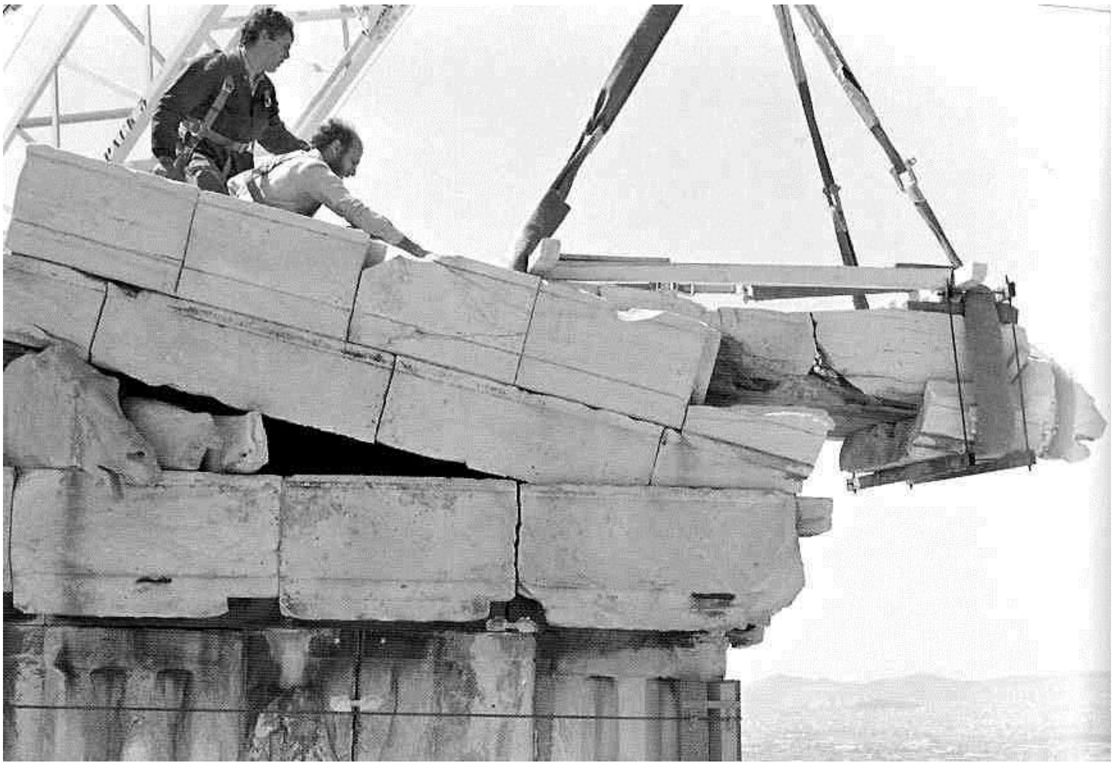

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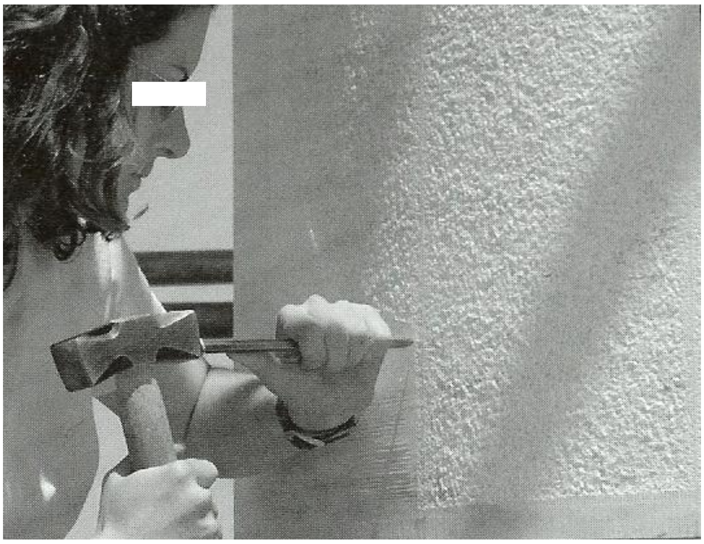

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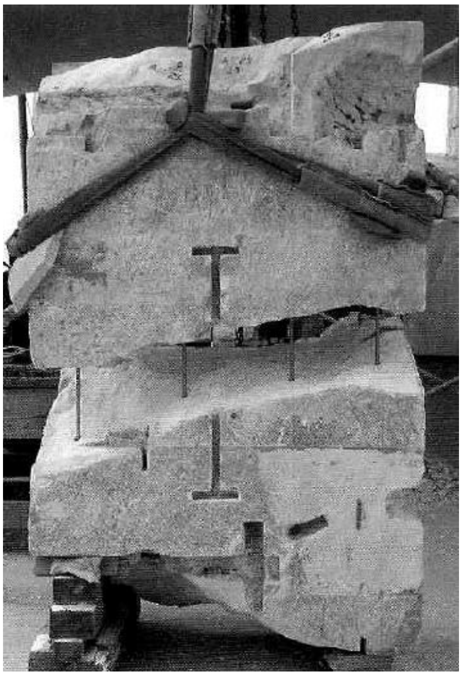

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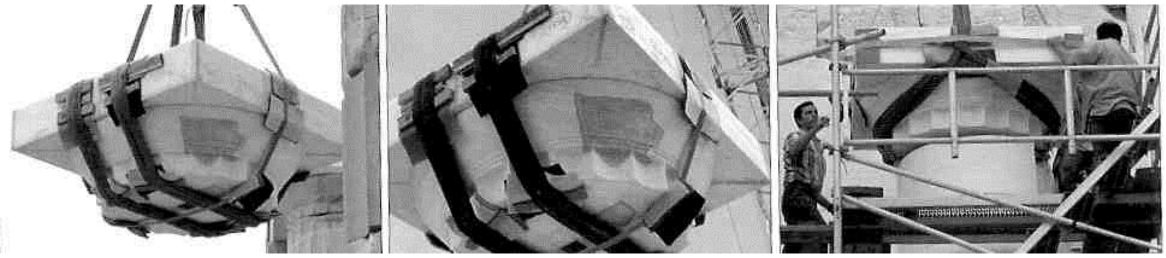

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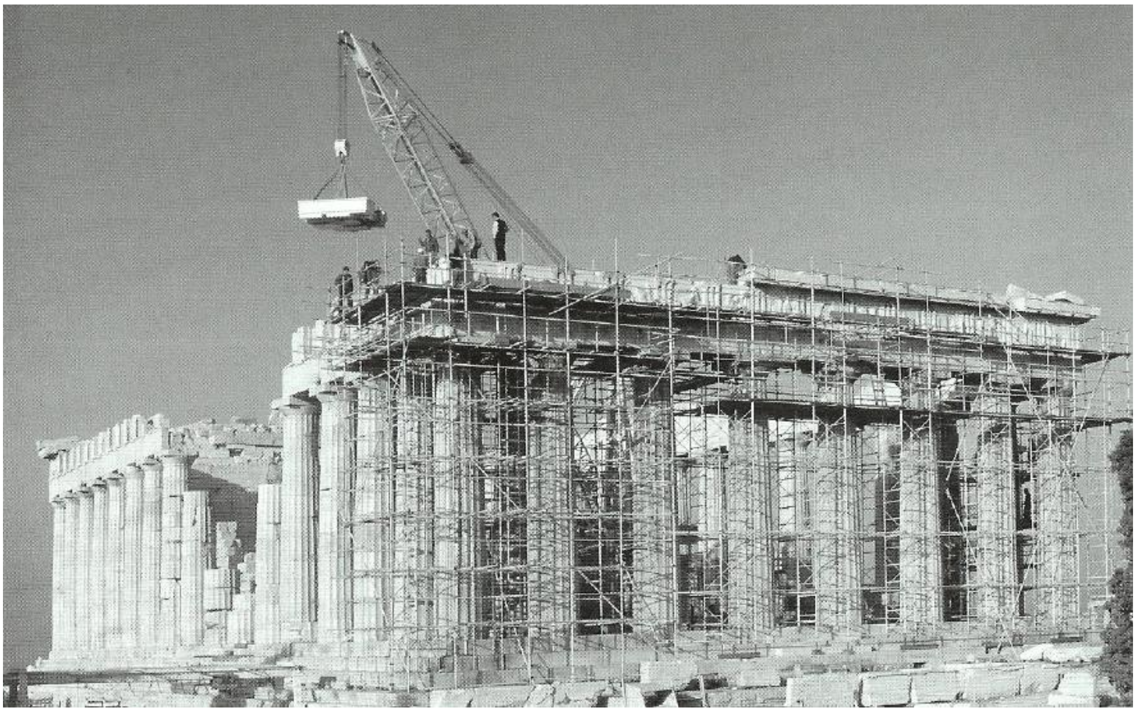

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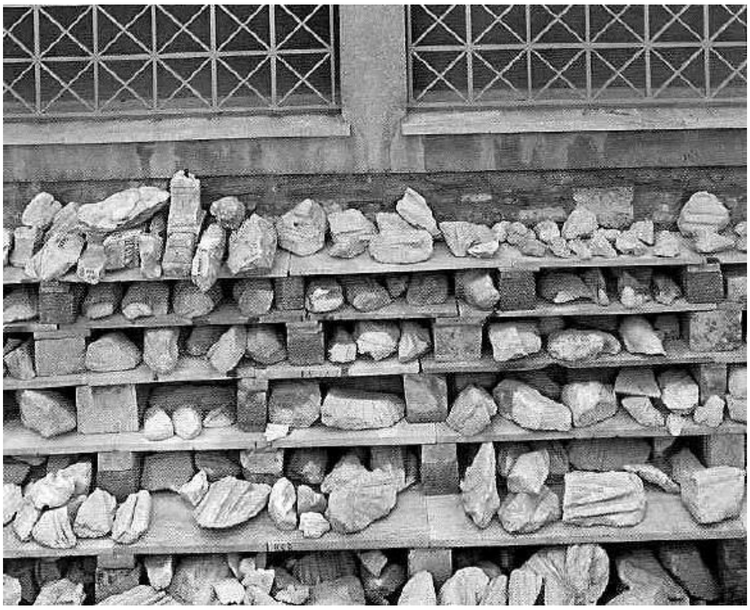

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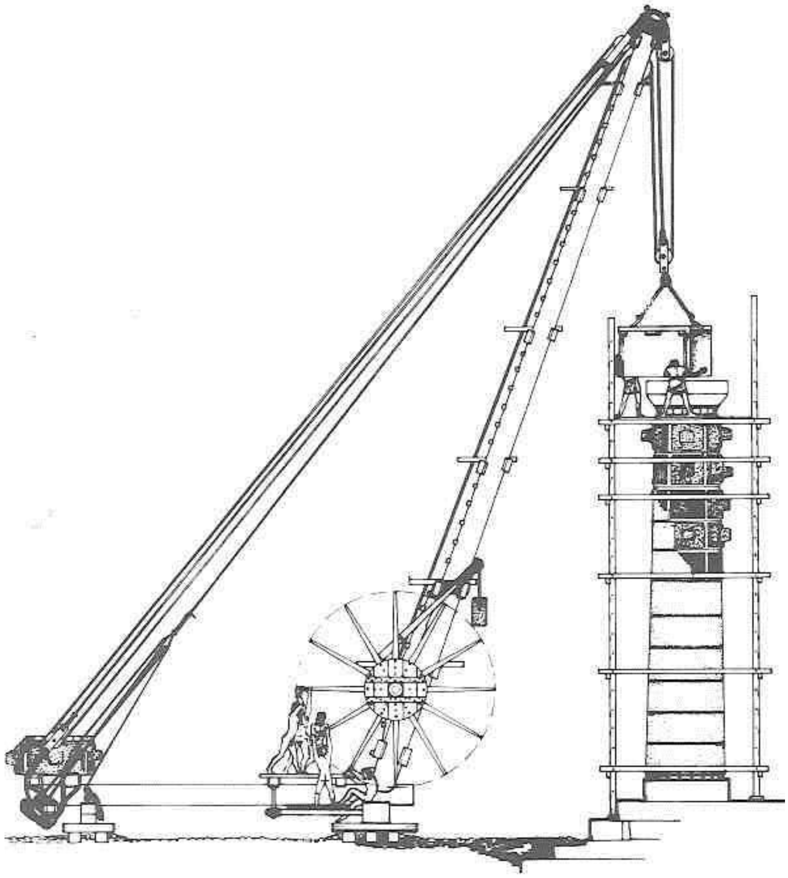

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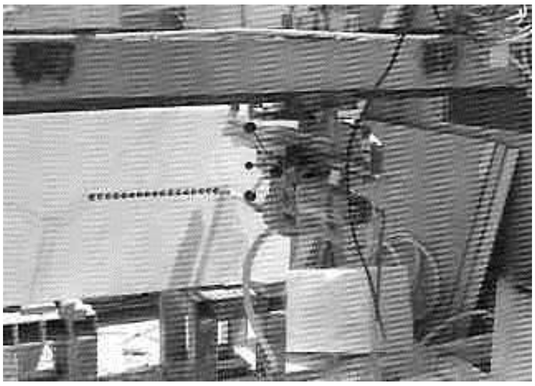

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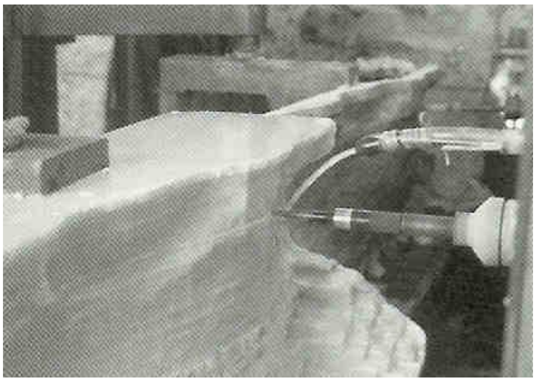

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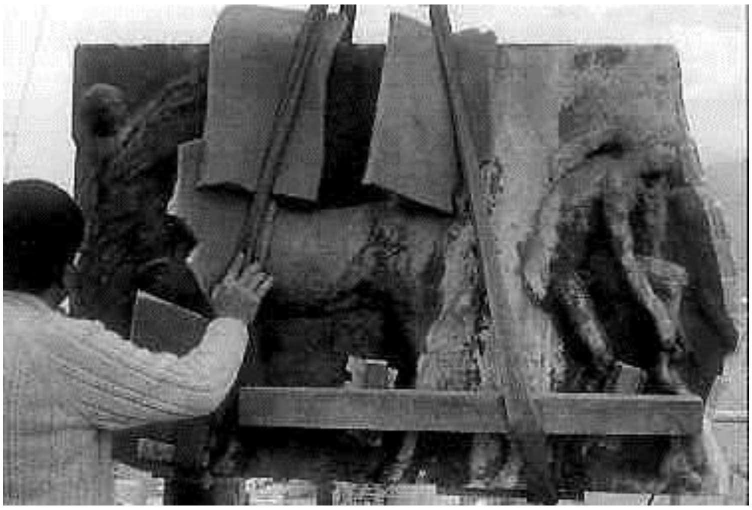

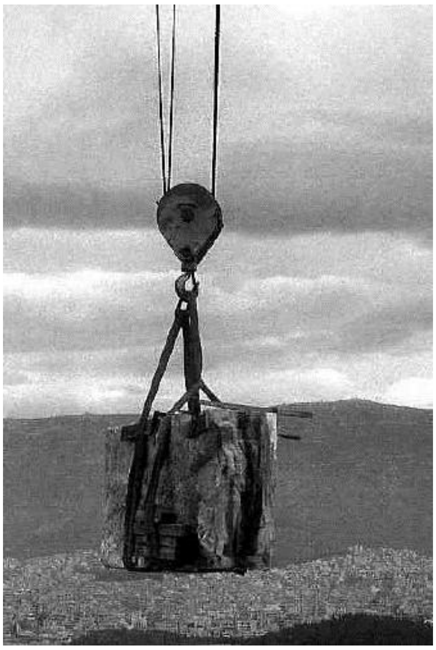

Figures 57a, b, c: dismantling and removal of members of the west ionic frieze of the Parthenon and their transfer to the Museum (source: Bouras and Zambas 2001, 39).

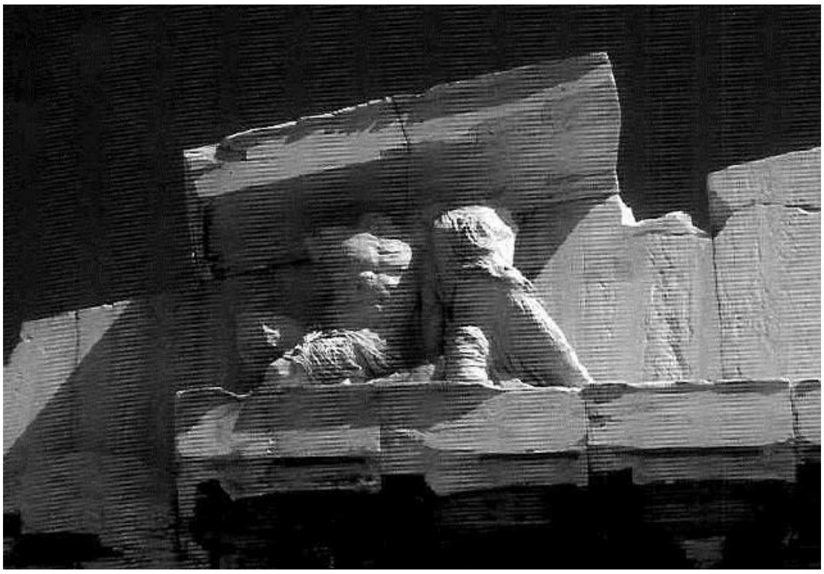

Figure 58: casts of statues from the west Parthenon pediment that were transferred to the Acropolis Museum (source: Bouras and Zambas 2001, 35)

Figure 59: west side of the Parthenon during the current anastylosis
(source: Vacharopoulou -- personal photographs, 2002).

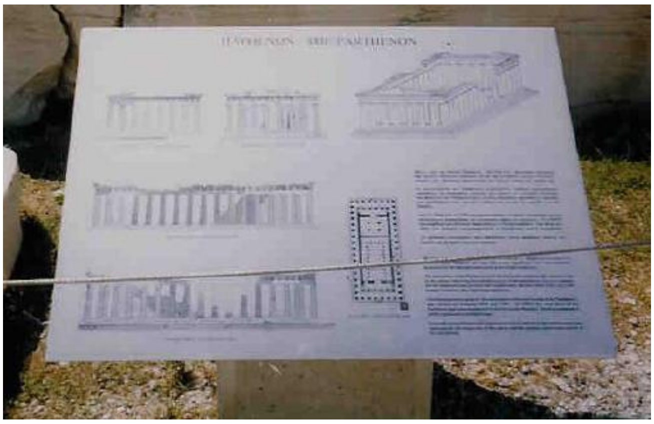

Figure 60a: notice board with information about the Parthenon
(source: Vacharopoulou -- personal photographs, 2002).

Figure 60b: tourists around the Parthenon
(source: Vacharopoulou -- personal photographs, 2002).

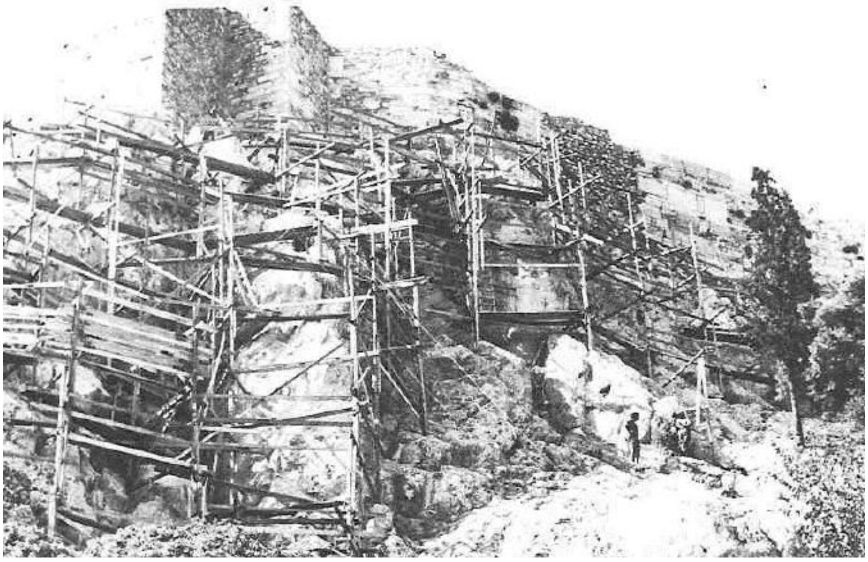

Figure 61: consolidating the Acropolis rock (source Casanaki and Mallouchou 1985, 33).

Figure 62a: the central walk before it was covered over with a thin layer of mortar (source Casanaki and Mallouchou 1985, 35).

Figure 62b: the central walk after it was covered over with a thin layer of mortar (1981) (source Casanaki and Mallouchou 1985, 35).

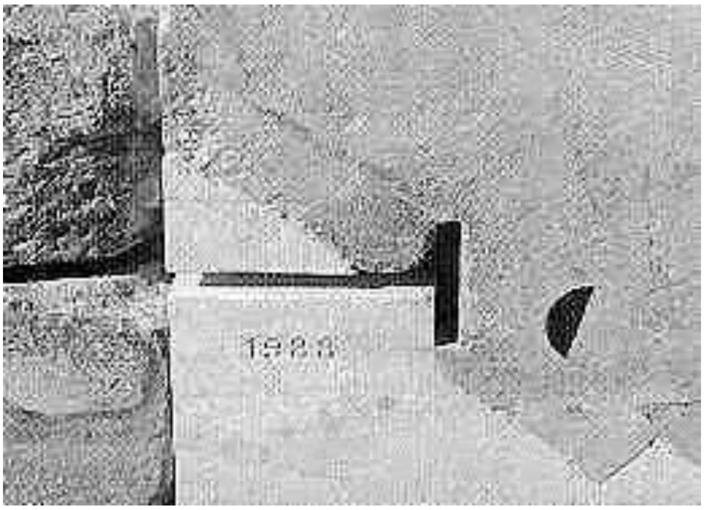

Figure 63: inscription of date of anastylosis on a new member in the Parthenon
(source: Schmidt 1993, 196).

Figure 64a: close view of members used in past restorations and suffering erosion damages (source: Vacharopoulou -- personal photographs, 2002).

Figure 64b: new column drum to be incorporated in the current anastylosis
(source: Vacharopoulou -- personal photographs, 2002).

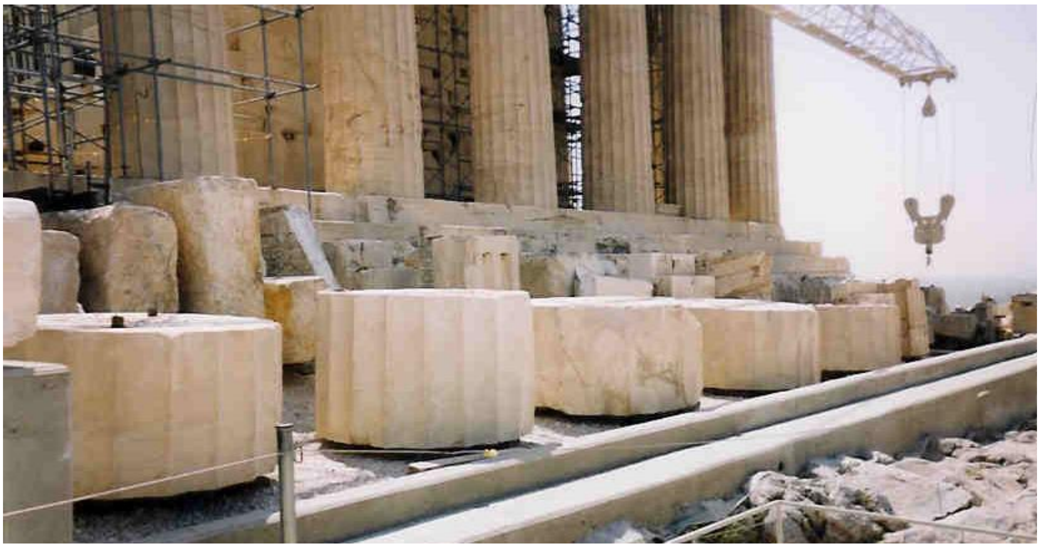

Figure 65: close view of members of the Parthenon outlined to be incorporated in the anastylosis (source: Vacharopoulou -- personal photographs, 2002).

Figure 66a: detail of the stylobate and the crepis of the south side of the Parthenon (source: Vacharopoulou -- personal photographs, 2002).

Figure 66b: detail of the stylobate, the crepis and the colonnade of the east side of the Parthenon (source: Vacharopoulou – personal photographs, 2002).

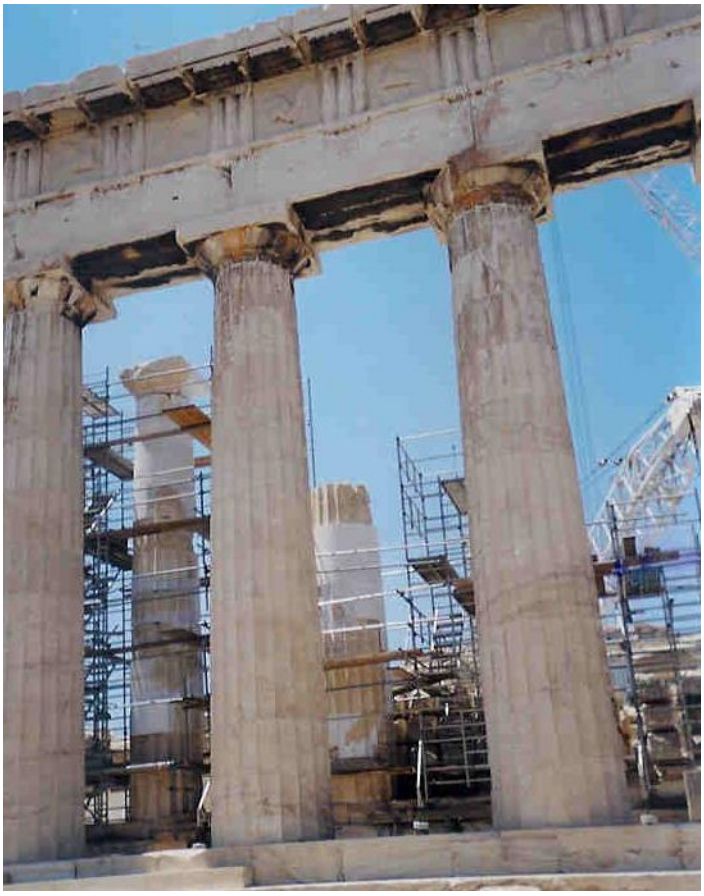

Figure 67a: detail of the restored columns on the interior of the Parthenon
(source: Vacharopoulou -- personal photographs 2002).

Figure 67b: detail of the restored columns on the interior of the Parthenon
(source: Vacharopoulou -- personal photographs 2002).

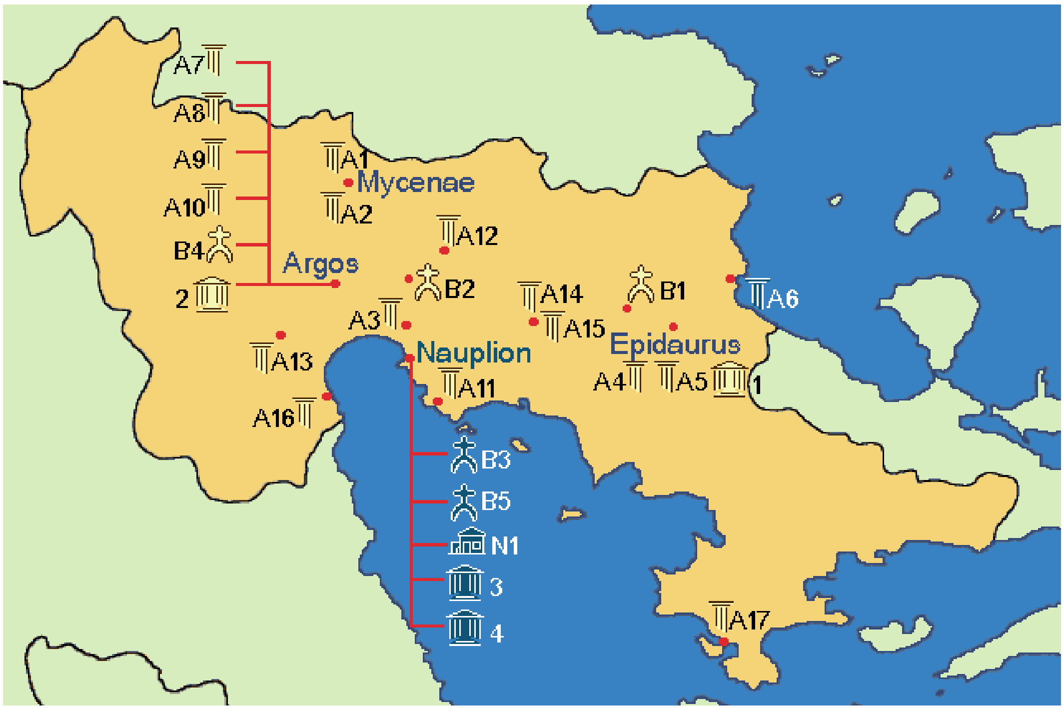

Figure 68: map of northeast Peloponnese, specifically Argolide
(source: Hellenic Ministry of Culture 1995-2001).

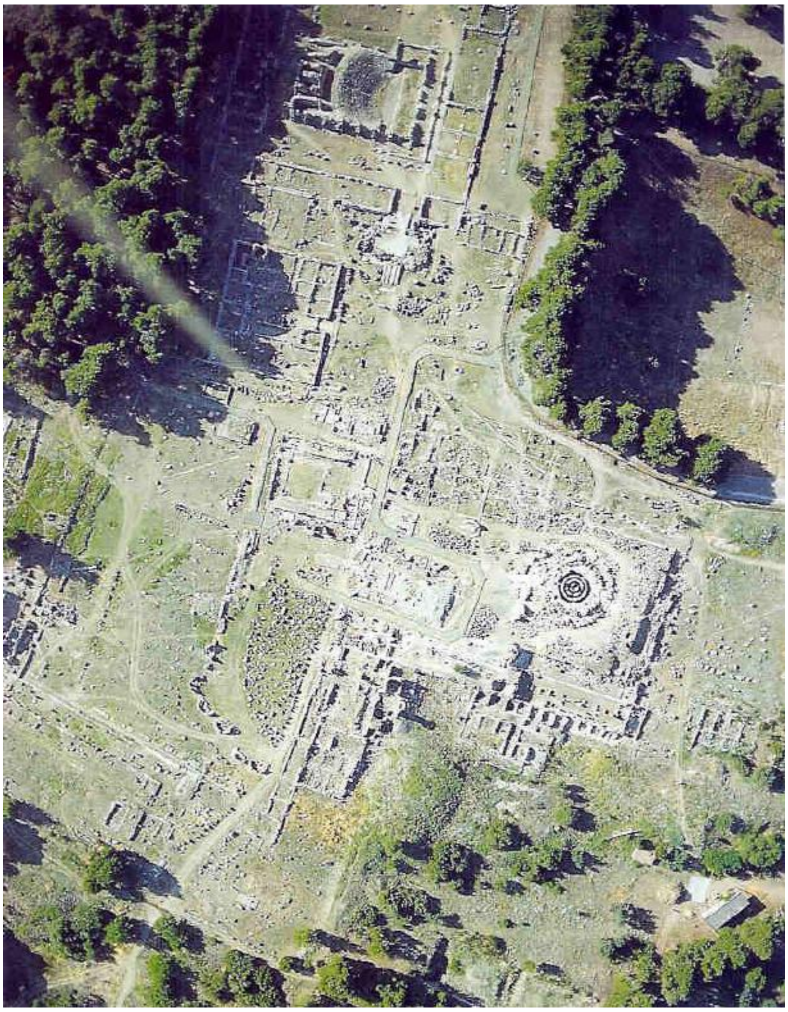

Figure 69a: aerial view of the Asklepieion of Epidauros
(source: CCEM 1999, 12).

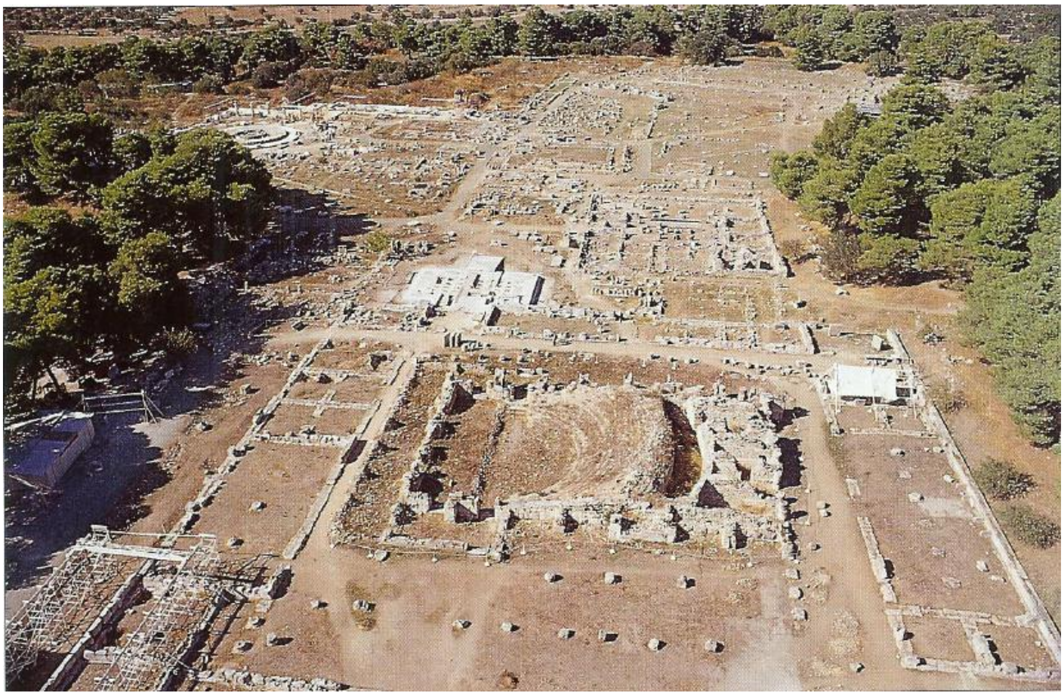

Figure 69b: Closer view of the Sanctuary of Asklepieios
(source: Kyriaki 1999, 34)

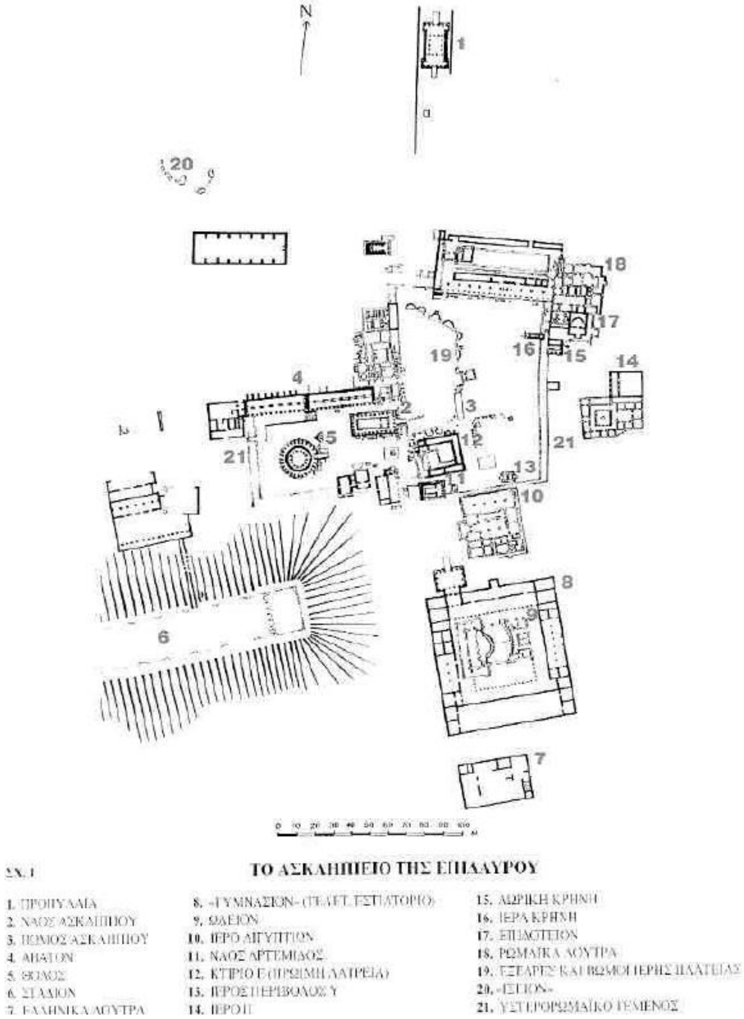

Figure 70: plan of the Asklepieion of Epidauros
(source: CCEM 1999, 13).

Figure 71: sign in the site, indicating inclusion of Epidauros in the World Heritage List (source: Vacharopoulou -- personal photographs, 2002).

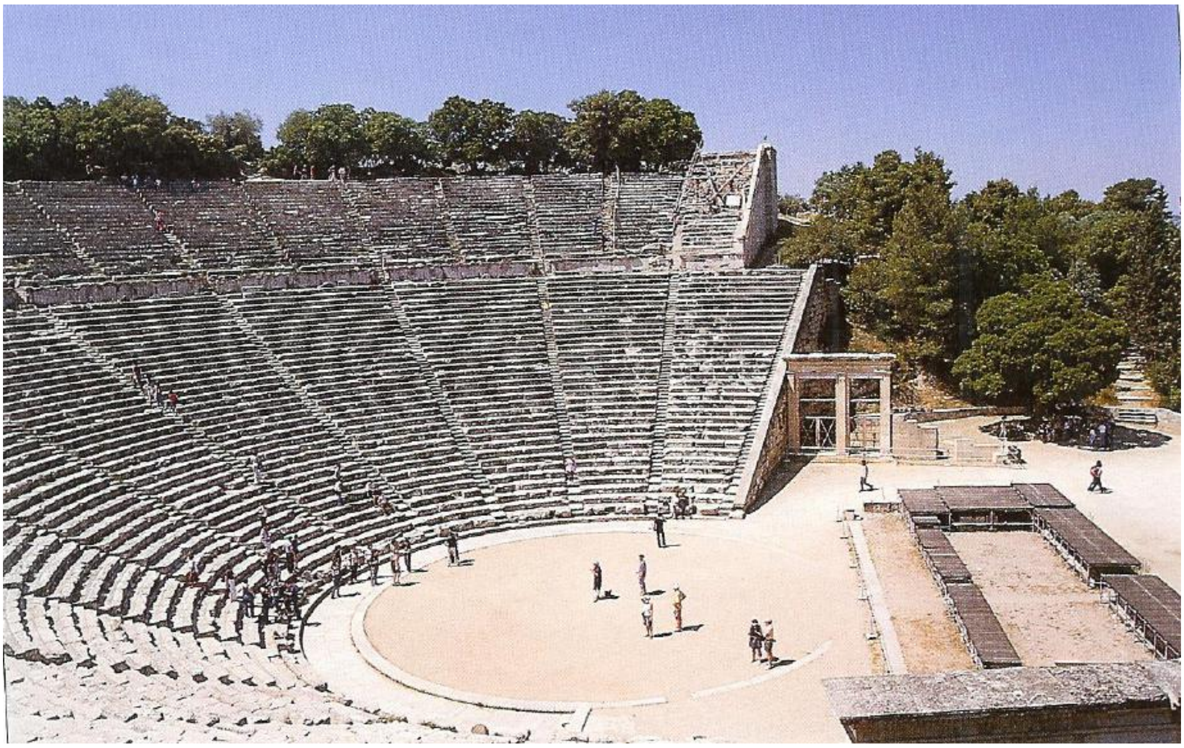

Figure 72: the theatre after restoration of the west pylon (source: Lambrinoudakis 1999, 19).

Figure 73a: the Tholos of Polykleitos before the interventions
(source: Anastasiadou 1999, 23).

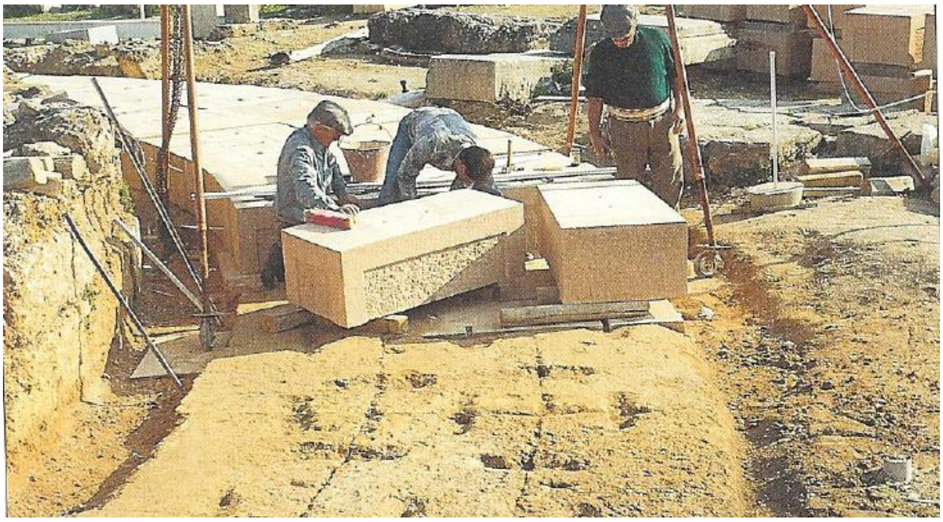

Figure 73b: the Tholos of Polykleitos during the interventions
(source: Anastasiadou 1999, 26).

Figure 73c: the Tholos of Polykleitos during the interventions
(source: Anastasiadou 1999, 26).

Figure 74: the Stadium seen from the north
(source: Kyriaki 1999, 97)

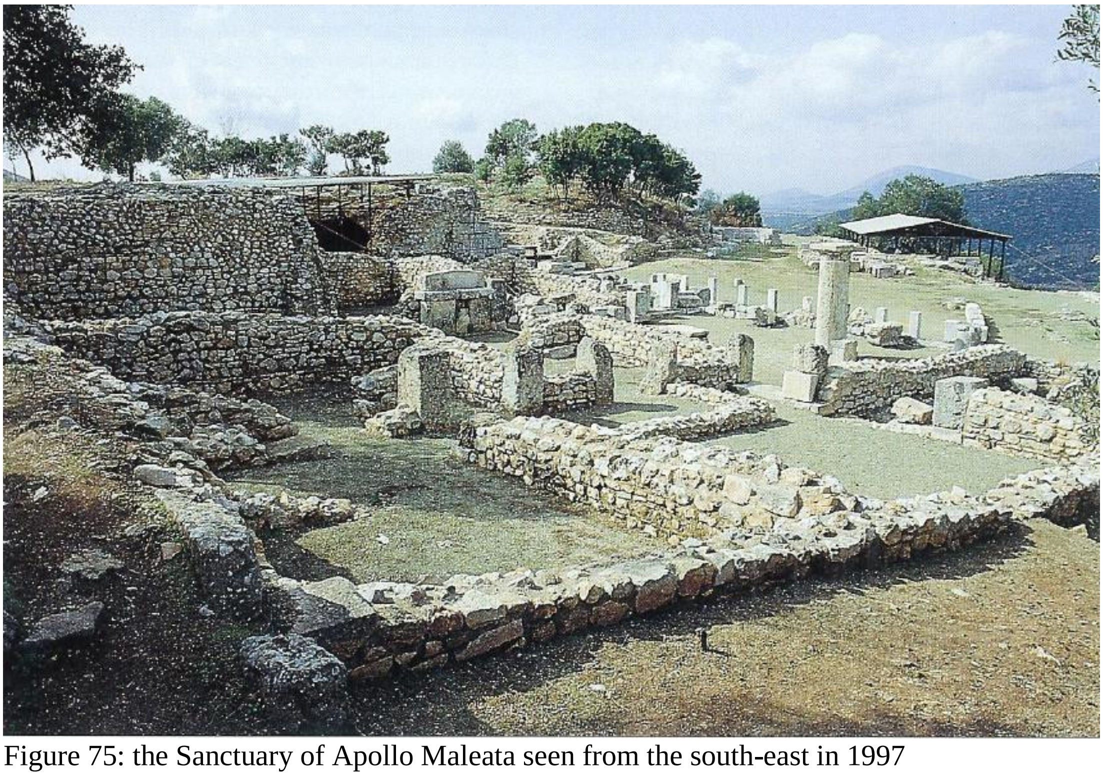

Figure 75: the Sanctuary of Apollo Maleata seen from the south-east in 1997
(source: Lambrinoudakis1999b, 61)

Figure 76a: works in the Avaton Stoa, for diagnosing the state of the structure and consolidating its surviving parts
(source: Vacharopoulou -- personal photographs, 2002).

Figure 76b: works in the Avaton Stoa, for diagnosing the state of the structure and consolidating its surviving parts
(source: Vacharopoulou -- personal photographs, 2002)

Figure 76c: works in the Avaton Stoa, for consolidating its surviving parts
(source: Vacharopoulou -- personal photographs, 2002).

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(source: Vacharopoulou -- personal photographs, 2002).

Figure 77a: anastylosis works in the Avaton Stoa, showing re-integrations and additions of stone members (source: Vacharopoulou -- personal photographs, 2002).

Figure 77b: surviving conserved members of the Avaton Stoa, ready to be reassembled (source: Vacharopoulou -- personal photographs, 2002).

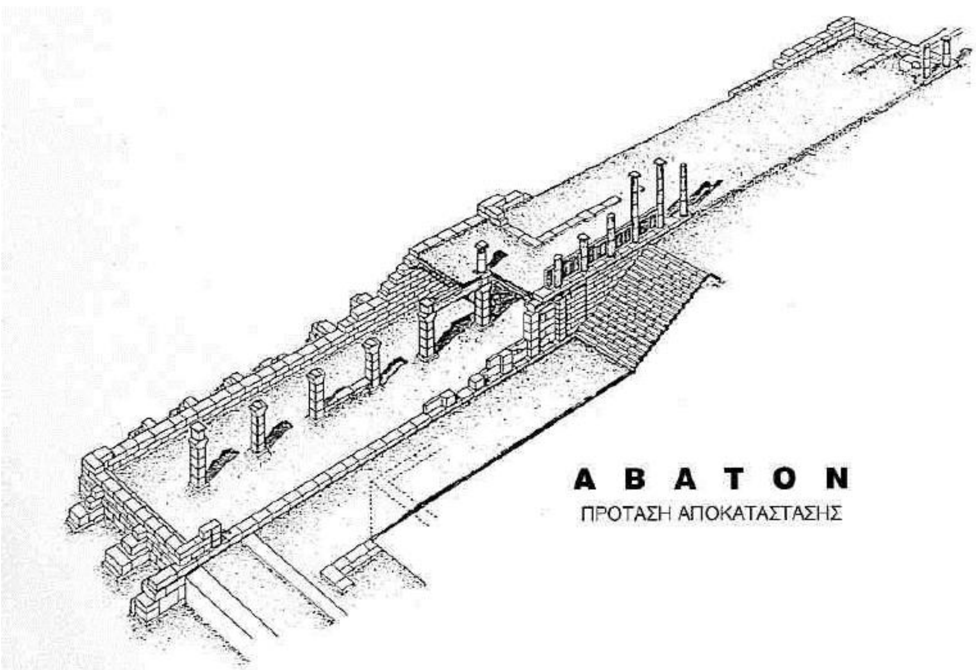

Figure 78: the graphic plan of the anastylosis proposal of the Avaton Stoa
(source: Maurommatidis 1999, 31).

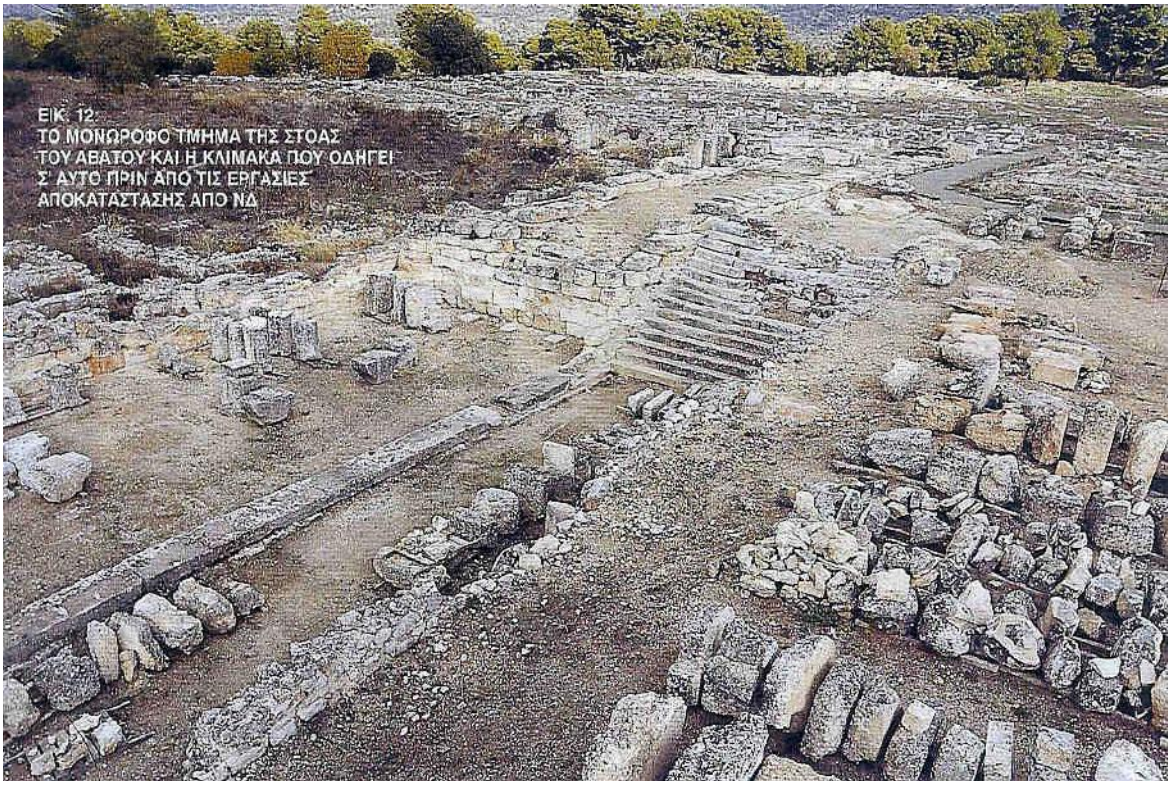

Figure 79a: the one-story part of the Stoa of Avaton and the staircase that leads to it before the works of restoration from the northwest (source: Maurommatidis 1999, 29).

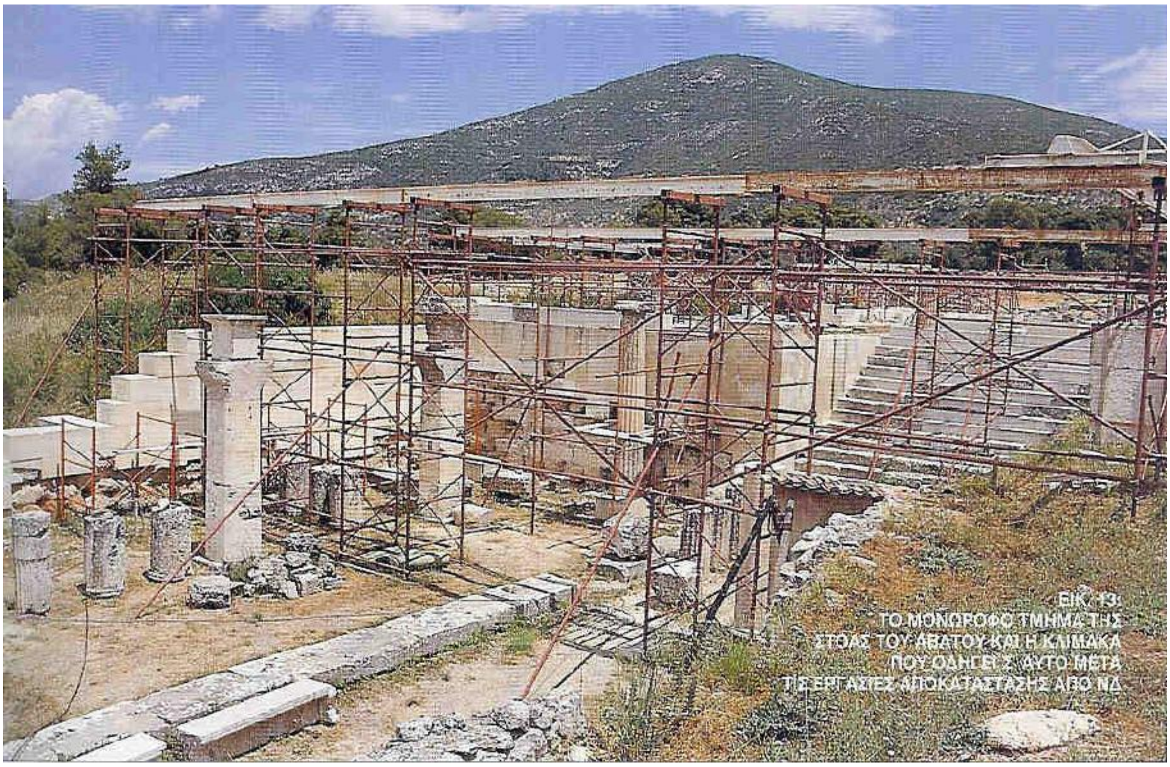

Figure 79b: the one-story part of the Stoa of Avaton and the staircase that leads to it after the works of restoration from the northwest (source: Maurommatidis 1999, 29).

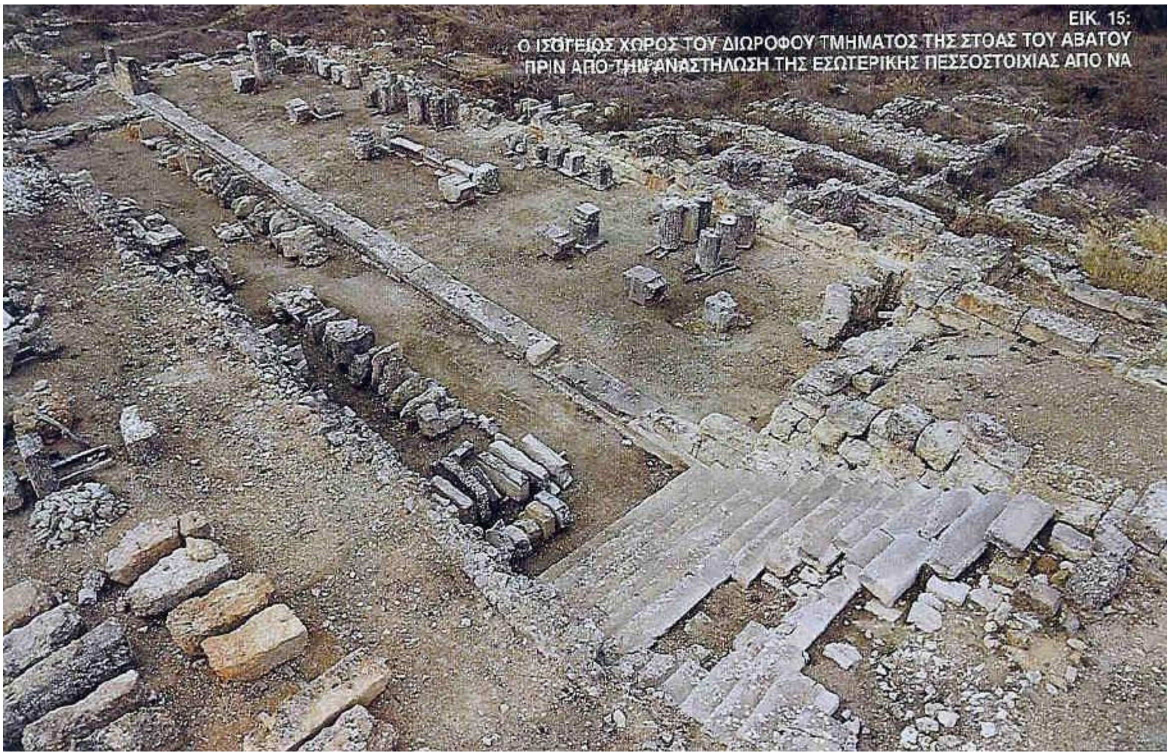

Figure 80a: the ground floor of the two-storey part of the Stoa of Avaton before anastylosis of the internal colonnade from northeast (source: Maurommatidis 1999, 33).

Figure 80b: the ground floor of the two-storey part of the Stoa of Avaton after anastylosis of the internal colonnade from northeast (source: Maurommatidis 1999, 33).

Figure 81a: anastylosis works in the Avaton Stoa with integration of new and original members (source: Vacharopoulou -- personal photographs, 2002).

Figure 81b: anastylosis works in the Avaton Stoa with integration of new and original members (source: Vacharopoulou -- personal photographs, 2002).

Figure 82: a column from the Avaton Stoa, as it has survived, without knowing its original height (source: Vacharopoulou -- personal photographs, 2002).

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Figure 84: laboratory experiment for production of artificial stone (source: Makrypodi *et al*. 1999, 88).

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Figure 85b: the ruins of the Gymnasium of Epidauros, before the anastylosis (source: Haritonidou 1978, 37).

Figure 85c: anastylosis works in the Propylon of the Gymnasium

(source: Vacharopoulou -- personal photographs, 2002).

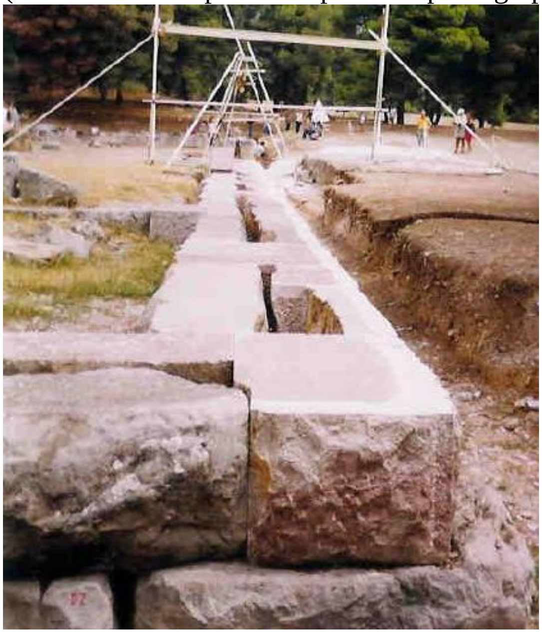

Figure 86a: anastylosis on the Gymnasium Propylon showing how exposed surfaces will be protected by reassembly of old members and integration of new ones
(source: Vacharopoulou -- personal photographs, 2002).

Figure 86b: anastylosis on the Gymnasium Propylon showing how exposed surfaces will be protected by reassembly of old members and integration of new ones
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Figure 87: view of gathered fragments of the Gymnasium Propylon
(source: Vacharopoulou -- personal photographs, 2002).

Figure 88: view of restored columns of the Gymnasium Propylon
(source: Vacharopoulou -- personal photographs, 2002).

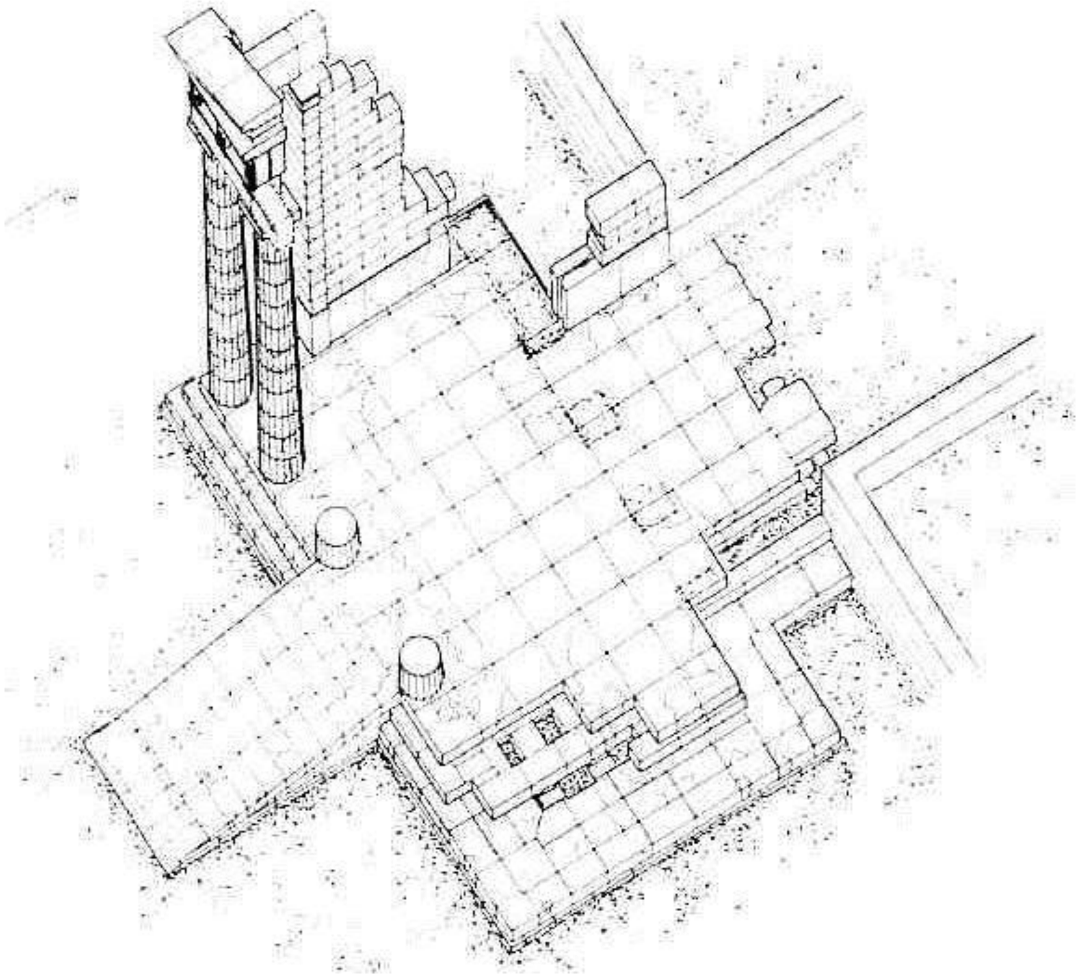

Figure 89: the axonometric plan of the restoration proposal of the Gymnasium Propylon (source: Kyriaki 1999, 37).

Figure 90: the Gymnasium Propylon after restoration of the crepis up to the second stair (source: Kyriaki 1999, 38).

Figure 91a: the west wall of the Gymnasium from the north before the anastylosis works (source: Kyriaki 1999, 35).

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Figure 92: view of the Gymnasium Propylon showing the amount of surviving material in the building (source: Vacharopoulou -- personal photographs, 2002).

Figure 93: view of restored stone members of the Propylon of the Gymnasium (source: Vacharopoulou -- personal photographs, 2002).

Figure 94: view of the Gymnasium Propylon during its anastylosis
(source: Vacharopoulou -- personal photographs, 2002).

Figure 95: view of the Propylon of the Gymnasium during its anastylosis
(source: Vacharopoulou -- personal photographs, 2002).

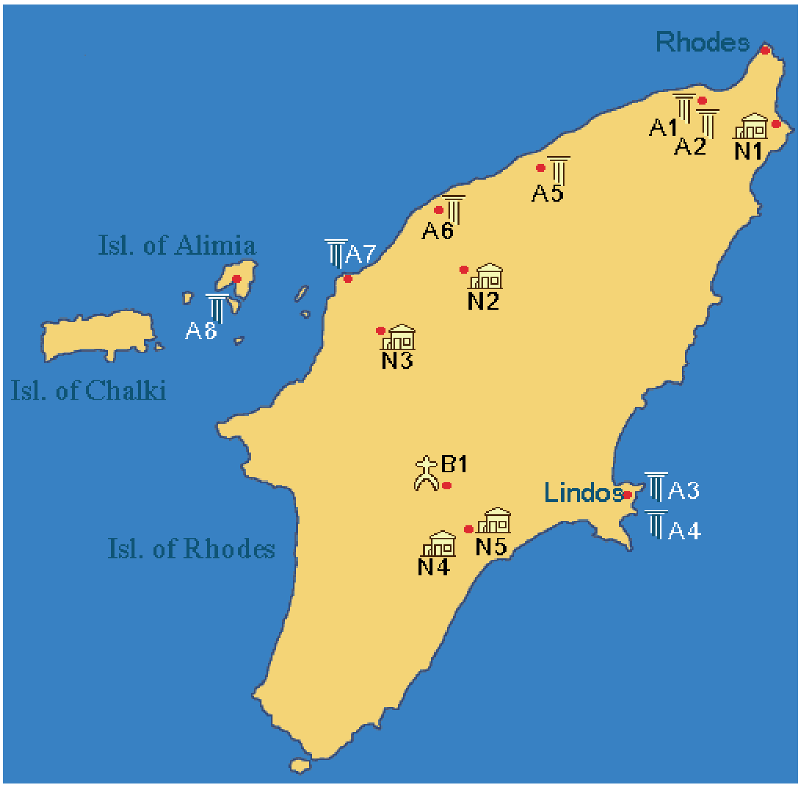

Figure 96: map of the island of Rhodes
(source: Hellenic Ministry of Culture 1995-2001).

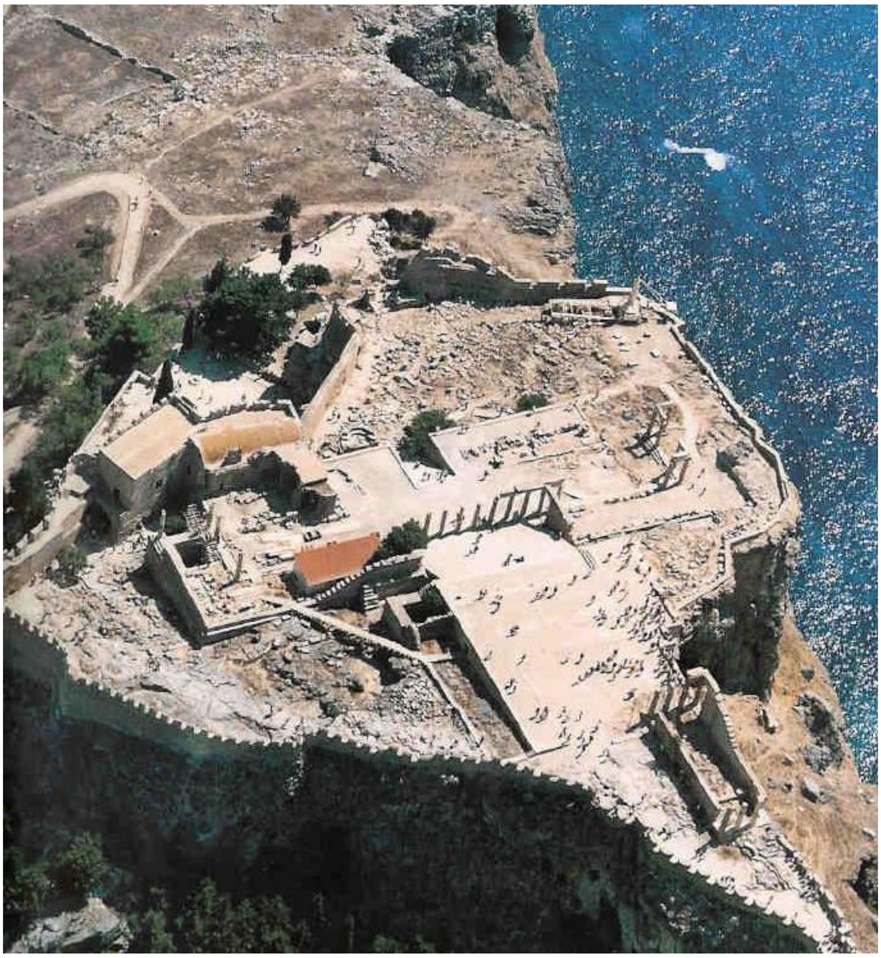

Figure 97: aerial view of the Acropolis from the southwest (1998)
(source: Papachristodoulou 2002, 29).

Figure 98a: general view of the Acropolis of Lindos (1990)
(source: Papachristodoulou 2002, 20).

Figure 98b: general view of the Acropolis of Lindos (2003)
(source: Vacharopoulou -- personal photographs, 2003).

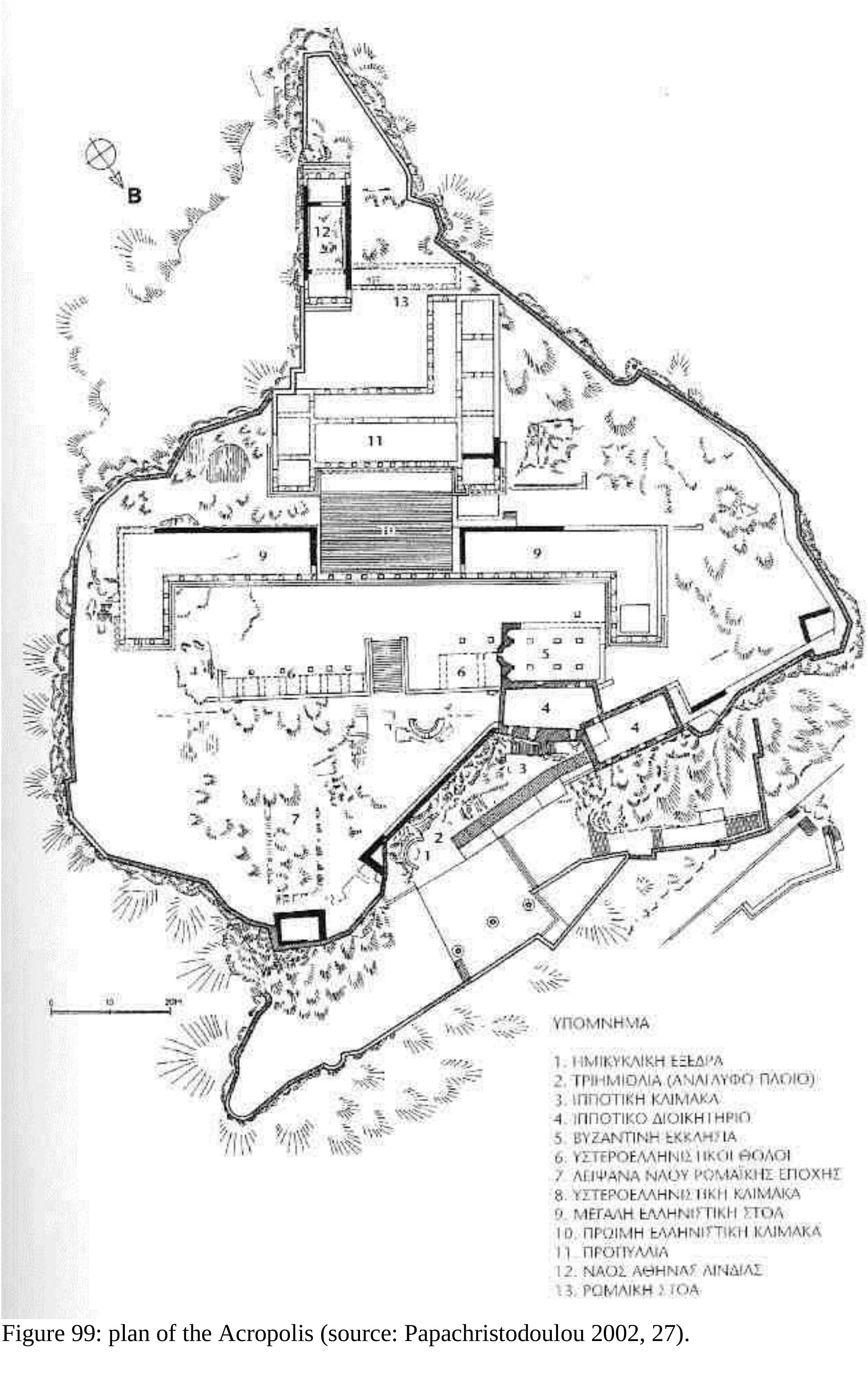

Figure 99: plan of the Acropolis (source: Papachristodoulou 2002, 27).

Figure 100a: Lindos, Rhodes. The archaeological site of the Acropolis
(source: Vacharopoulou -- personal photographs, 2003).

Figure 100b: Lindos, Rhodes. The archaeological site of the Acropolis
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Figure 100c: Lindos, Rhodes. The archaeological site of the Acropolis
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Figures 101a: Temple of Athena. View of the anastylosis works (source: Vacharopoulou -- personal photographs, 2003).

Figure 101b: Temple of Athena. View of the anastylosis works (source: Vacharopoulou -- personal photographs, 2003).

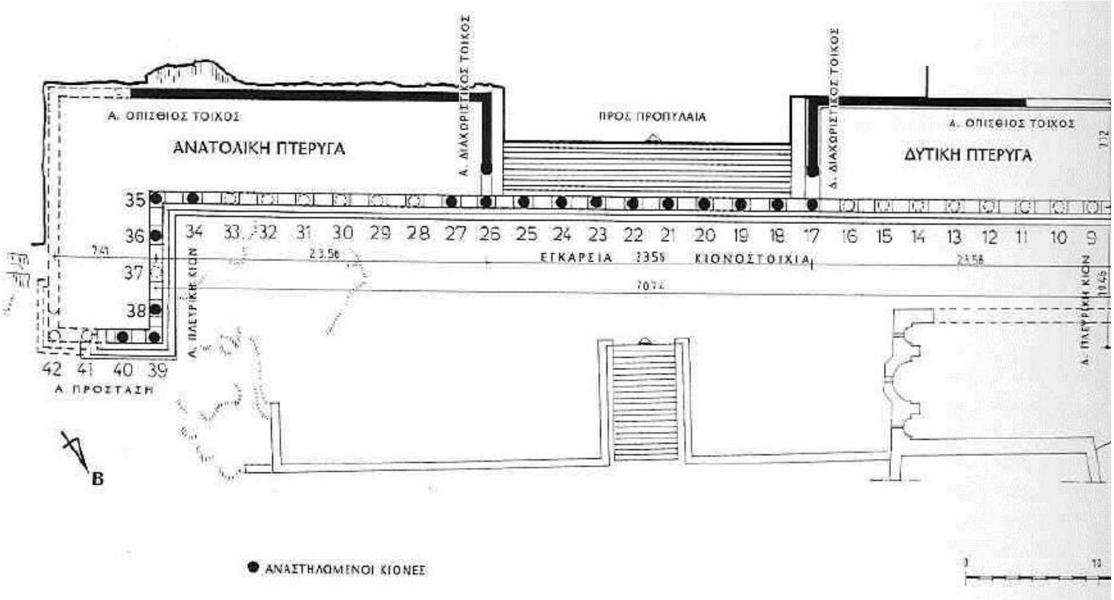


Figure 102: ground plan of the Stoa (1990) (source: Eleftheriou 2002h, 50).

Figure 103a: the Stoa during the excavations of 1903 (source: Eleftheriou 2002i, 34).

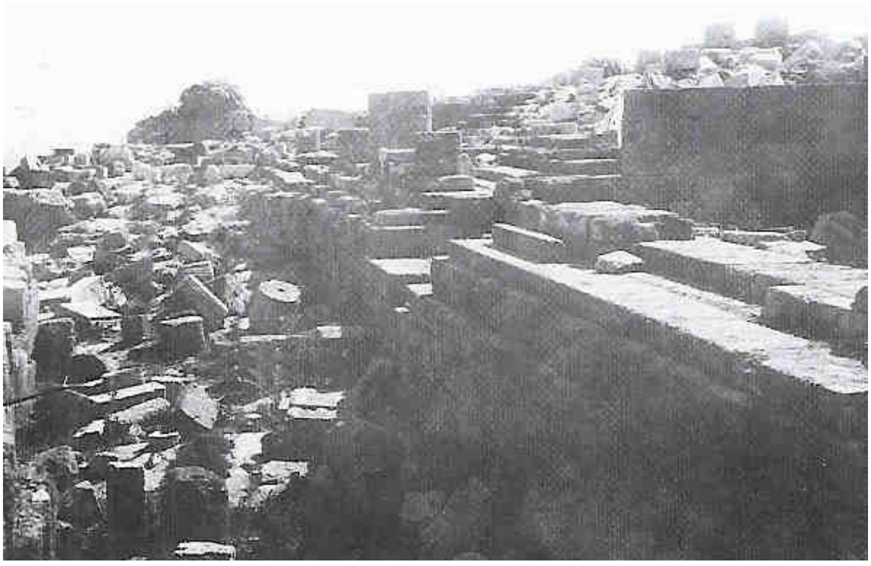


Figure 103b: the Stoa before the interventions of 1912 from the west (source: Eleftheriou 2002i, 38).

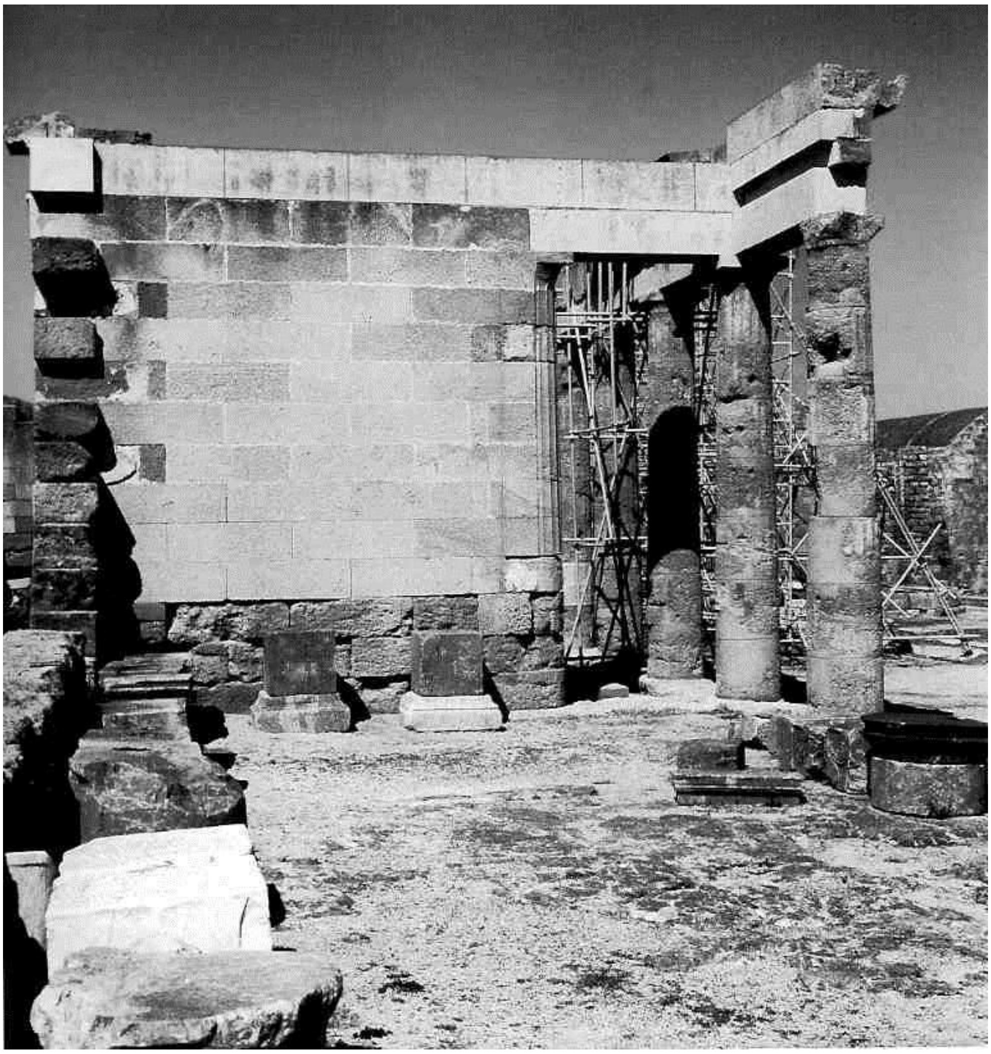


Figure 104: the separating east wall before the current interventions (1989)
(source: Eleftheriou 2002h, 57).

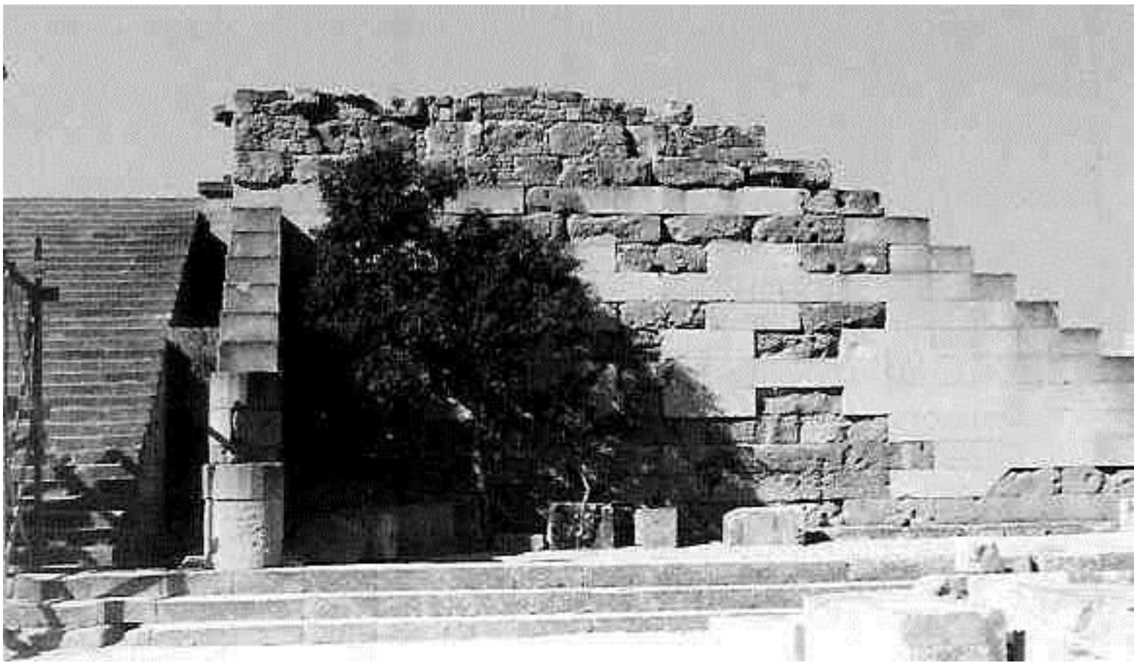


Figure 105: the back wall of the west side before the current interventions (1978)
(source: Eleftheriou 2002h, 81).

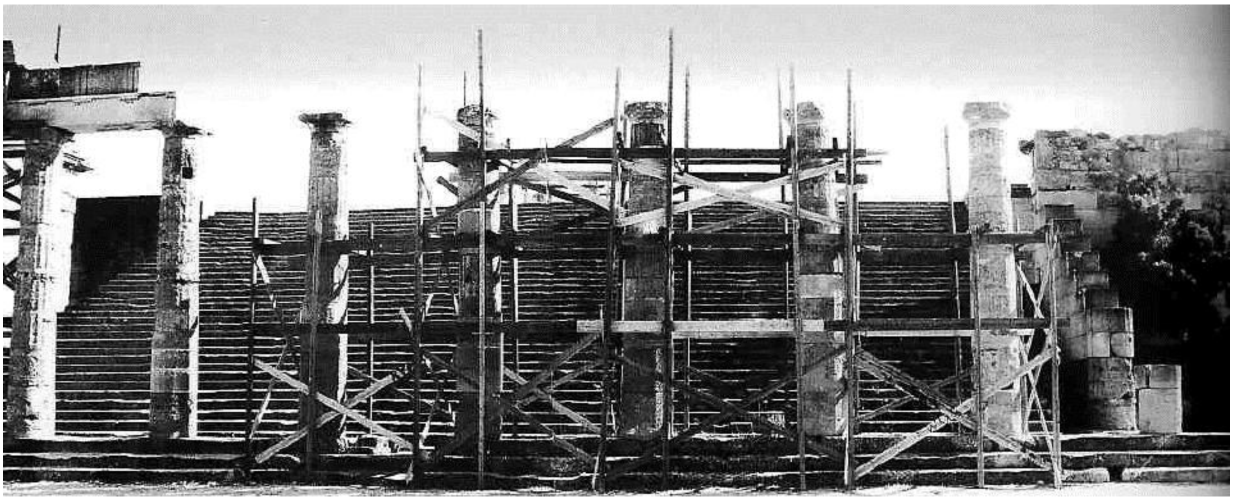


Figure 106a: the free part of the transverse colonnade before the intervention (1978)
(source: Eleftheriou 2002a, 116).

Figure 106b: the free part of the transverse colonnade after the intervention (1997)
(source: Eleftheriou 2002a, 116).

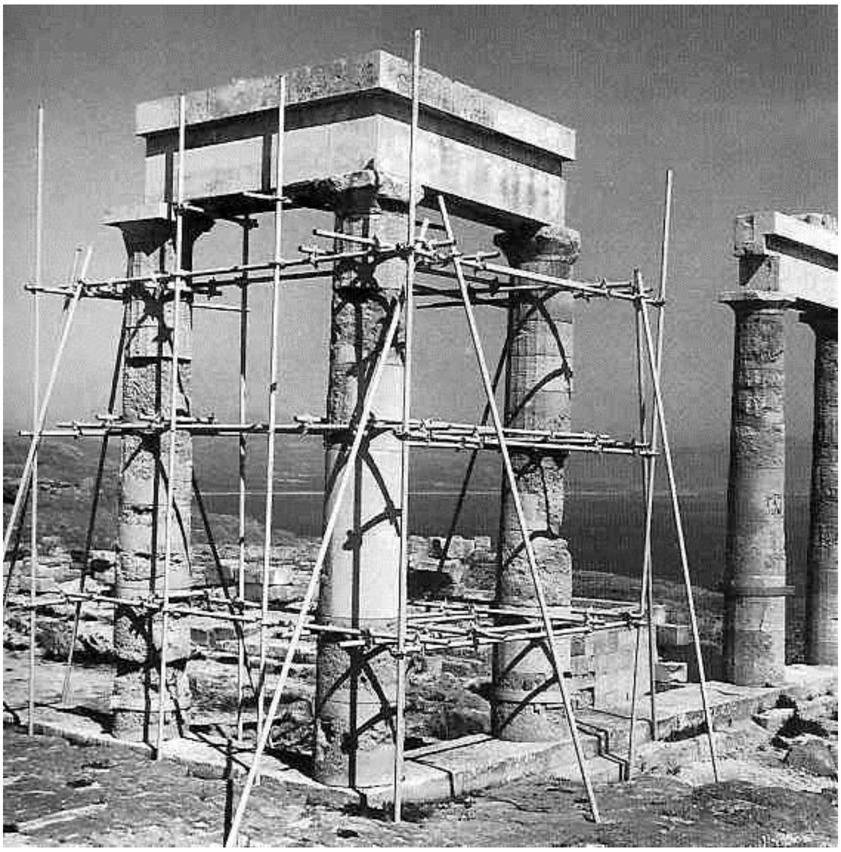


Figure 107a: the east corner of the Stoa before the intervention (1989) (source: Eleftheriou 2002a, 123).

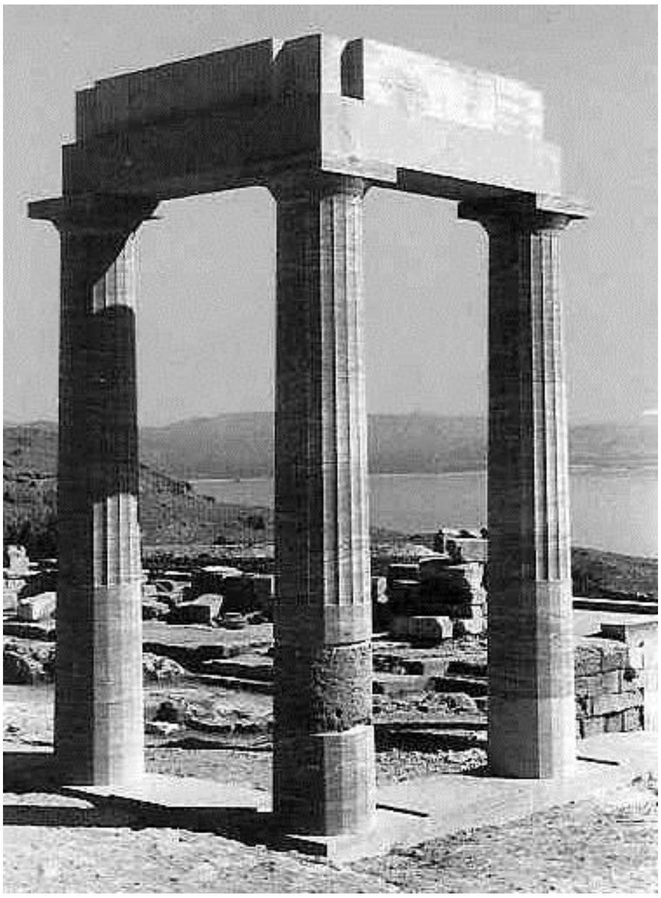


Figure 107b: the east corner of the Stoa after the intervention (1998) (source: Eleftheriou 2002a, 123).

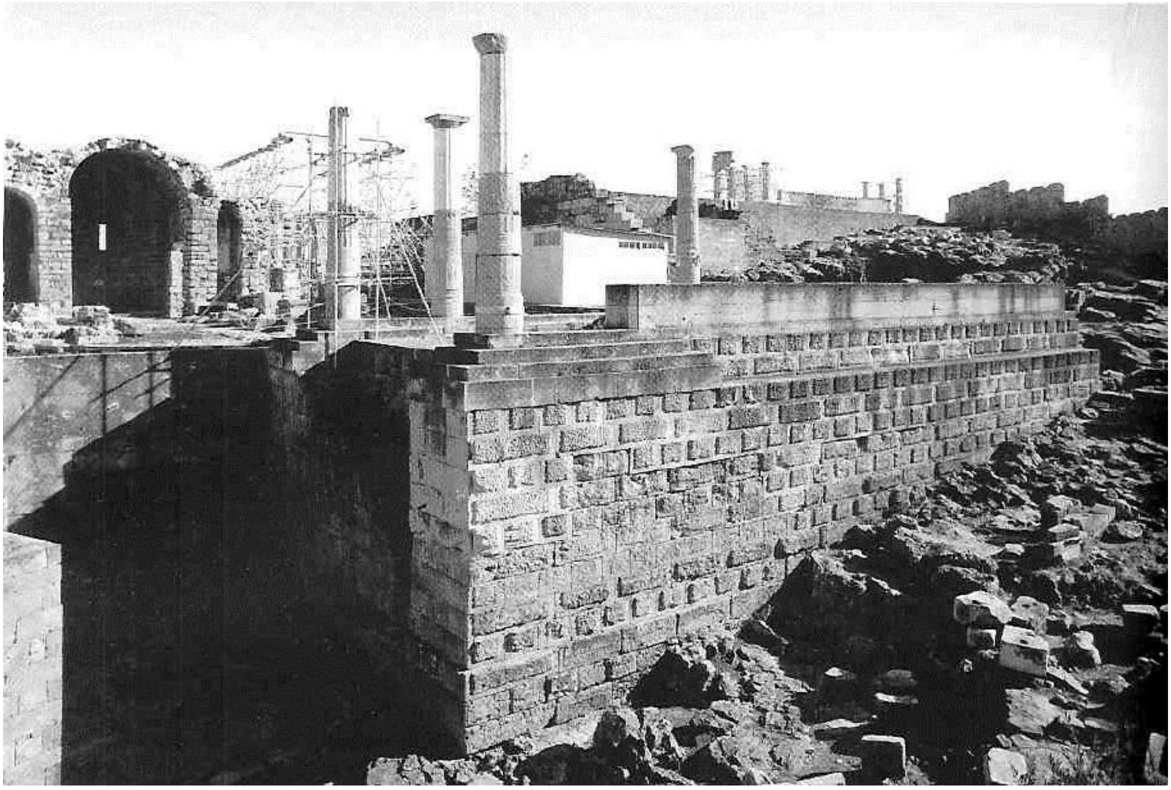


Figure 108a: the west side of the Stoa before the intervention (1989)
(source: Eleftheriou 2002a, 136).

Figure 108b: the west side of the Stoa after the intervention (2001)
(source: Eleftheriou 2002a, 136).

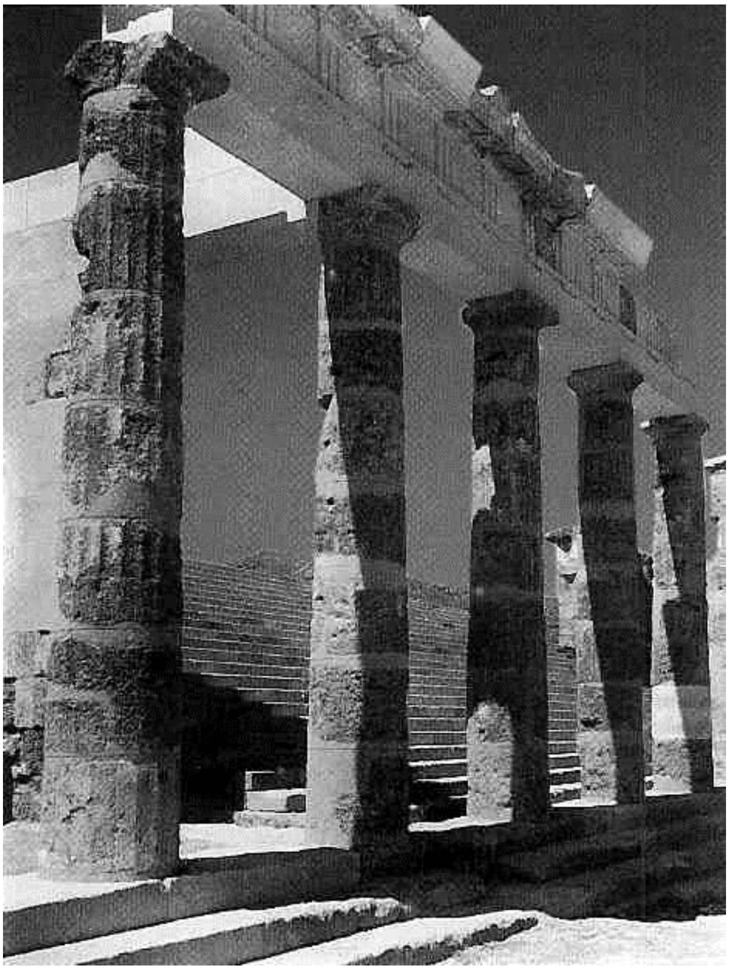


Figure 109: the Stoa after the Italian restoration (1938)
(source: Pikoula and Papadimitriou 2002b, 143).

Figure 110: the column of the Stoa ready to fall apart (1972)
(source: Eleftheriou 2002i, 46).

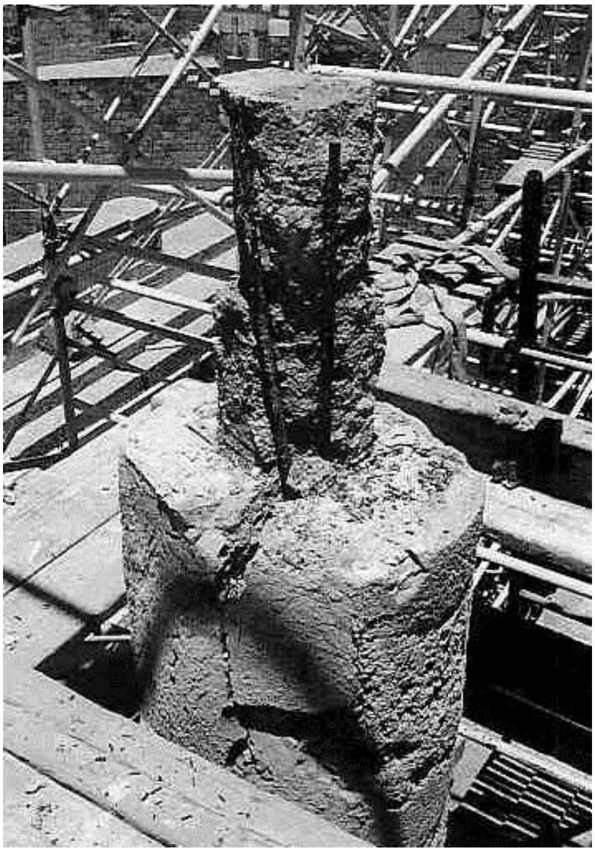


Figure 111a: nuclear of reinforced concrete revealed after the dismantling and removal of the new drum of the Italian anastylosis of 1938 (1998) (source: Pikoula 2002d, 99).

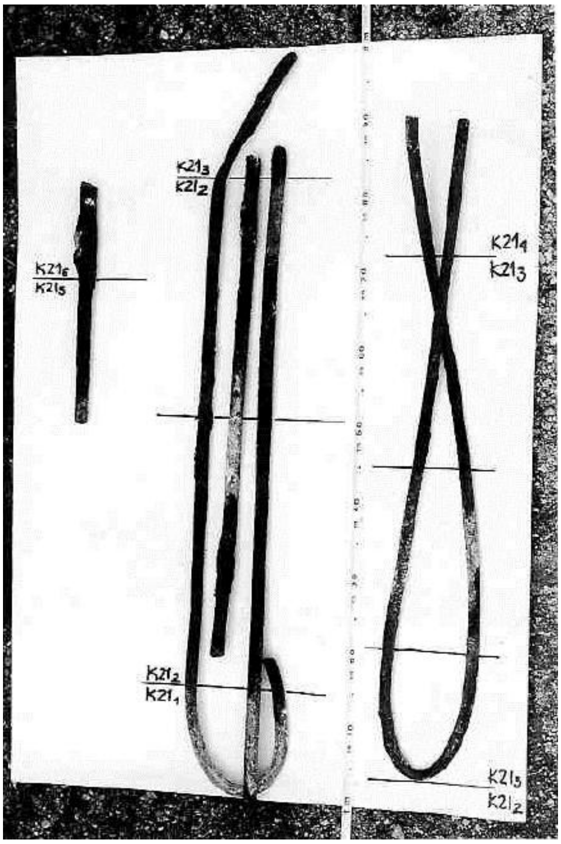


Figure 111b: metal reinforcements placed in column drums in past restorations (1995) (source: Pikoula 2002d, 101).

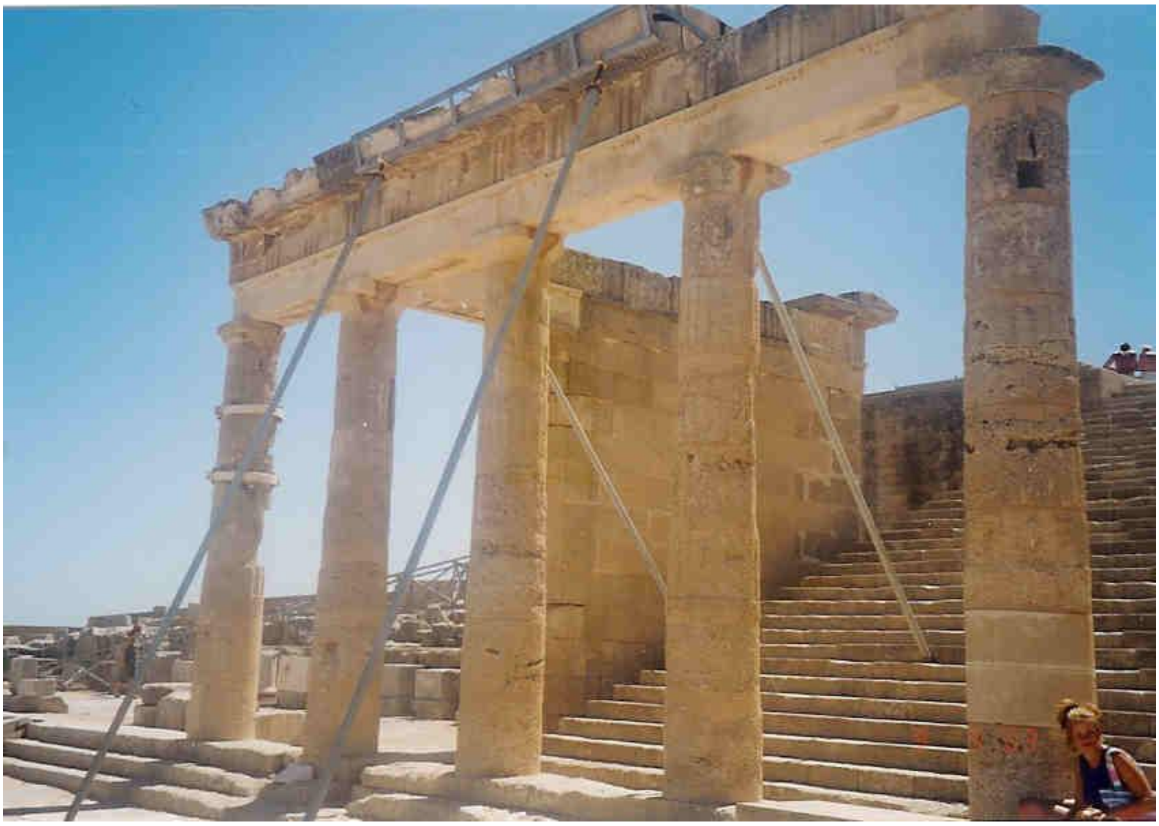


Figure 112a: view of the restored transverse colonnade of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 112b: view of the restored transverse colonnade of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 112c: view of the restored transverse colonnade of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 113a: view of the restored stoa and the east separating wall
(source: Vacharopoulou -- personal photographs, 2003).

Figure 113b: view of the restored stoa and the east separating wall
(source: Vacharopoulou -- personal photographs, 2003).

Figure 113c: view of the restored stoa and the east separating wall
(source: Vacharopoulou -- personal photographs, 2003).

Figure 113d: view of the restored stoa and the east separating wall
(source: Vacharopoulou -- personal photographs, 2003).

Figure 114: close view of the restored colonnade
(source: Vacharopoulou -- personal photographs, 2003).

Figure 115a: the work-site near the stoa, inside the archaeological site
(source: Vacharopoulou -- personal photographs, 2003).

Figure 115b: the work-site near the stoa, inside the archaeological site
(source: Vacharopoulou -- personal photographs, 2003).

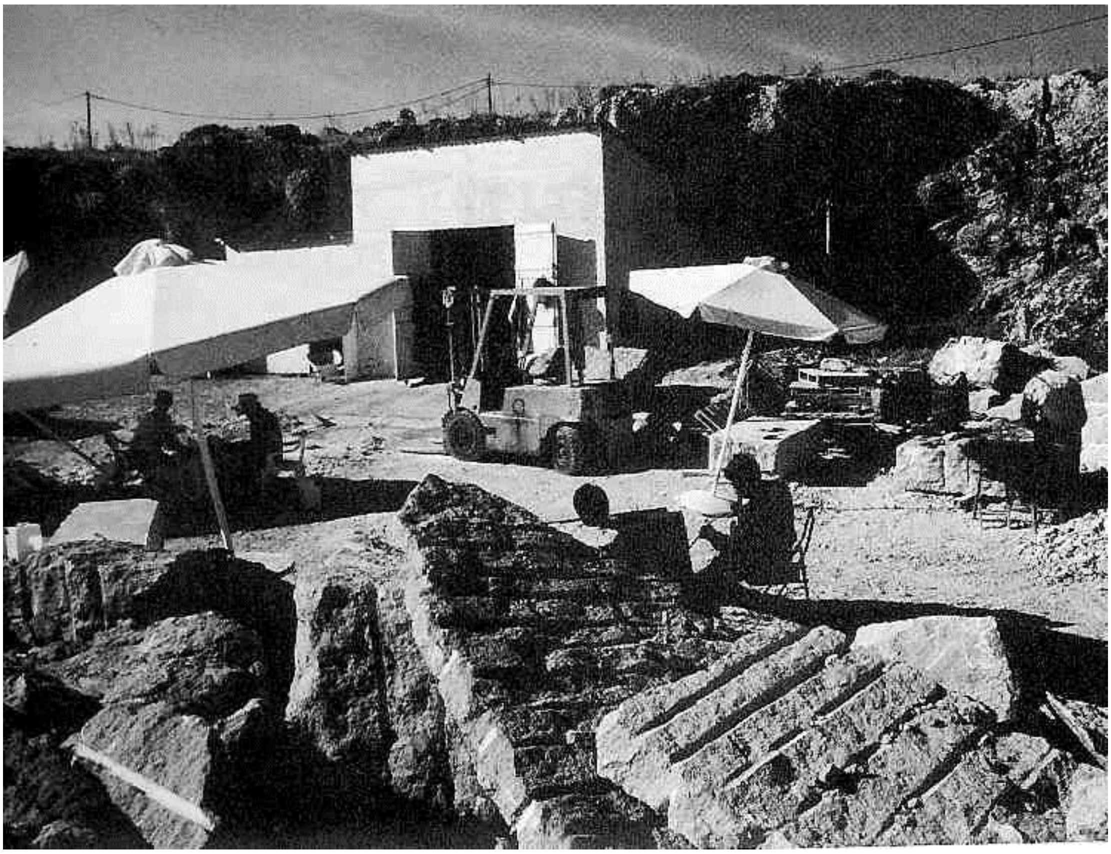


Figure 116: the work-site outside the archaeological site (1995)
(source: Pikoula 2002c, 185).

Figure 117: architectural members dispersed around the stoa (2003)
(source: Vacharopoulou -- personal photographs, 2003).

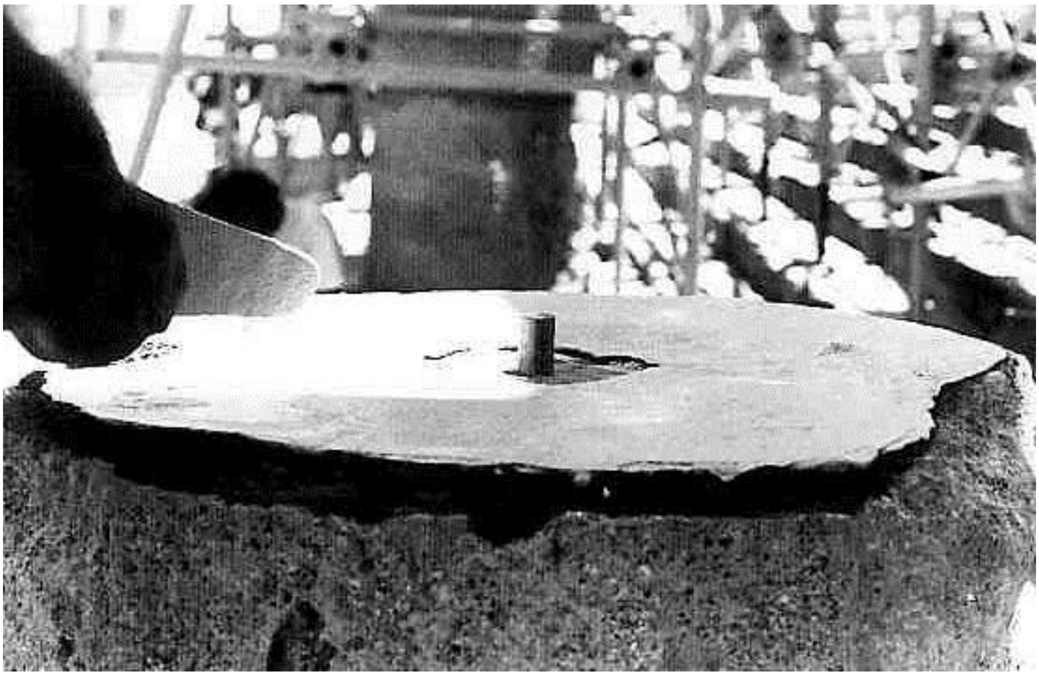


Figure 118a: putting mortar in a column drum to smooth the surface (1994)
(source: Pikoula and Papadimitriou 2002a, 169).

Figure 118b: detail of a column with a mortar plaster (1989)
(source: Eleftheriou 2002h, 50).

Figure 119: a drum formed from three non-belonging ancient fragments, after having been cleaned from concrete mortar (source: Eleftheriou 2002g, 94).

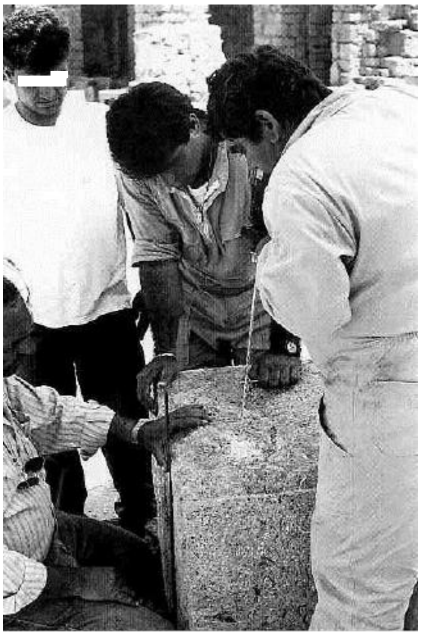


Figure 120a: reinforcement of ancient drums with titanium rods (1994) (source: Eleftheriou 2002f, 110).

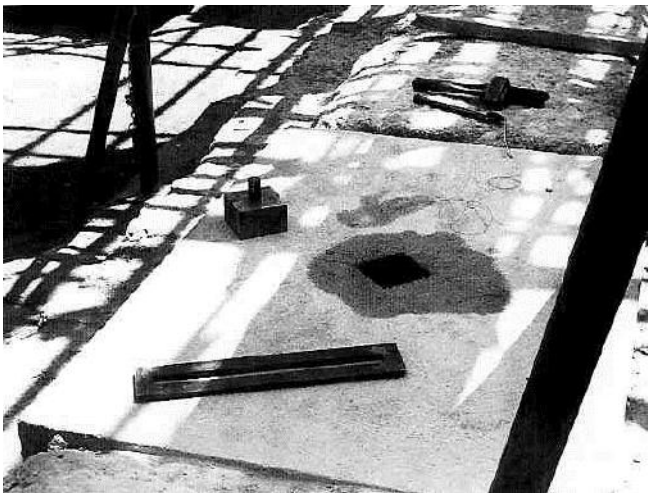


Figure 120b: placing a connecting joint in a column drum (1994) (source: Pikoula and Papadimitriou 2002a, 169).

Figure 121: anastylosis of columns (1999) (source: Eleftheriou 2002a, 139).

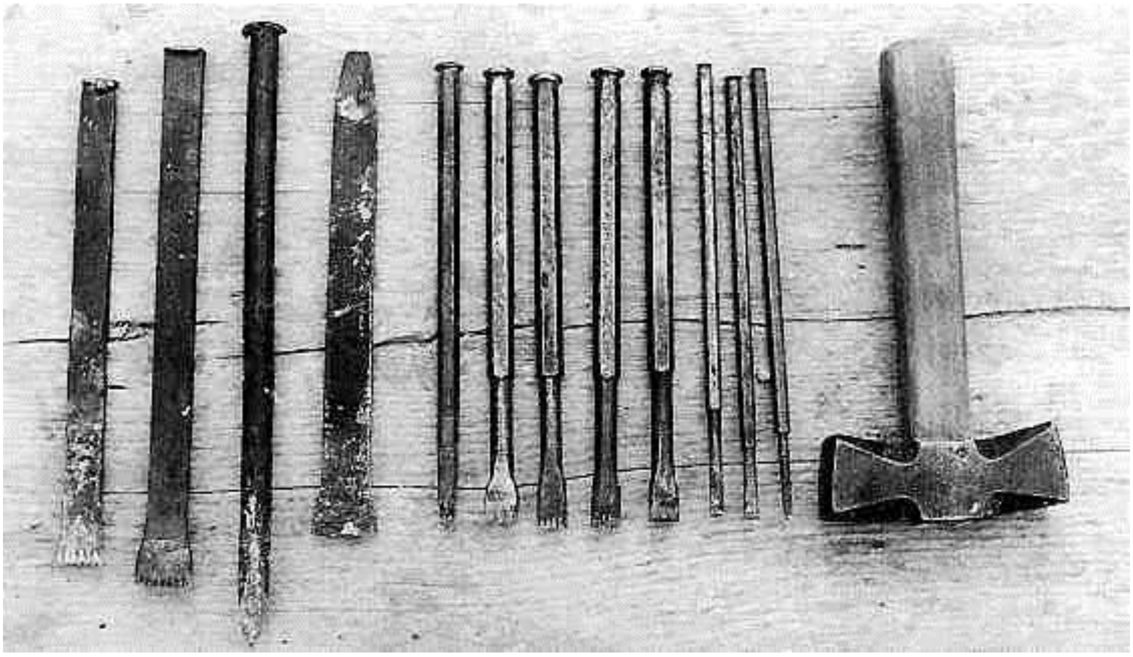


Figure 122: devices for working the stones (1999)
(source: Pikoula and Papadimitriou 2002a, 168).

Figure 123a: view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

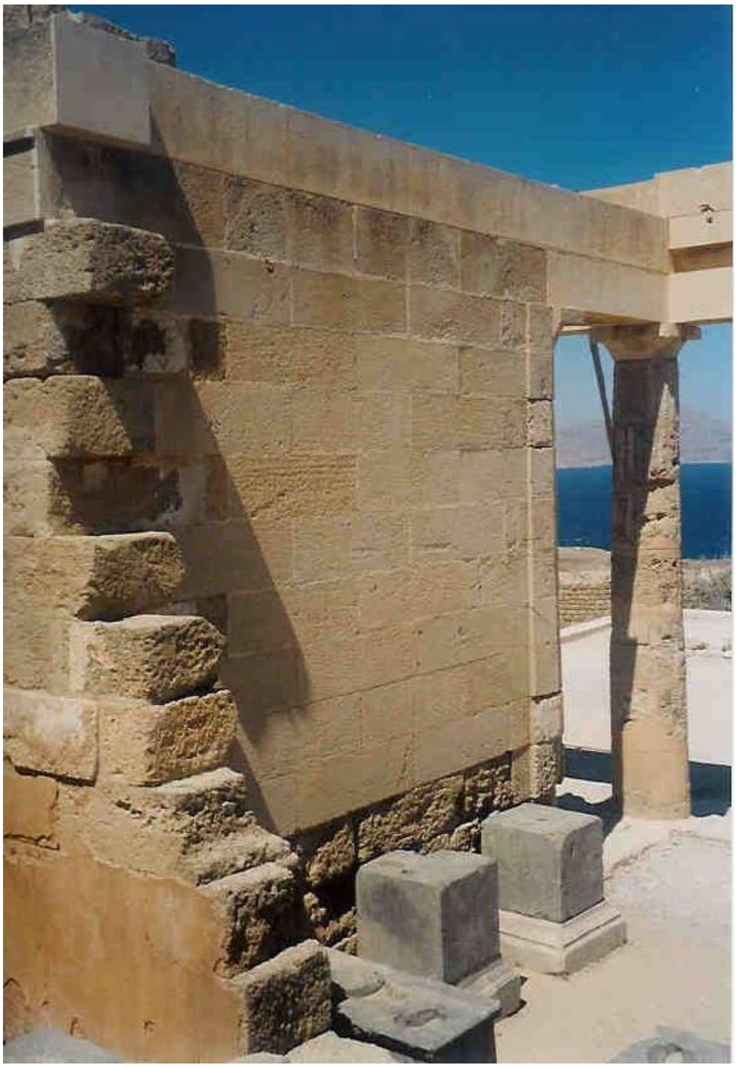


Figure 123b: close view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

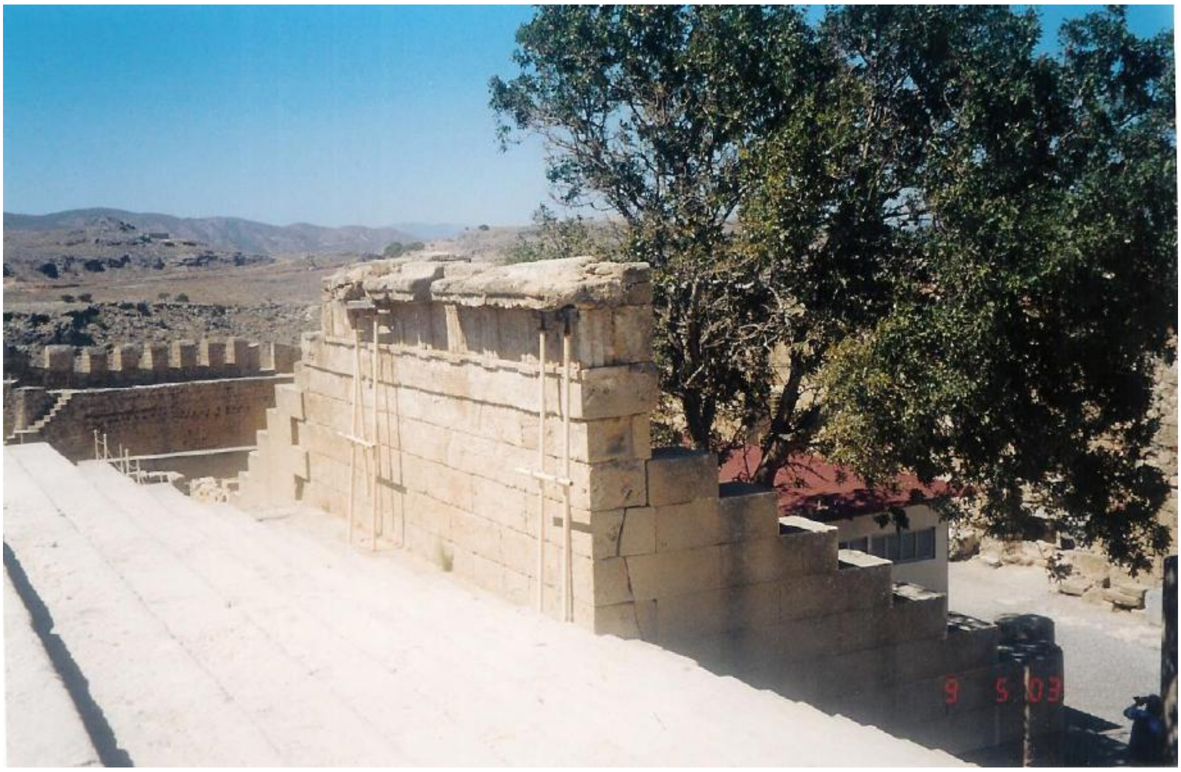


Figure 124: view of the restored west wall of the Stoa
(source: Vacharopoulou -- personal photographs, 2003).


Figure 125: view of the restored east wall of the Stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 126: view of the restored transverse colonnade of the Stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 127: view of the restored transverse colonnade and the restored east wall of the Stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 128a: view of the east side of the restored transverse colonnade of the Stoa (source: Vacharopoulou -- personal photographs, 2003).

Figure 128b: close view of the east side of the restored transverse colonnade and part of the restored east wall of the Stoa (source: Vacharopoulou -- personal photographs, 2003).

Figure 129: view of the transverse colonnade of the restored stoa (2003)
(source: Vacharopoulou -- personal photographs, 2003).

Figure 130: view of the east corner of the restored stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 131: view of the transverse colonnade and the east corner of the restored stoa
(source: Vacharopoulou -- personal photographs, 2003).

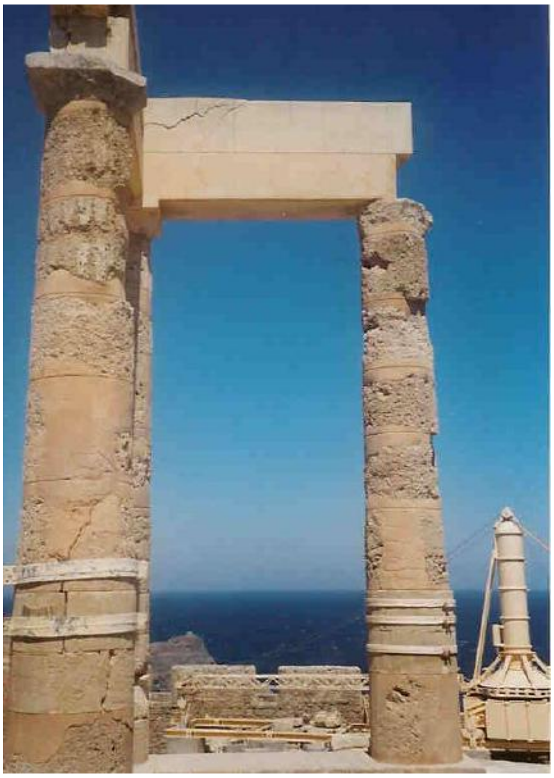


Figure 132a: view of the east corner of the restored stoa (source: Vacharopoulou – personal photographs, 2003).

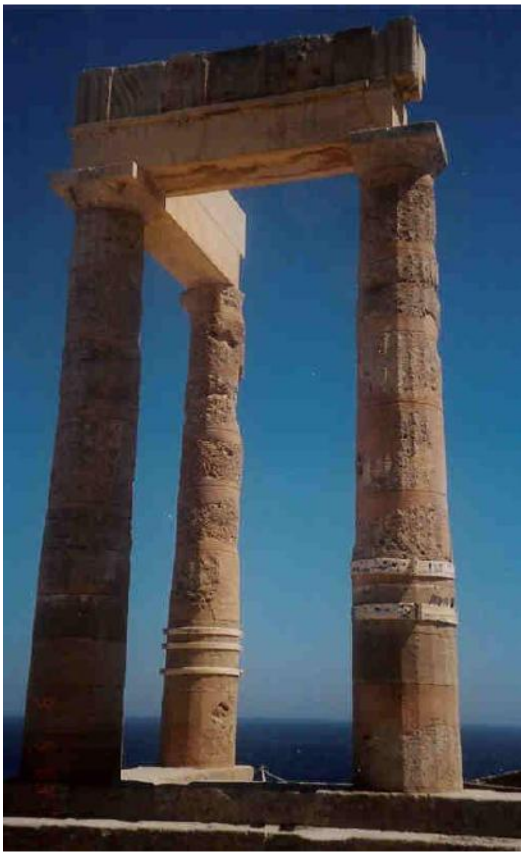


Figure 132b: view of the east corner of the restored stoa (source: Vacharopoulou -- personal photographs, 2003).

Figure 132c: view of the east corner of the restored stoa (source: Vacharopoulou -- personal photographs, 2003).

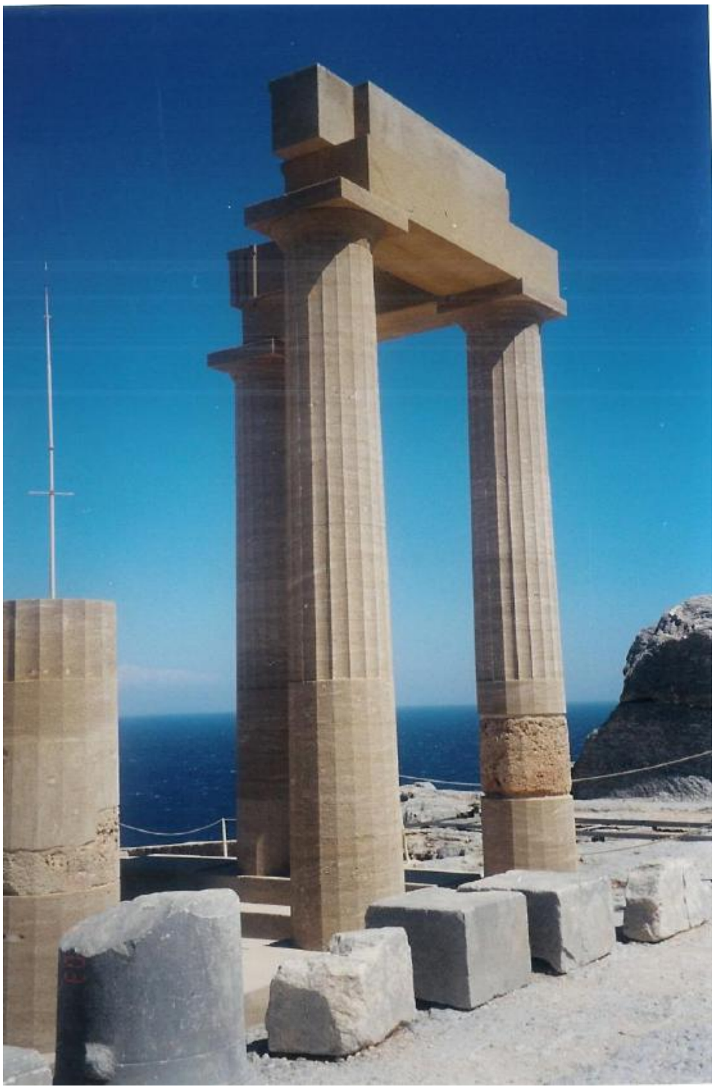


Figure 133a: close view of the east corner of the restored stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 133b: close view of the entablature east corner of the restored stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 133c: close view of the entablature east corner of the restored stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 134a: close view of the restored entablature of the transverse colonnade and the east wall of the stoa, showing the integration of new and original material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 134b: close view of the restored entablature of the transverse colonnade and the east wall of the stoa, showing the integration of new and original material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 134c: close view of the restored entablature of the transverse colonnade and the east wall of the stoa, showing the integration of new and original material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 135a: view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figure 135b: view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

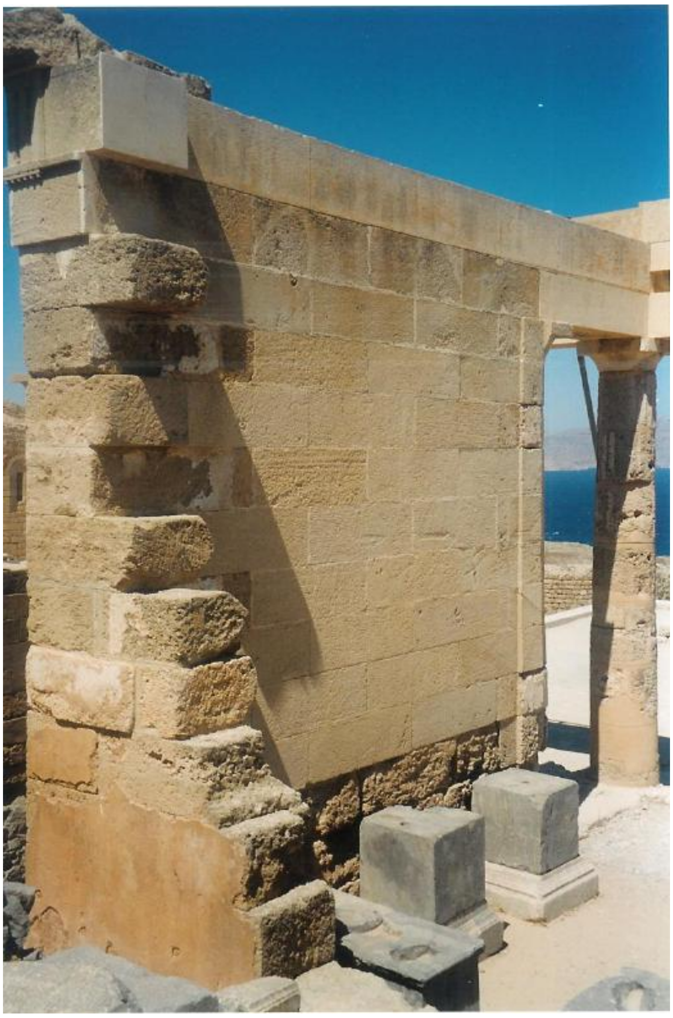


Figure 135c: view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

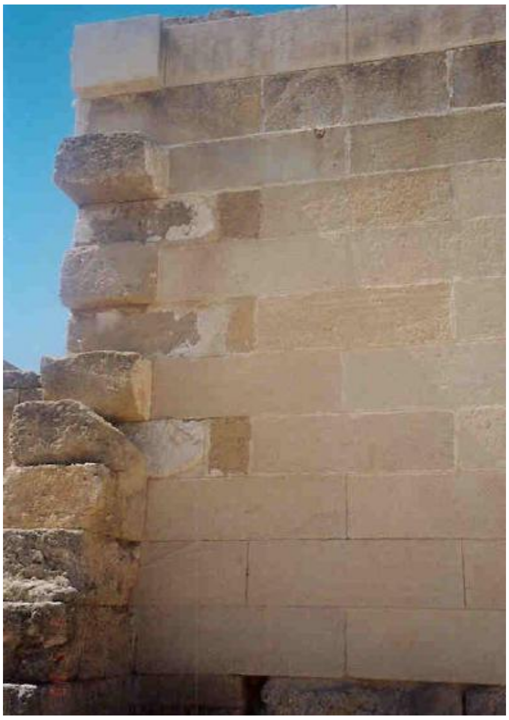


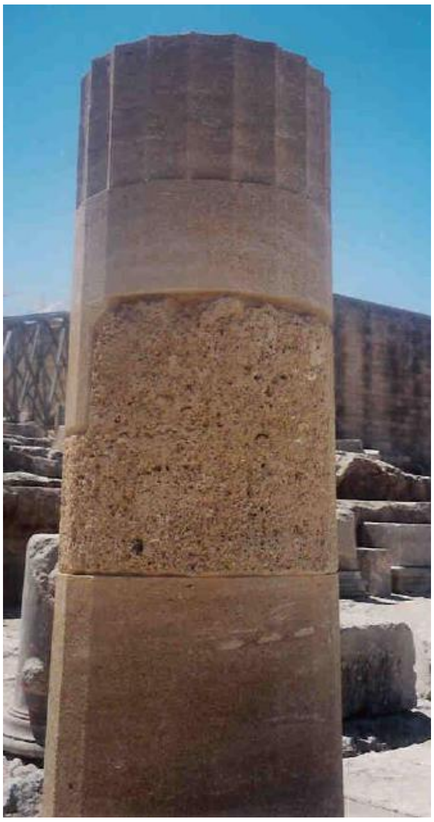
Figure 135d: view of the restored east wall of the stoa
(source: Vacharopoulou -- personal photographs, 2003).

Figures 136a, b: the east corner of the stoa that presents problems of structural stability (source: Vacharopoulou -- personal photographs, 2003).

Figure 136c: close view of the columns of the east corner of the stoa that present problems of structural stability (source: Vacharopoulou -- personal photographs, 2003).

Figures 137a, b: a column of the transverse colonnade of the stoa that presents problems of structural stability (source: Vacharopoulou -- personal photographs, 2003).

Figure 137c: columns of the transverse colonnade of the stoa that present problems of structural stability (source: Vacharopoulou -- personal photographs, 2003).



Figures 138a, b: close view of columns indicating integration of eroded drums with new ones (source: Vacharopoulou -- personal photographs, 2003).

Figure 138c: close view of columns indicating integration of eroded drums with new ones (source: Vacharopoulou -- personal photographs, 2003).

Figure 139a: close view of the entablature of the east corner of the stoa showing integration of badly preserved original material and new material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 139b: close view of the entablature and a column of the east corner of the stoa showing integration of badly preserved original material and new material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 140a: close view of the column and entablature of the transverse colonnade of the stoa (source: Vacharopoulou -- personal photographs, 2003)

Figure 140b: close view of the column and entablature of the transverse colonnade of the stoa (source: Vacharopoulou -- personal photographs, 2003)

Figures 141a, b: close view of columns indicating harmonious integration, yet differentiation between original and new material
(source: Vacharopoulou -- personal photographs, 2003).

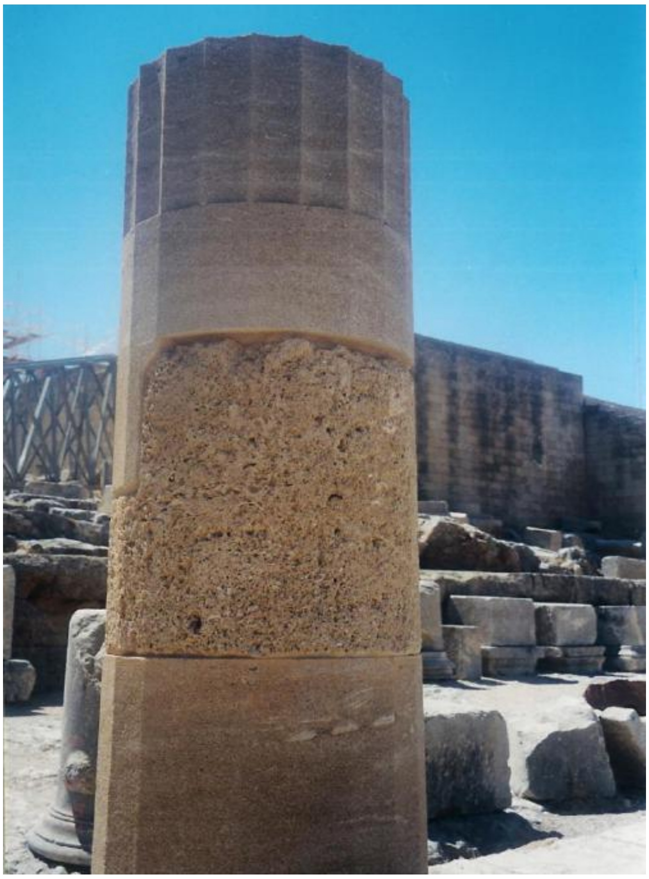


Figure 141c: close view of a column indicating harmonious integration, yet differentiation between original and new material
(source: Vacharopoulou -- personal photographs, 2003).

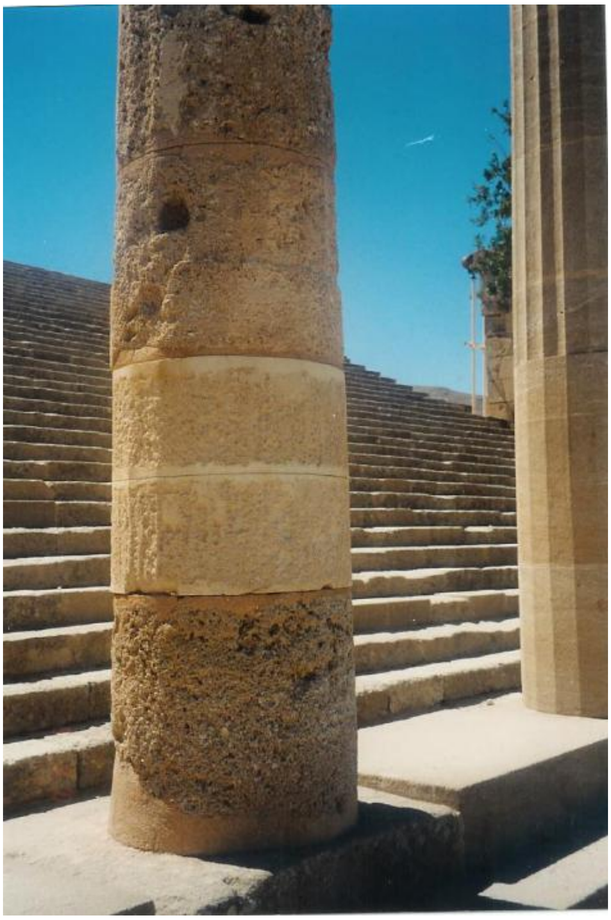


Figure 141d: close view of a column indicating harmonious integration, yet differentiation between original and new material (source: Vacharopoulou -- personal photographs, 2003).

Figure 141e: close view of a column indicating harmonious integration, yet differentiation between original and new material (source: Vacharopoulou -- personal photographs, 2003).

Figure 142: close view of columns indicating harmonious integration, yet differentiation between original and new material (source: Vacharopoulou -- personal photographs, 2003).

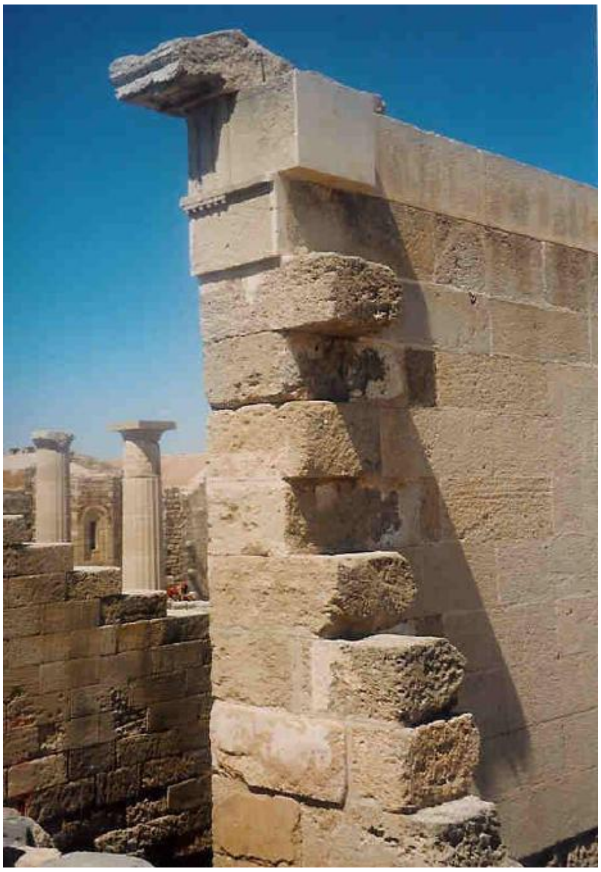


Figure 143a: view of the restored east wall of the stoa, indicating the compromise between preservation of form and limited possibility of reuse of original material
(source: Vacharopoulou -- personal photographs, 2003).

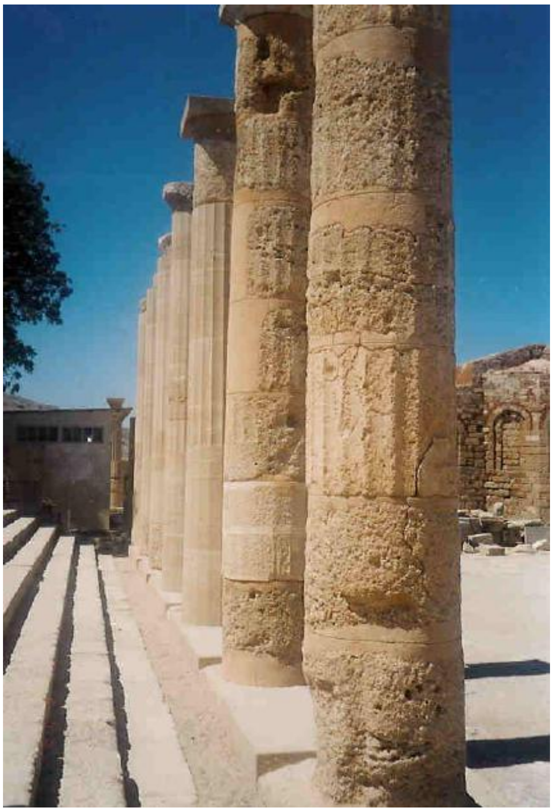


Figure 143b: view of the restored columns of the transverse colonnade of the stoa, indicating the compromise between preservation of form and limited possibility of reuse of original material (source: Vacharopoulou -- personal photographs, 2003).

Figure 144a: sign on the lower part of a column with the name of the monument (source: Vacharopoulou -- personal photographs, 2003).

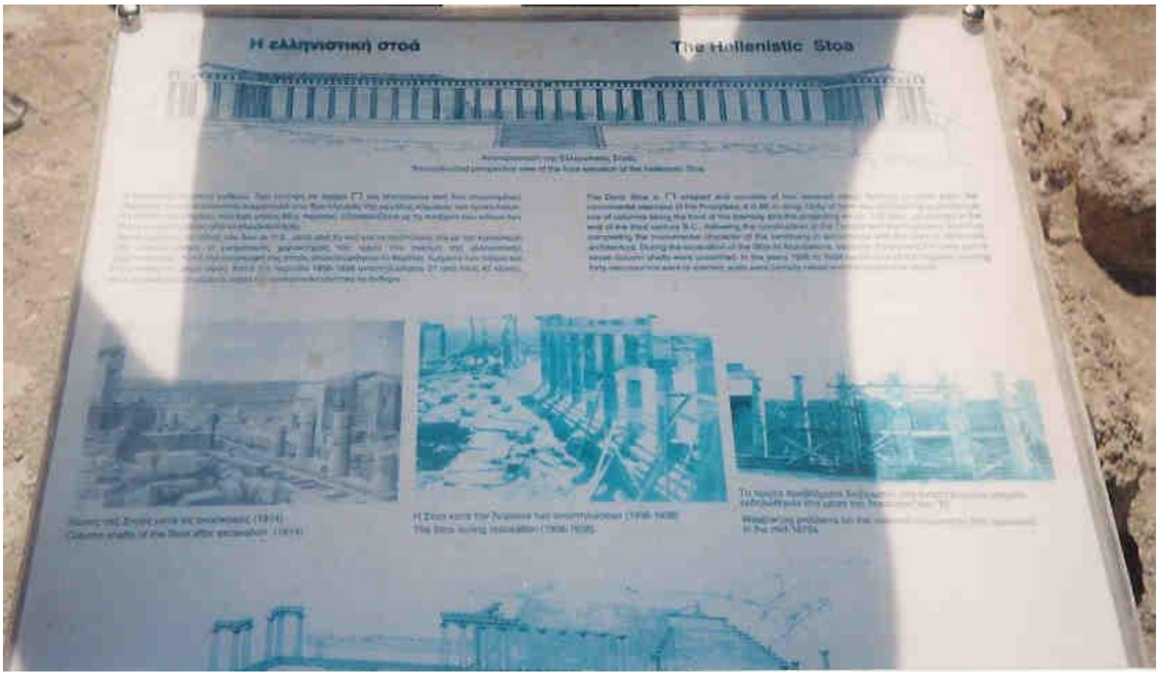


Figure 144b: notice-board on the site with information on the Hellenistic stoa (source: Vacharopoulou -- personal photographs, 2003).

Figure 145a: View of the left vault, inside which structural members not used in the anastylosis are exhibited (source: Vacharopoulou -- personal photographs, 2003).

Figure 145b: View of the right vault, inside which structural members not used in the anastylosis are exhibited (source: Vacharopoulou -- personal photographs, 2003).

Figure 146a: Detailed information on the stoa
(source: Vacharopoulou -- personal photographs, 2003).

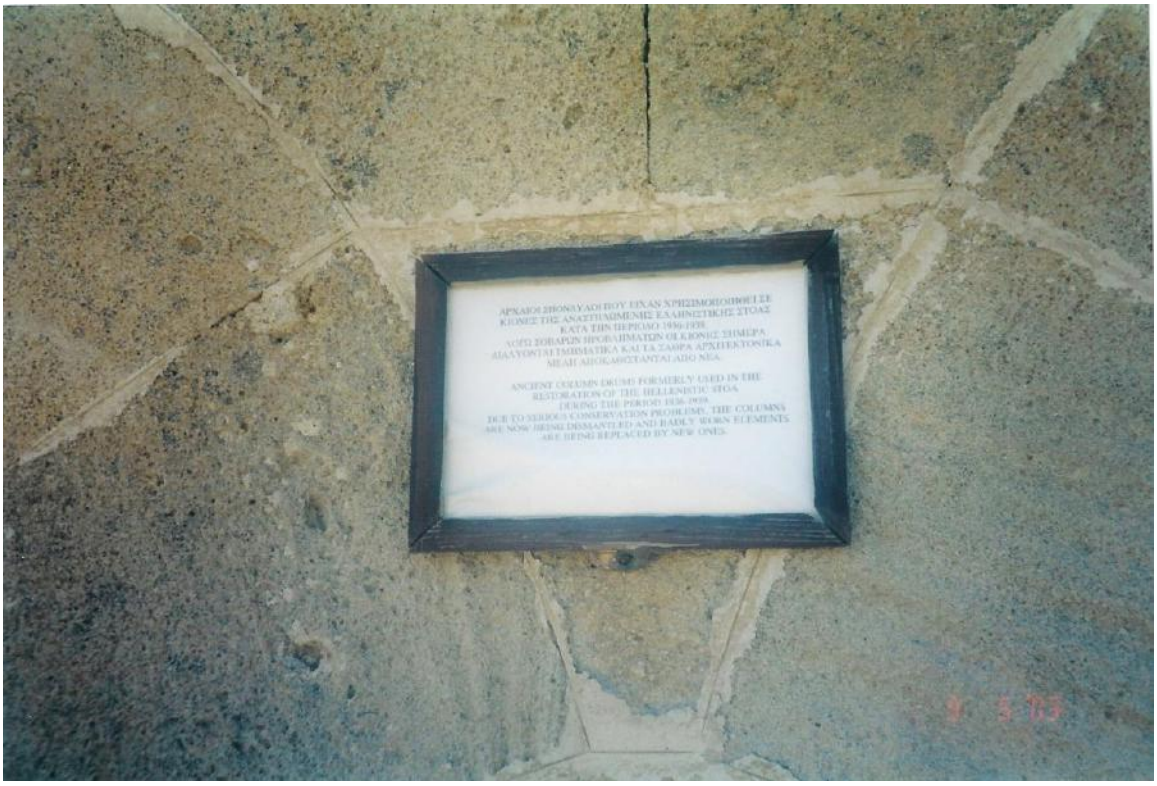


Figure 146b: Inscription with information on the stored structural members
(source: Vacharopoulou -- personal photographs, 2003).

Figure 147a: View of the stored structural and architectural members that are not used in the anastylosis of the stoa (source: Vacharopoulou -- personal photographs, 2003).

Figure 147b: View of the stored structural and architectural members that are not used in the anastylosis of the stoa (source: Vacharopoulou -- personal photographs, 2003).

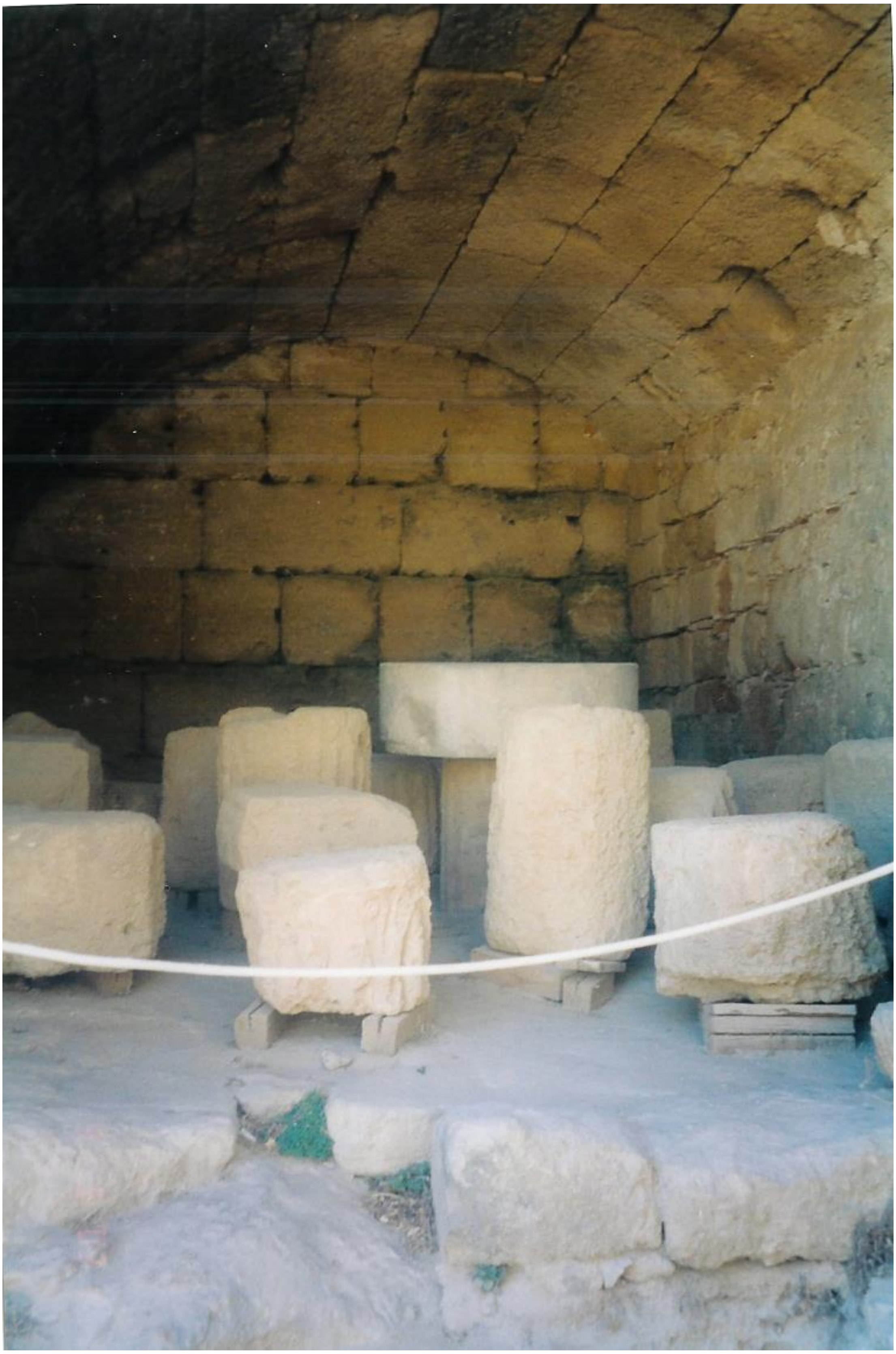


Figure 147c: View of the stored structural and architectural members that are not used in the anastylosis of the stoa (source: Vacharopoulou -- personal photographs, 2003).

TURKEY

Figure 148: Map of Turkey (source: Lonely Planet 2005).

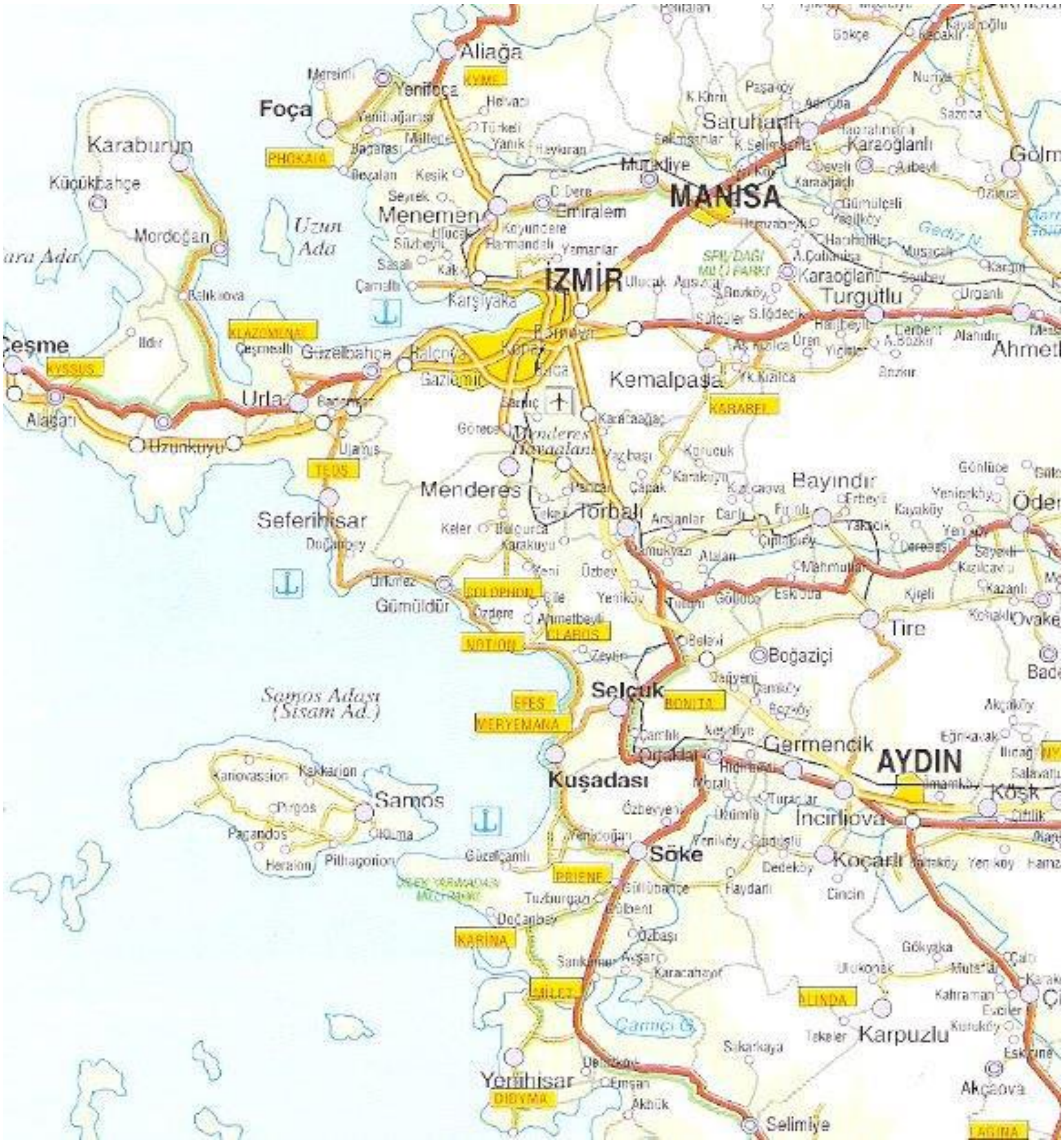


Figure 149: map of the Aegean coast of Turkey, showing the location of Ephesus (source: Sahiloglu 1997, 2).

Figure 150: aerial view of the archaeological site of Ephesus
(source: Hueber 1997, 18).

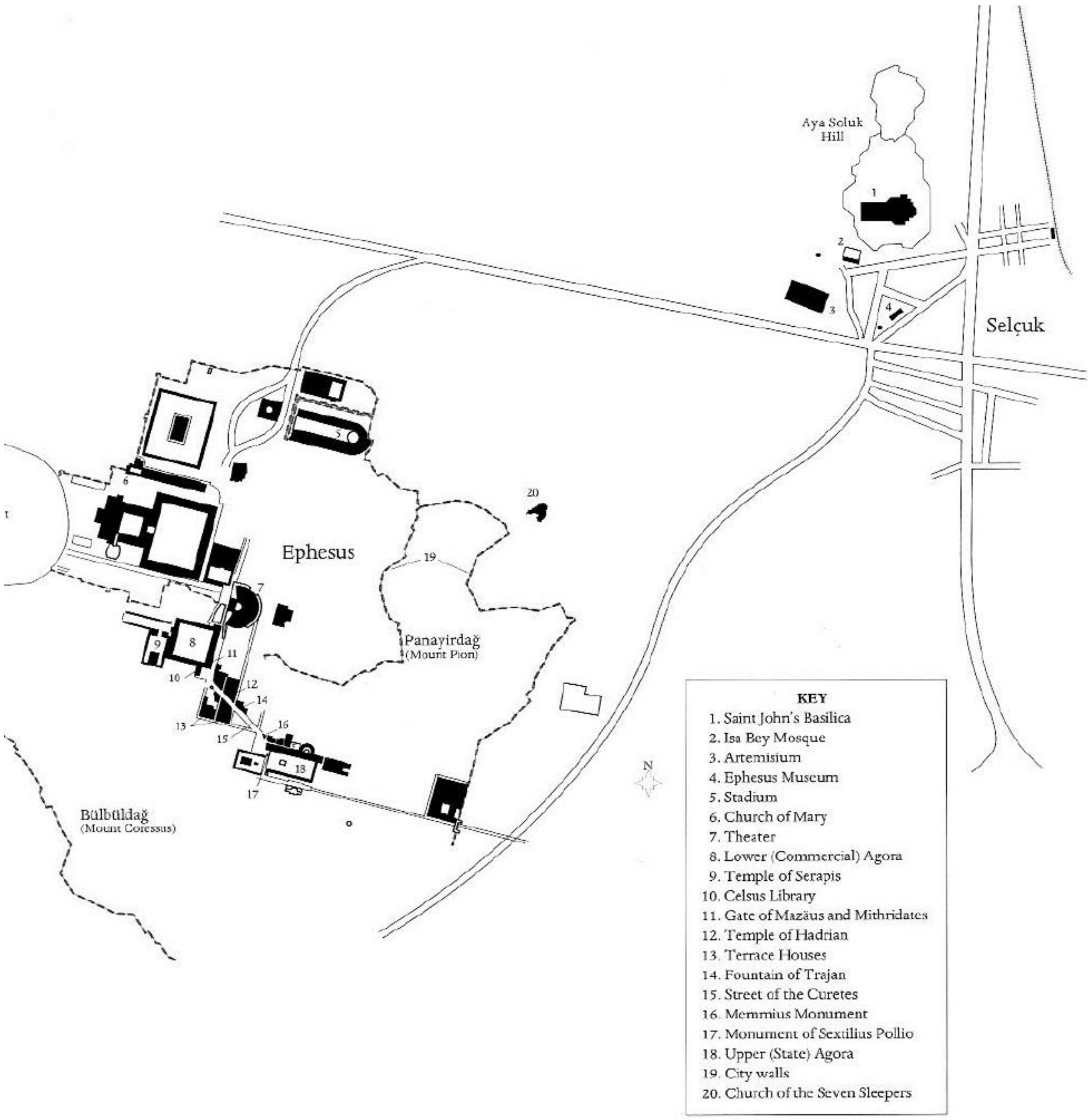


Figure 151: plan of Ephesus and its monuments
(source: Demas 1997a, 129).

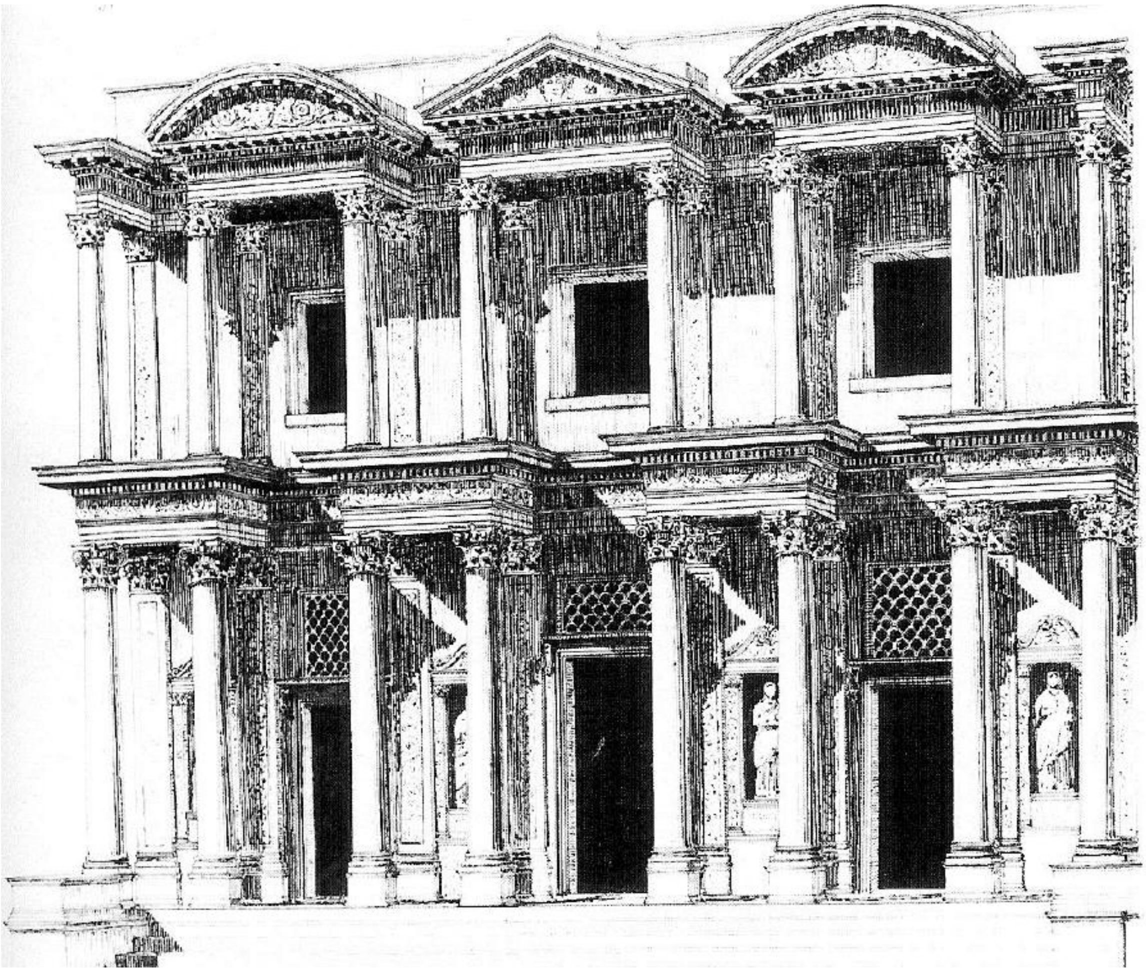


Figure 152: graphic reconstruction of the façade of the Celsus library by Wilberg (source: Wiplinger and Wlach 1996, 31).

Figure 153: the Celsus Library during excavation and removal of the Parthian frieze (1903) (source: Demas 1997a, 137).

Figure 154: South gate and Celsus library being unearthed (1903)
(source: Wiplinger and Wlach 1996, 30).

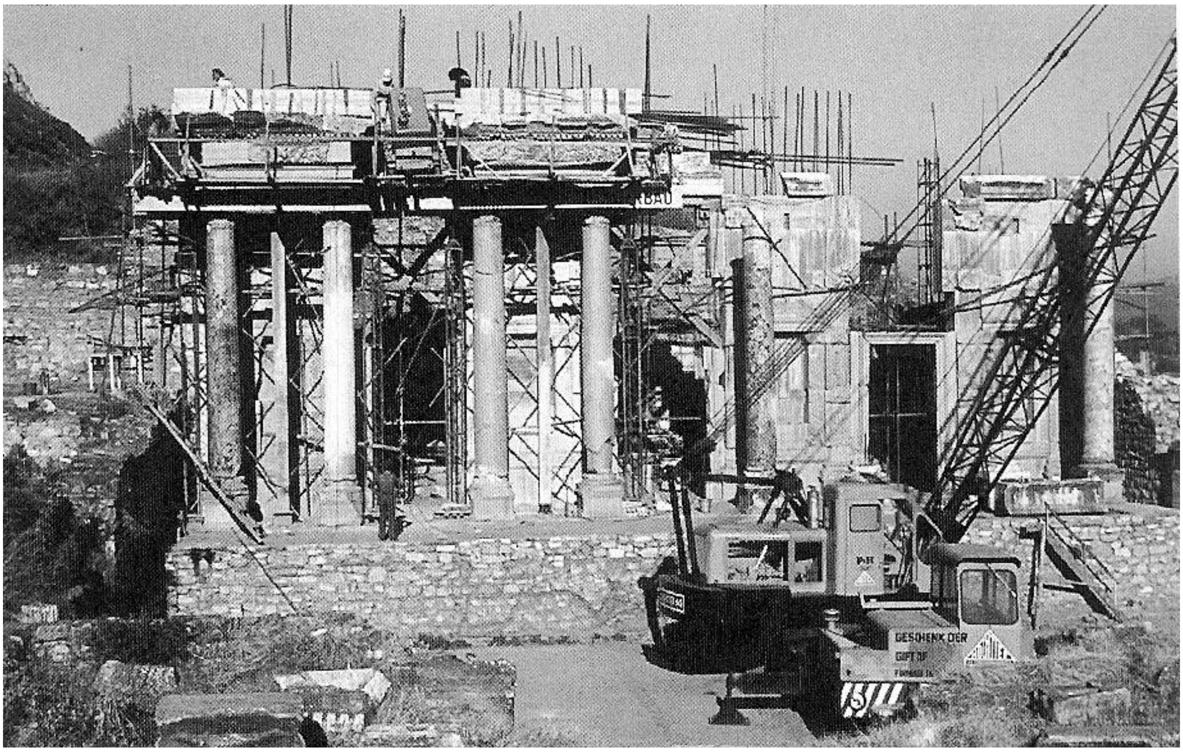


Figure 155: erection of the south ground floor architrave (1975)
(source: Wiplinger and Wlach 1996, 124).

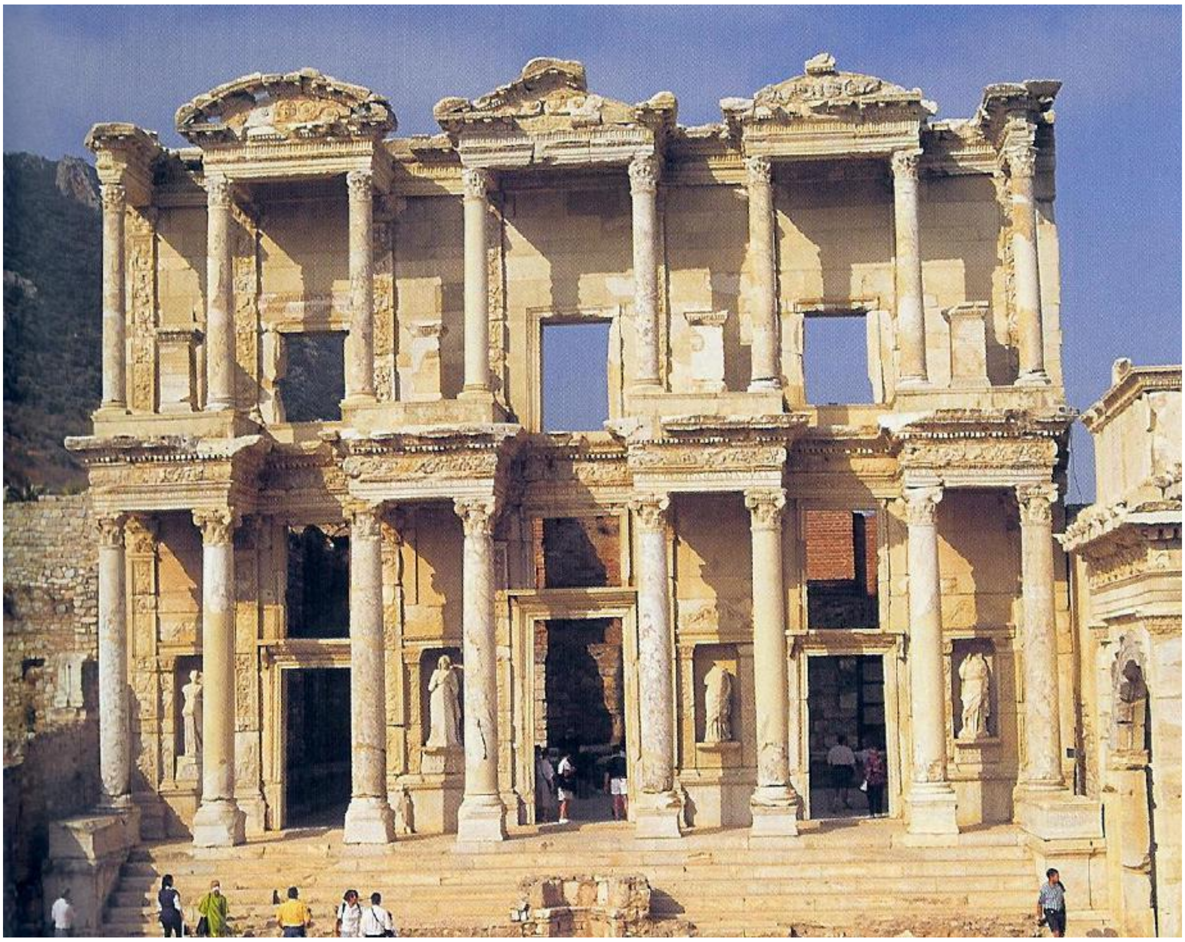


Figure 156a: the Library of Celsus after the anastylosis
(source: de la Torre 1997, 91).

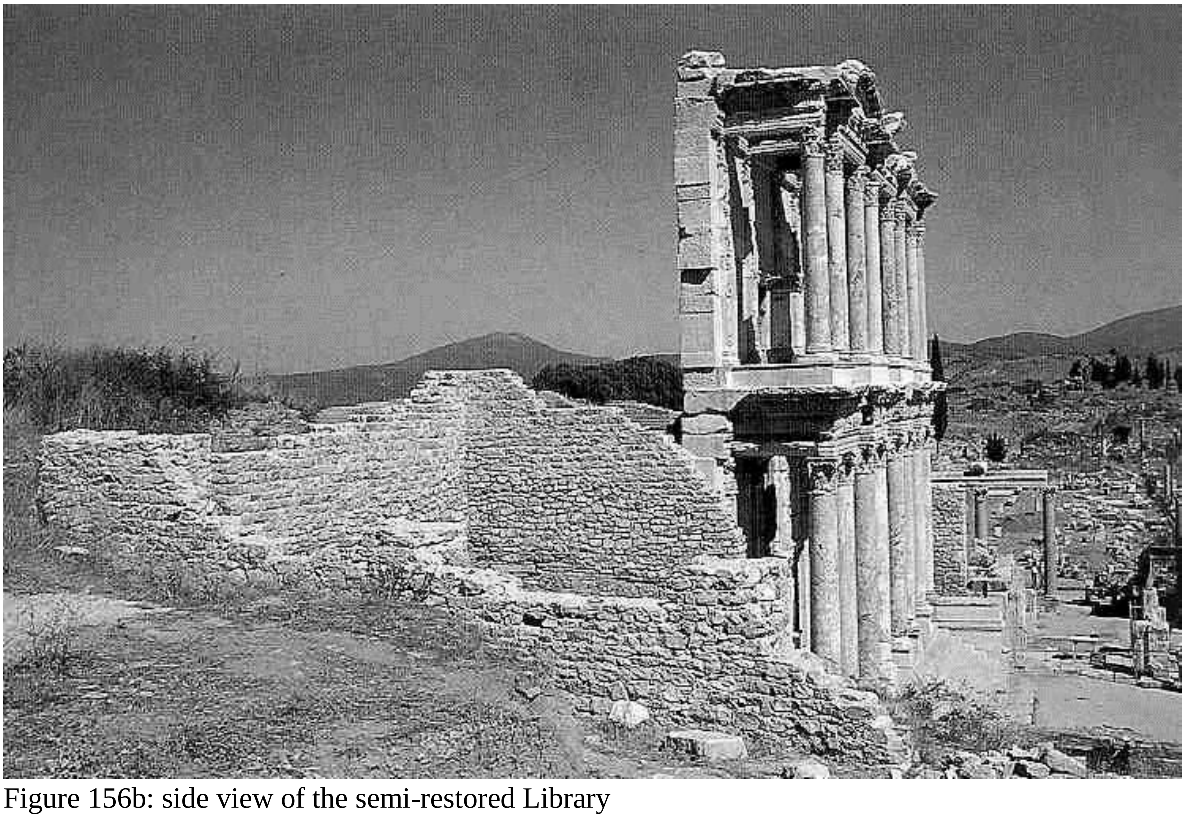


Figure 156b: side view of the semi-restored Library
(source: Schmidt 1993, 294).

Figure 157a: the façade of the Library after the anastylosis
(source: Vacharopoulou -- personal photographs, 2003).

Figure 157b: the restored interior of the Library
(source: Vacharopoulou -- personal photographs, 2003).

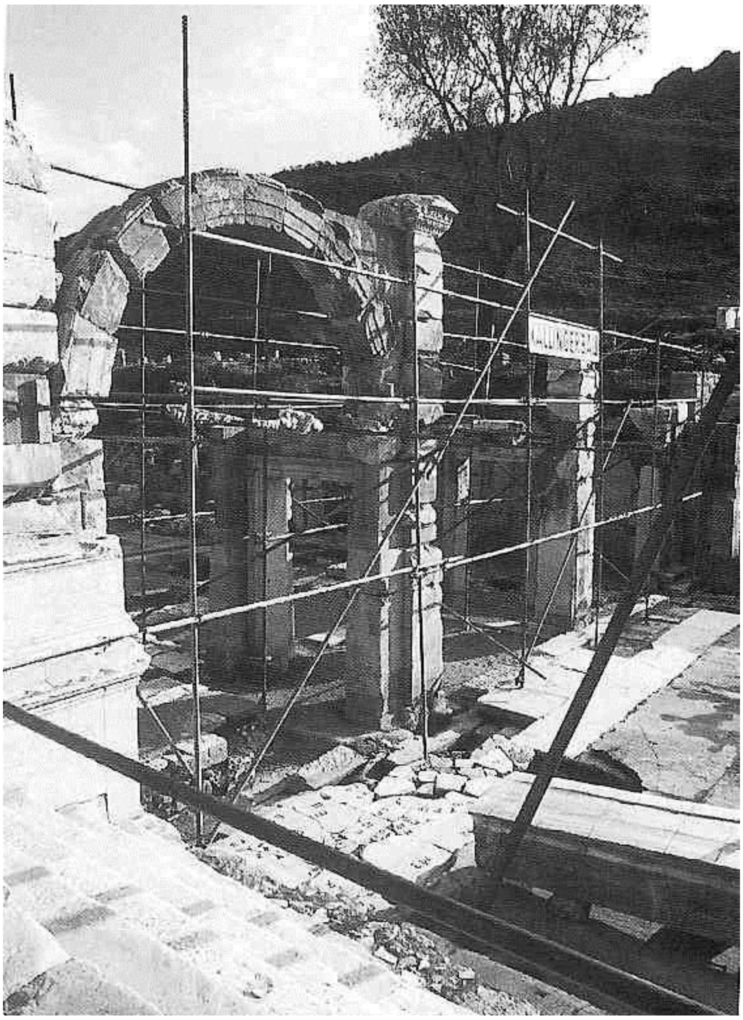


Figure 158a: start of the re-erection of the Mazaeus-Mithridates Gate (1980)
(source: Wiplinger and Wlach 1996, 127).

Figure 158b: the Gate of Mazaeus and Mithridates after the anastylosis (2003)
(source: Vacharopoulou -- personal photographs, 2003).

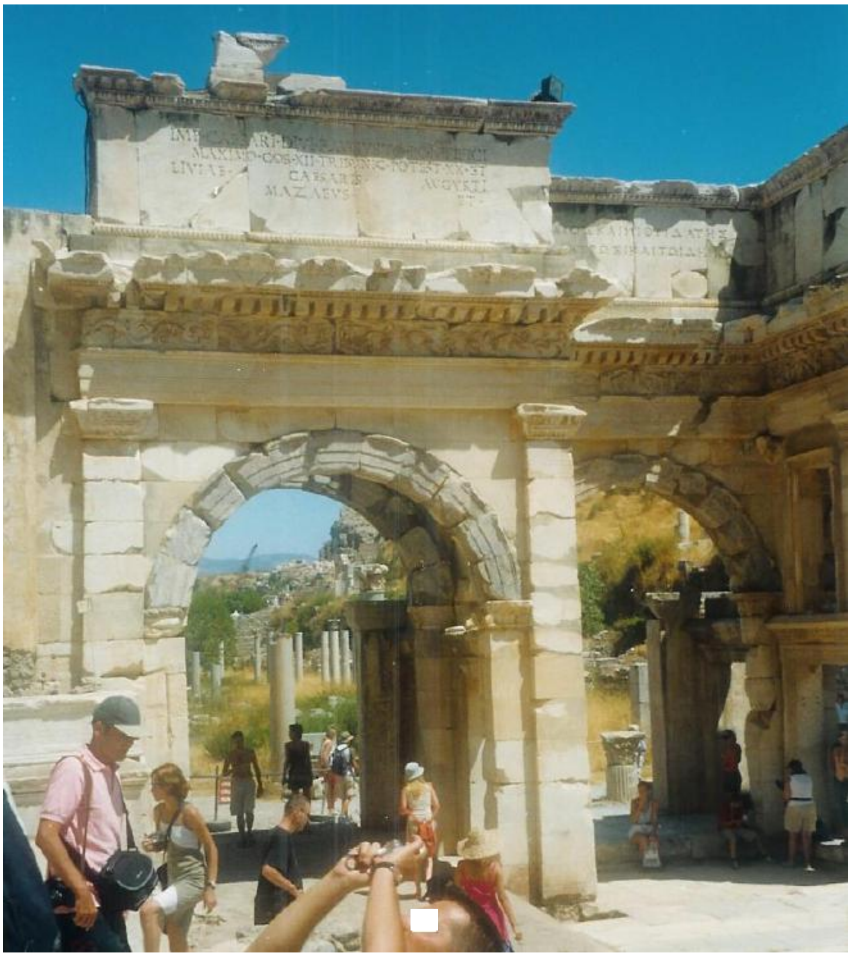


Figure 158c: The Gate of Mazaeus and Mithridates after the anastylosis
(source: Vacharopoulou -- personal photographs, 2003).

Figure 158d: Close view of the Gate of Mazaeus and Mithridates after the anastylosis
(source: Vacharopoulou -- personal photographs, 2003).

Figure 159a: The restored interior of the Library with notice boards informing about the anastylosis (source: Vacharopoulou -- personal photographs, 2003).

Figure 159b: View of the restored interior of the Library
(source: Vacharopoulou -- personal photographs, 2003).

Figure 159c: View of the restored interior of the Library
(source: Vacharopoulou -- personal photographs, 2003).

Figure 160a: View of the restored interior of the Library (source: Vacharopoulou -- personal photographs, 2003).

Figure 160b: View of the restored interior of the Library (source: Vacharopoulou -- personal photographs, 2003).

Figure 161a: working on new and old members to connect them
(source: Schmidt 1993, 286).

Figure 161b: working on new and old members to connect them
(source: Schmidt 1993, 286).


Figure 162: removing the beams supporting the ground floor architrave of the Celsus Library (1975) (source: Wiplinger and Wlach 1996, 123).

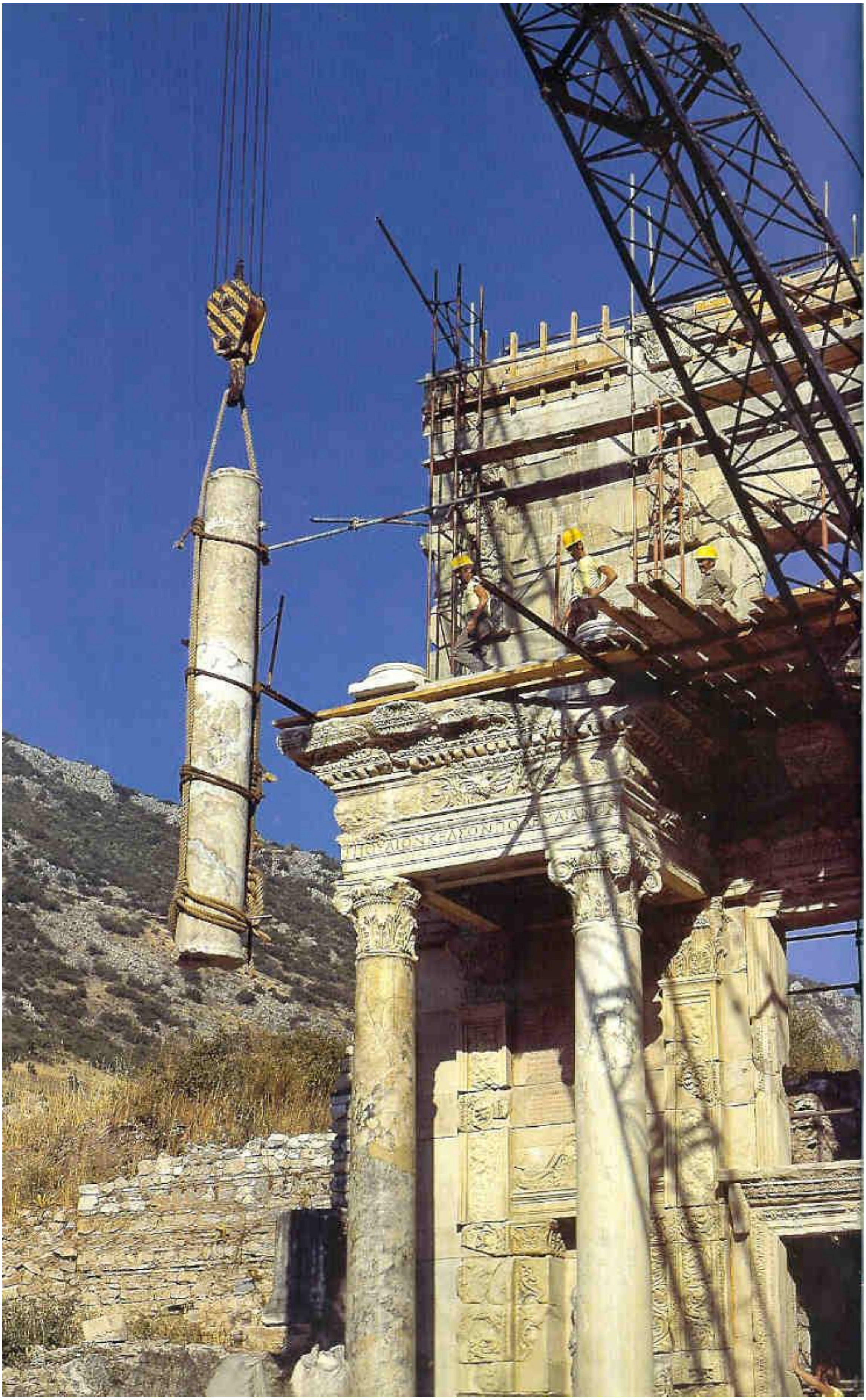


Figure 163: re-assembly of members during the anastylosis (source: Hueber 1997, 2).

Figure 164: close view of the restored façade of the Library, showing the replacement of missing members and their differentiation from the original material
(source: Vacharopoulou -- personal photographs, 2003).

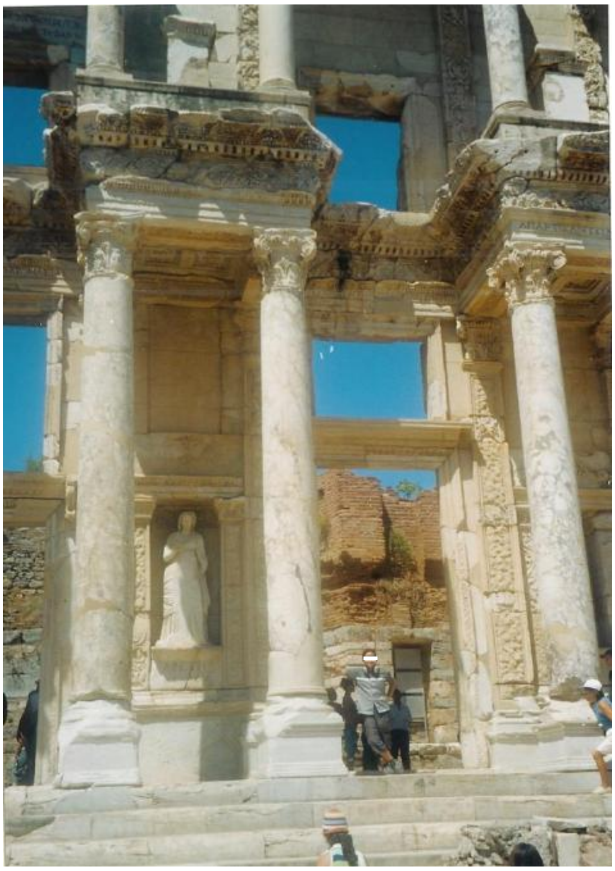


Figure 165a: close view of the restored façade of the Library, showing the replacement of missing members and their differentiation from the original material
(source: Vacharopoulou -- personal photographs, 2003).

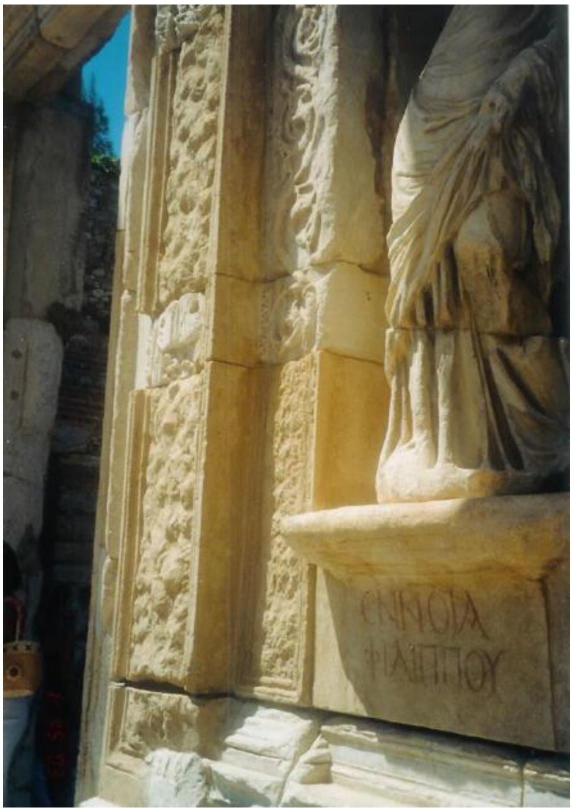


Figure 165b: close view of the restored façade of the Library, showing the replacement of missing members and their differentiation from the original material
(source: Vacharopoulou -- personal photographs, 2003).

Figure 166a: restored columns of the Library, showing the colour of the new stone being suitable to the original (source: Vacharopoulou -- personal photographs, 2003).

Figure 166b: restored columns of the Library, showing the colour of the new stone being suitable to the original (source: Vacharopoulou -- personal photographs,2003)

Figure 166c: close view of the restored façade of the Library, showing the colour of the new stone being suitable to the original (source: Vacharopoulou -- personal photographs, 2003).

Figure 167a: close view of the restored façade of the Library showing the degree of harmonious integration and discreet differentiation between original and new members (source: Vacharopoulou -- personal photographs, 2003).

Figure 167b: close view of the restored façade of the Library showing the degree of harmonious integration and discreet differentiation between original and new members (source: Vacharopoulou -- personal photographs, 2003).

Figure 167c: close view of the restored façade of the Library showing the degree of harmonious integration and discreet differentiation between original and new members (source: Vacharopoulou -- personal photographs, 2003).

Figure 167d: close view of the restored façade of the Library showing the degree of harmonious integration and discreet differentiation between original and new members (source: Vacharopoulou -- personal photographs, 2003).

Figure 168a: close view of restored parts of the Library's façade, showing the degree to which ornamentation was copied (source: Vacharopoulou -- personal photographs, 2003).

Figure 168b: close view of restored parts of the Library's façade, showing the degree to which ornamentation was copied (source: Vacharopoulou -- personal photographs, 2003).

Figure 168c: close view of restored parts of the Library's façade, showing the degree to which ornamentation was copied (source: Vacharopoulou -- personal photographs, 2003).

Figure 169a: close view of a restored column showing how harmonious but distinguishable integration of new material was achieved (source: Vacharopoulou -- personal photographs, 2003).

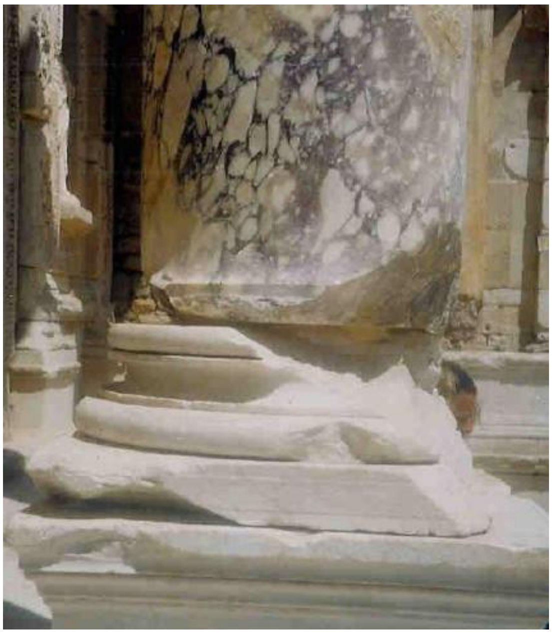


Figure 169b: close view of a restored column of the façade (source: Vacharopoulou. -- personal photographs, 2003).

Figure 169c: Close view of a restored column from the façade of the Library (source: Vacharopoulou -- personal photographs, 2003).

Figure 170a: the interior of the restored Library with notice boards providing information on the monument (source: Vacharopoulou -- personal photographs, 2003).

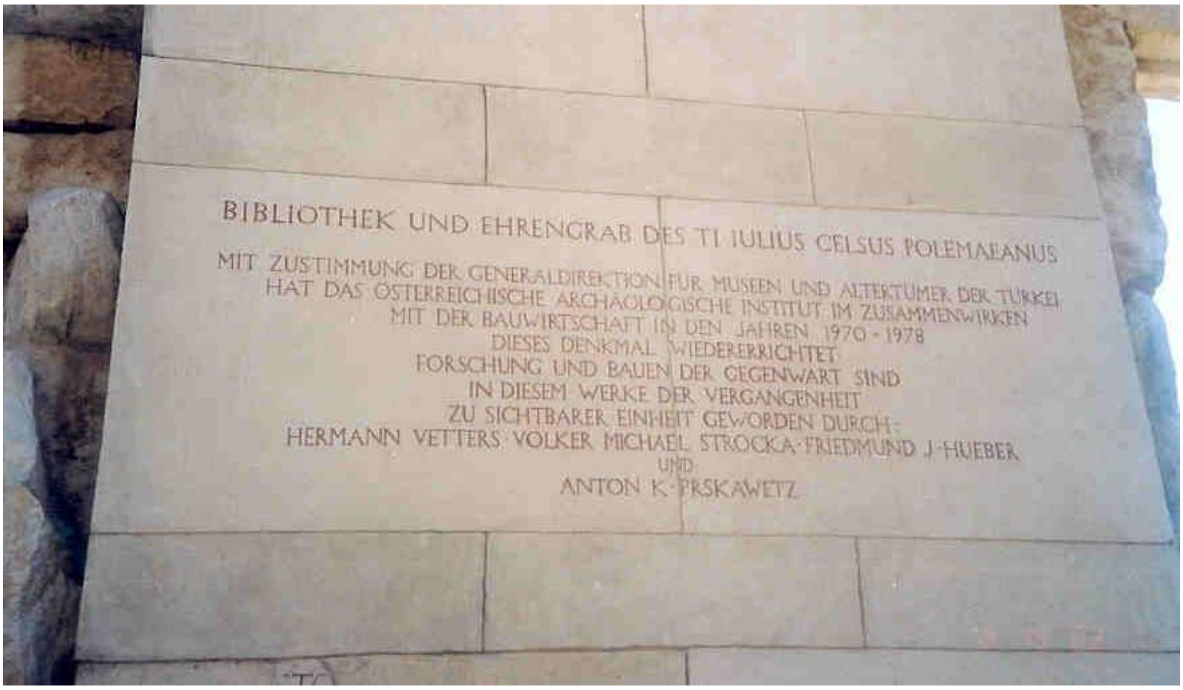


Figure 170b: notice board in the interior of the Library with an honorary inscription about the anastylosis sponsor (source: Vacharopoulou -- personal photographs, 2003).
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Figure 171a: indication of the amount of tourists visiting Ephesus every day
(source: Vacharopoulou -- personal photographs, 2003).

Figure 171b: indication of the amount of tourists visiting Ephesus every day
(source: Vacharopoulou -- personal photographs, 2003).

Figure 171c: indication of the amount of tourists visiting Ephesus every day (source: Vacharopoulou -- personal photographs, 2003).

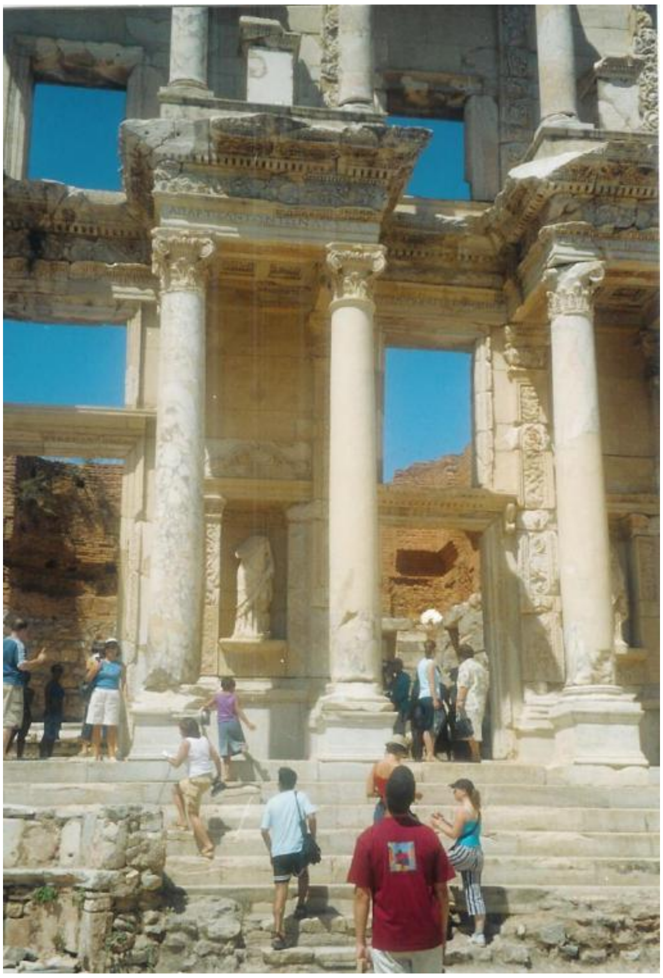

Figure 171d: indication of the amount of tourists visiting Ephesus every day (source: Vacharopoulou -- personal photographs, 2003).

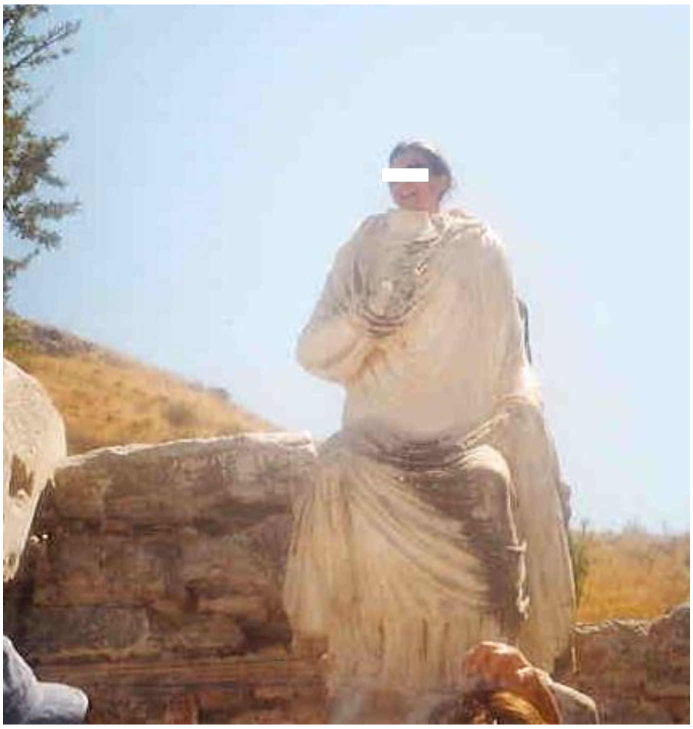

Figure 172a: aspects of uncontrolled tourism in Ephesus (source: Vacharopoulou -- personal photographs, 2003).

Figure 172b: aspects of uncontrolled tourism in Ephesus (source: Vacharopoulou -- personal photographs, 2003).

Figure 173: General view of the Agora and the Basilica
(source: Vacharopoulou -- personal photographs, 2003).

Figure 174: The Fountain of Trajan
(source: Vacharopoulou -- personal photographs, 2003).

Figure 175: the Temple of Hadrian (2003).
(source: Vacharopoulou -- personal photographs, 2003).

Figure 176a, b: Views of the Memmius monument
(source: Vacharopoulou -- personal photographs, 2003).

Figure 177: map showing the location of Pergamon in Turkey (source: Rasmussen 2004).

Figure 178a: view of the Acropolis of Pergamon from the Asklepieion
(source: Tuna 2001, 24-25).

Figure 178b: view of the Acropolis of Pergamon from the Asklepieion (source: Vacharopoulou -- personal photographs, 2003).

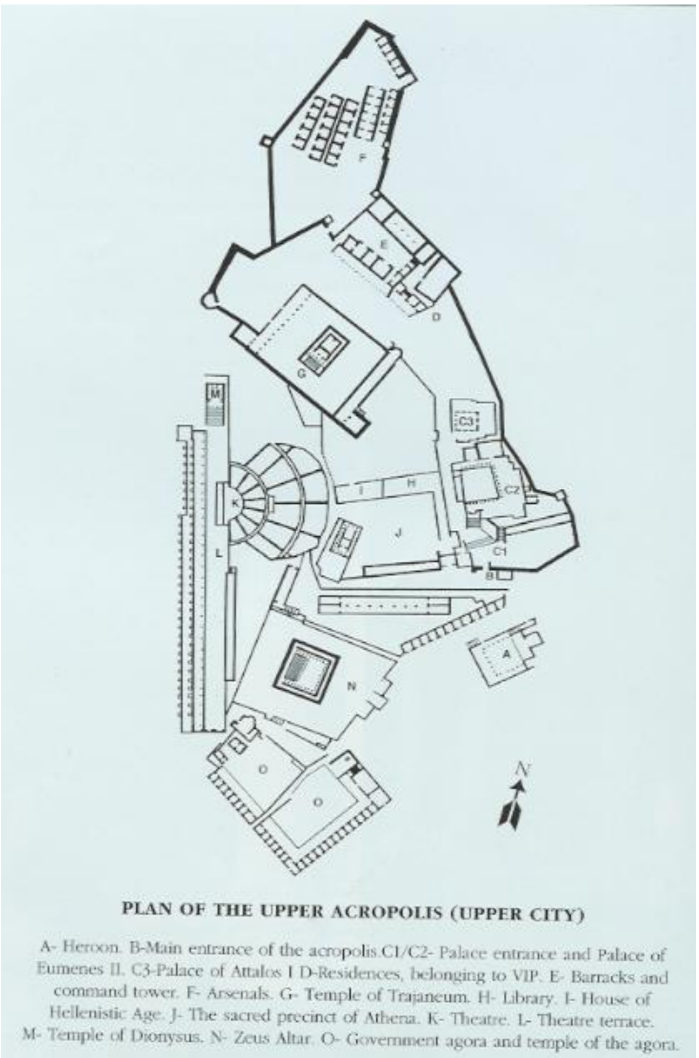

Figure 179: plan of the upper Acropolis (upper city) (source: Tuna 2001, 26).

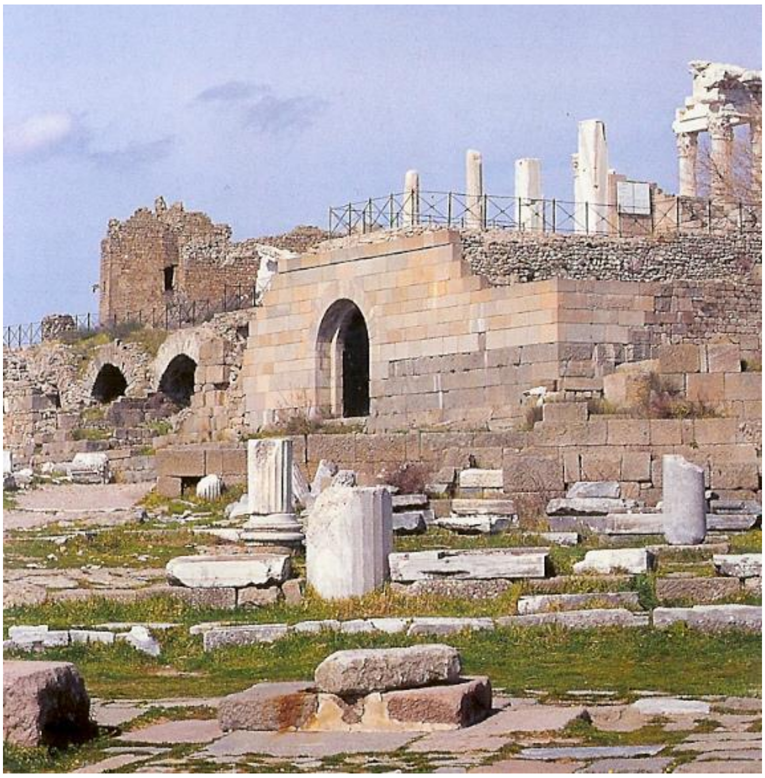

Figure 180a: general view of the temple of Trajan (source: Tuna 2001, 33).

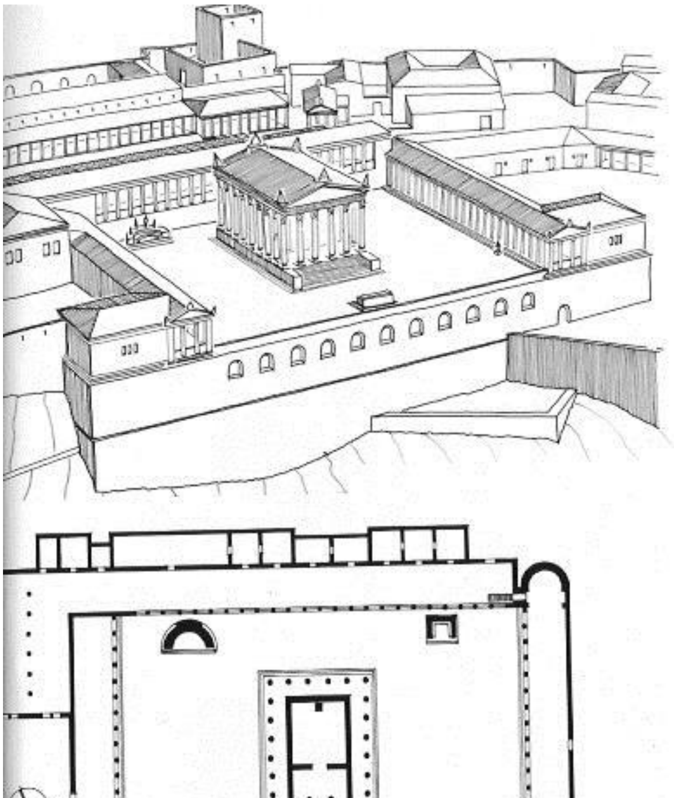

Figure 180b: graphic reconstruction and plan of the Trajaneum
(source: Radt 1973, 93).

Figure 181a: Trajaneum. View of the substructure of the temple
(source: Vacharopoulou -- personal photographs, 2003).

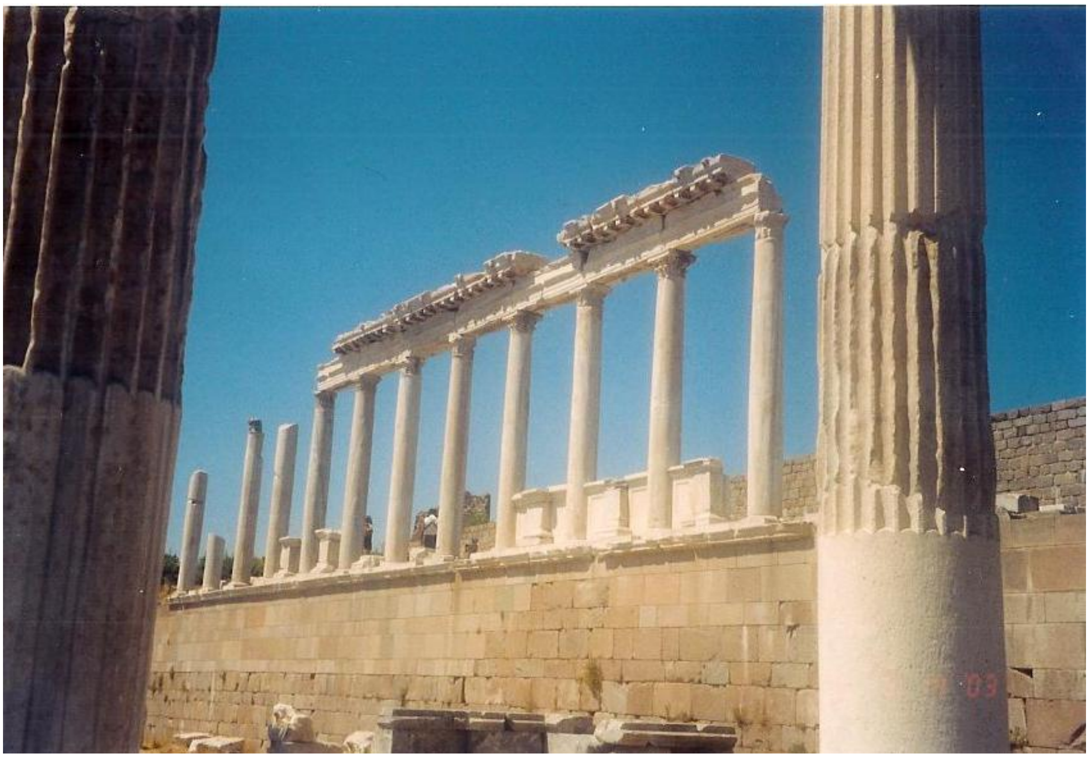

Figure 181b: the temple after its anastylosis (2003)
(source: Vacharopoulou -- personal photographs, 2003).

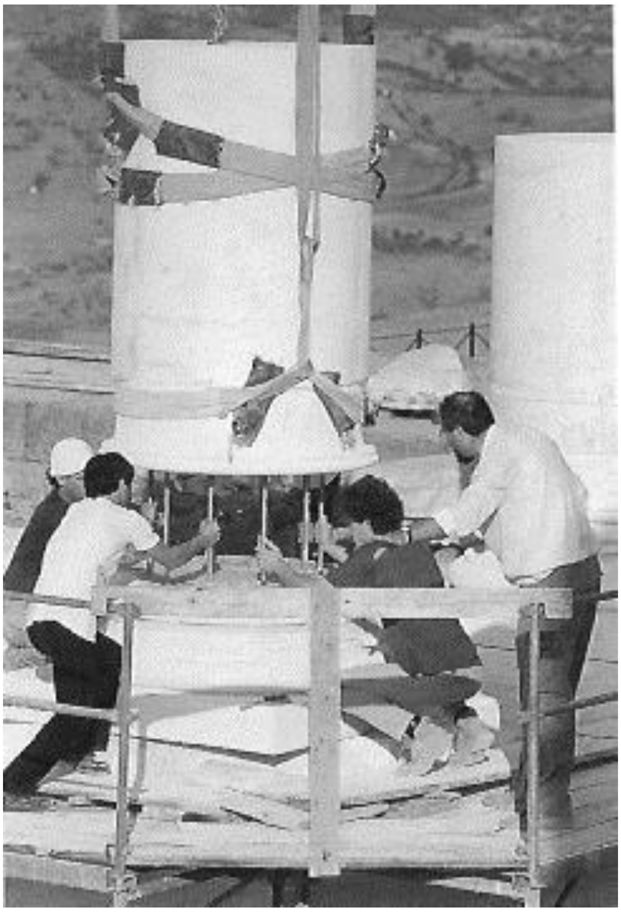

Figure 182a: joining drums and fragments of columns
(source: Schmidt 1993, 175).

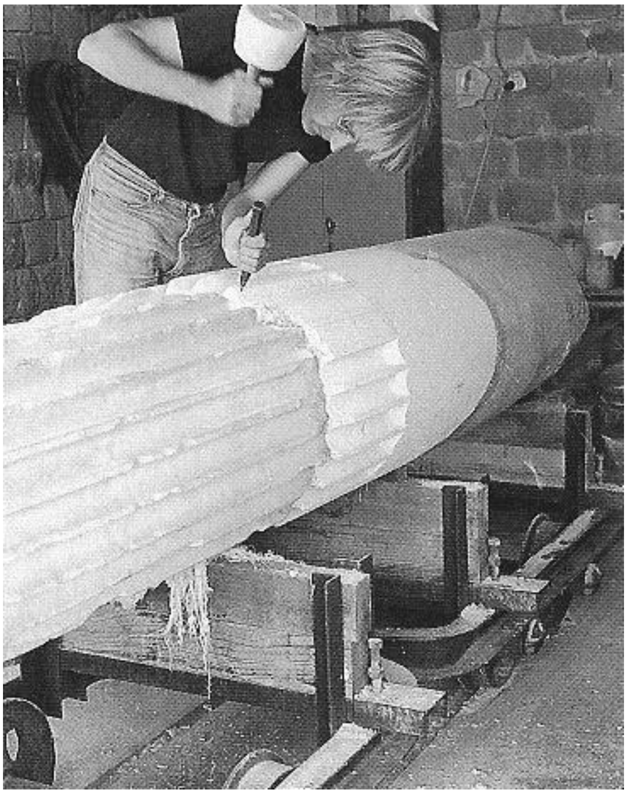

Figure 182b: working on new column drums
(source: Schmidt 1993, 176).

Figure 183a: integration of new and old members, leaving breaks and small defects visible (source: Vacharopoulou -- personal photographs, 2003).

Figure 183b: integration of new and old members, leaving breaks and small defects visible and showing the inscription of the member number
(source: Vacharopoulou -- personal photographs, 2003).

Figure 183c: integration of new and old members, leaving breaks and small defects visible (source: Vacharopoulou -- personal photographs, 2003).

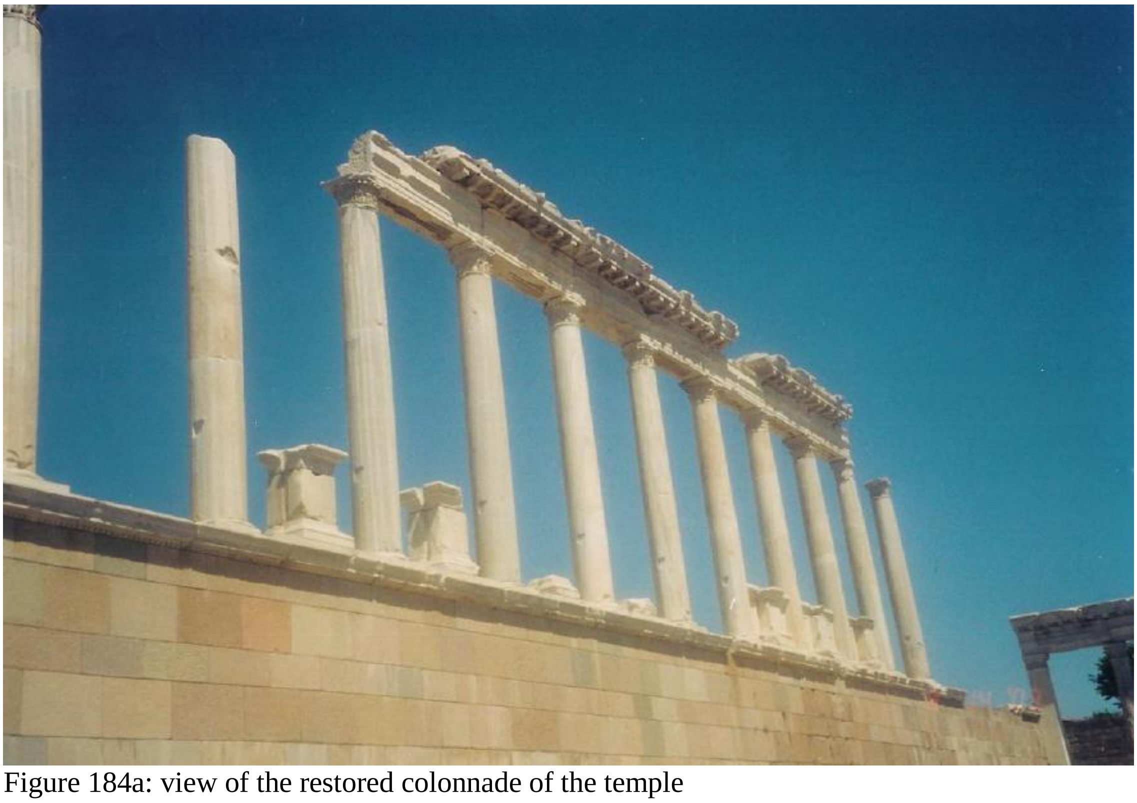

Figure 184a: view of the restored colonnade of the temple
(source: Vacharopoulou -- personal photographs, 2003).

Figure 184b: view of the restored temple
(source: Vacharopoulou -- personal photographs, 2003).

Figure 184c: view of the restored colonnade of the temple
(source: Vacharopoulou -- personal photographs, 2003).

Figure 185: the Trajaneum during its anastylosis (source: Schmidt 1993, 289).

Figure 186: notice-boards with information on the Trajaneum and its anastylosis (source: Vacharopoulou -- personal photographs, 2003).

Figure 187: elements not used in the anastylosis and found exhibited on site, near the Trajaneum (source: Vacharopoulou -- personal photographs, 2003).

Figure 188: view of part of the restored temple with one of the statues found during the excavations (source: Vacharopoulou -- personal photographs, 2003).

Figure 189a: overall view of the restored temple (1992)
(source: Schmidt 1993, 174).

Figure 189b: overall view of the restored temple
(source: Vacharopoulou -- personal photographs, 2003).

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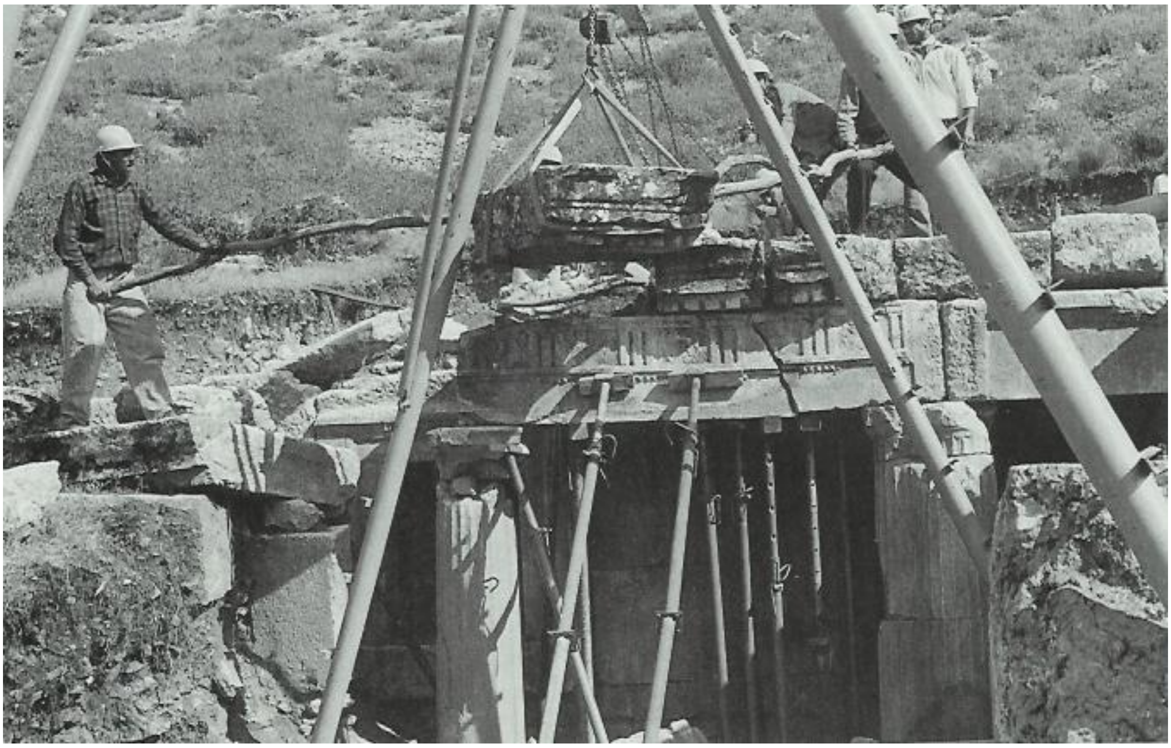

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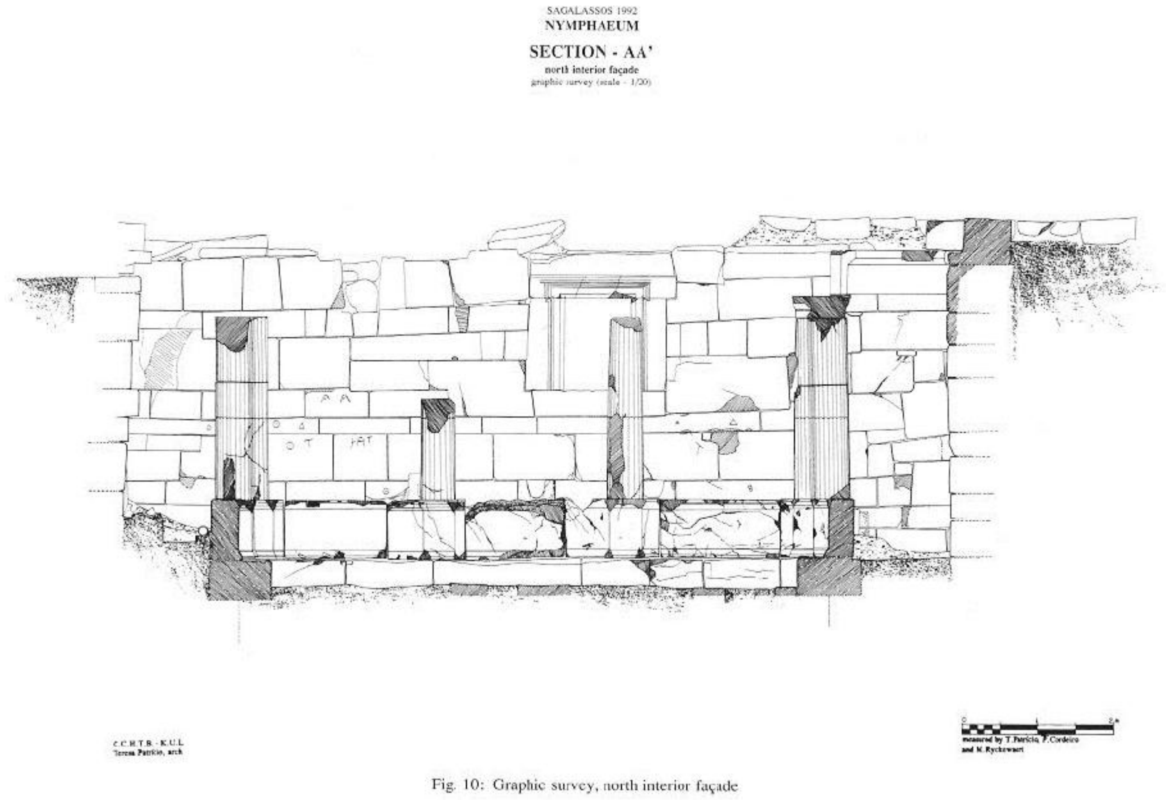

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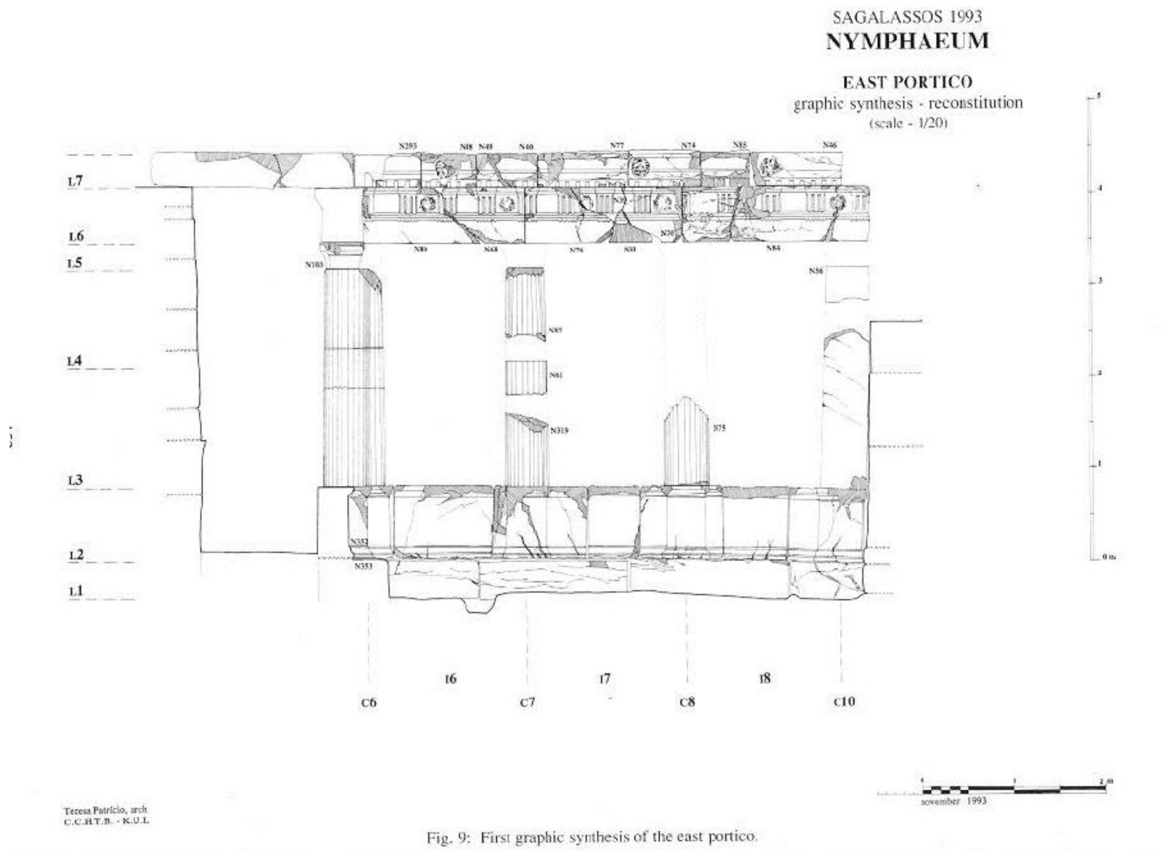

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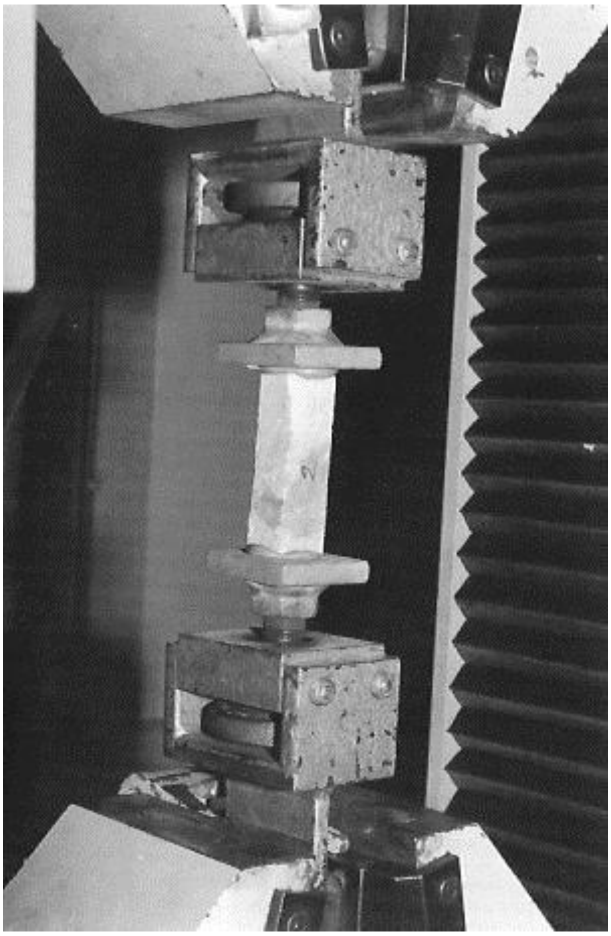

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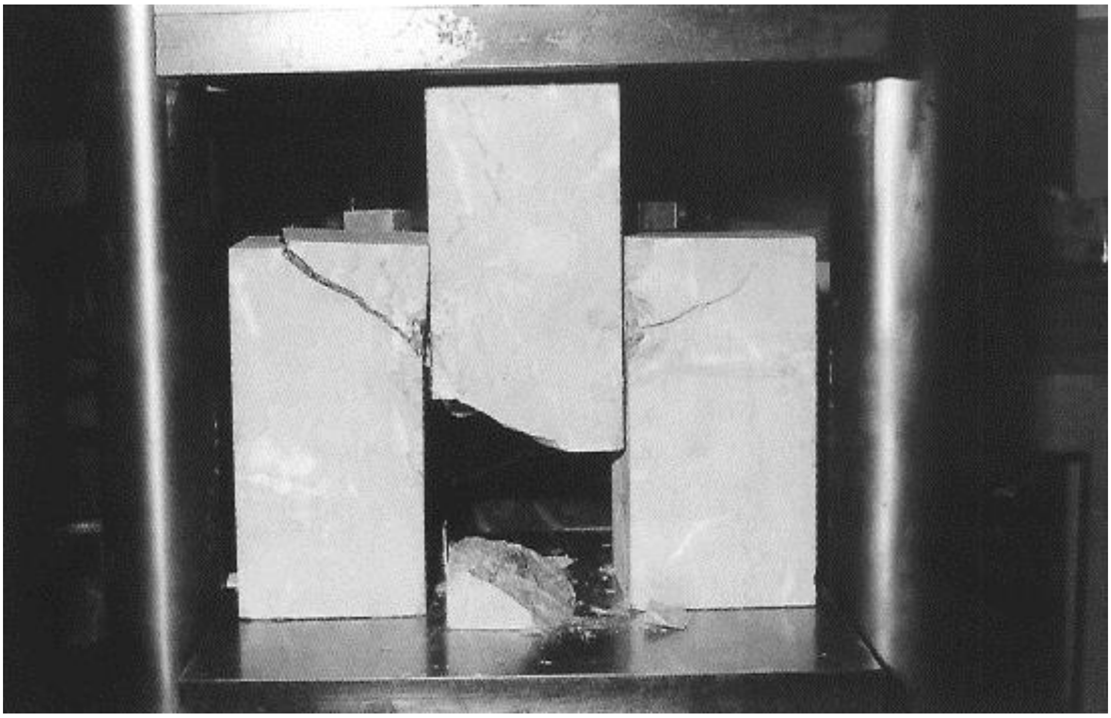

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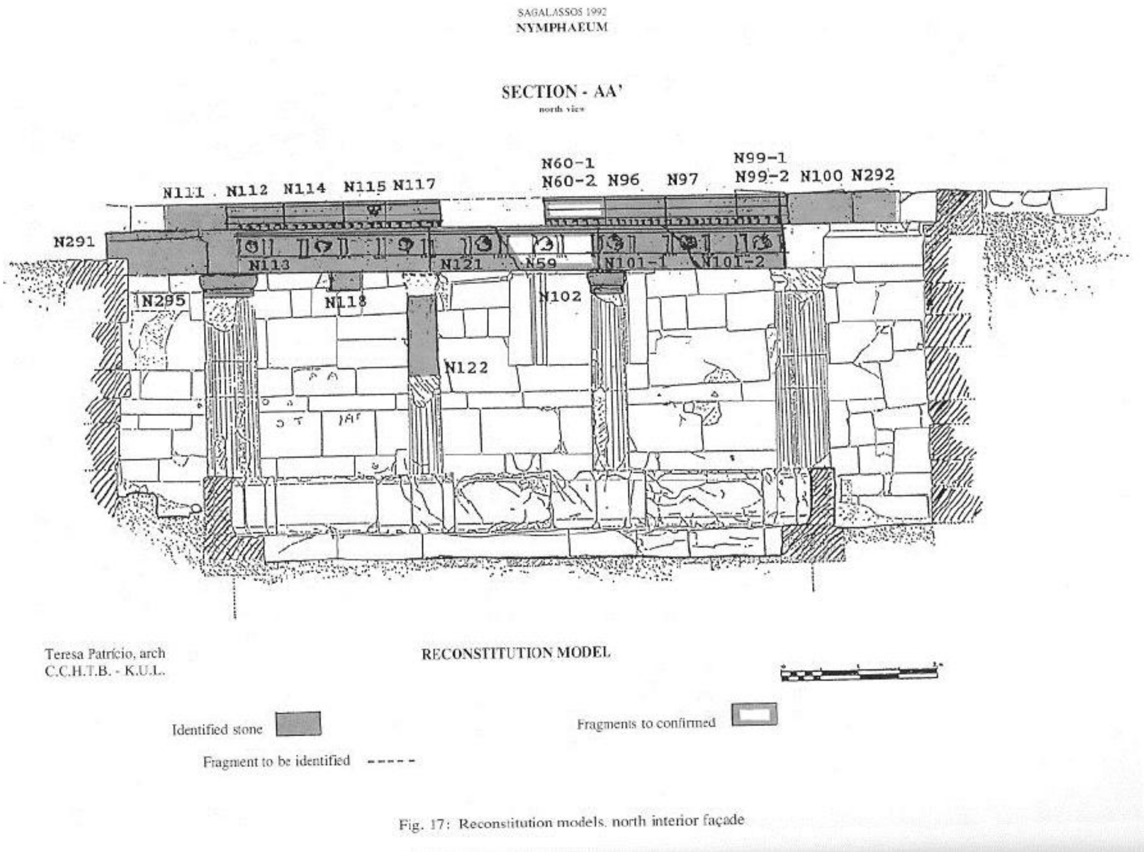

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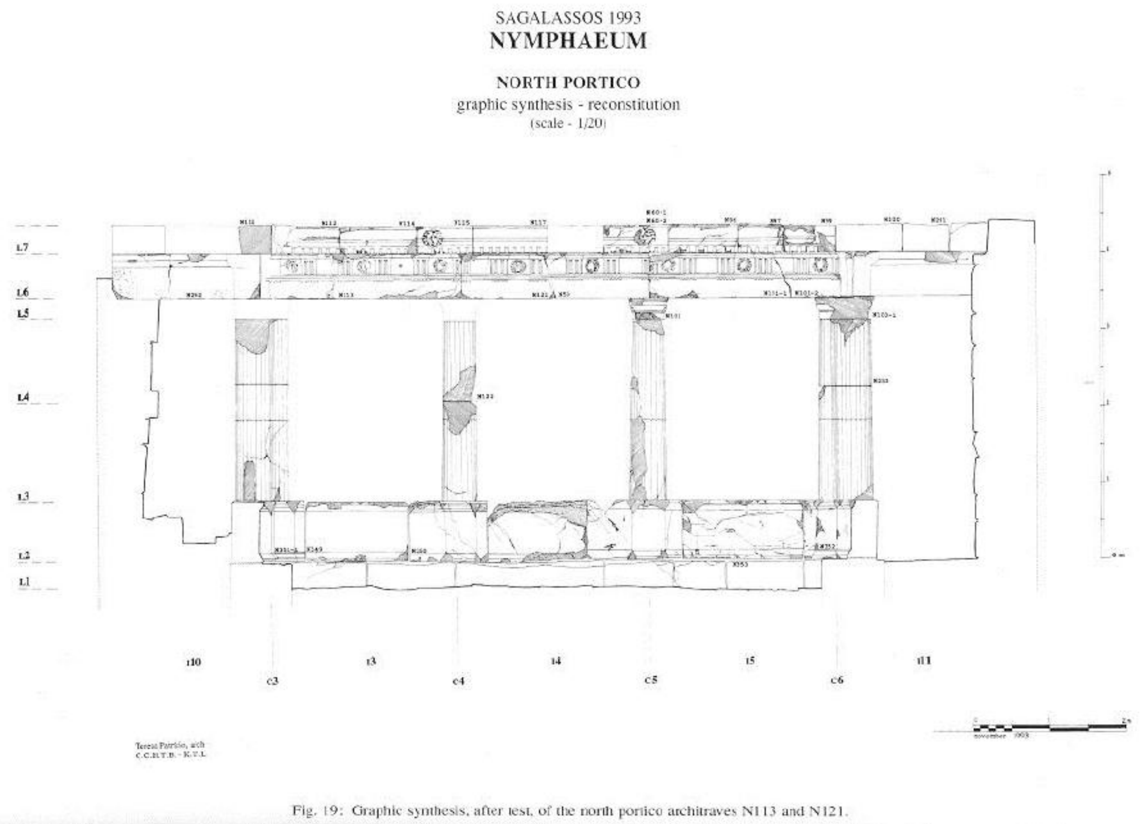

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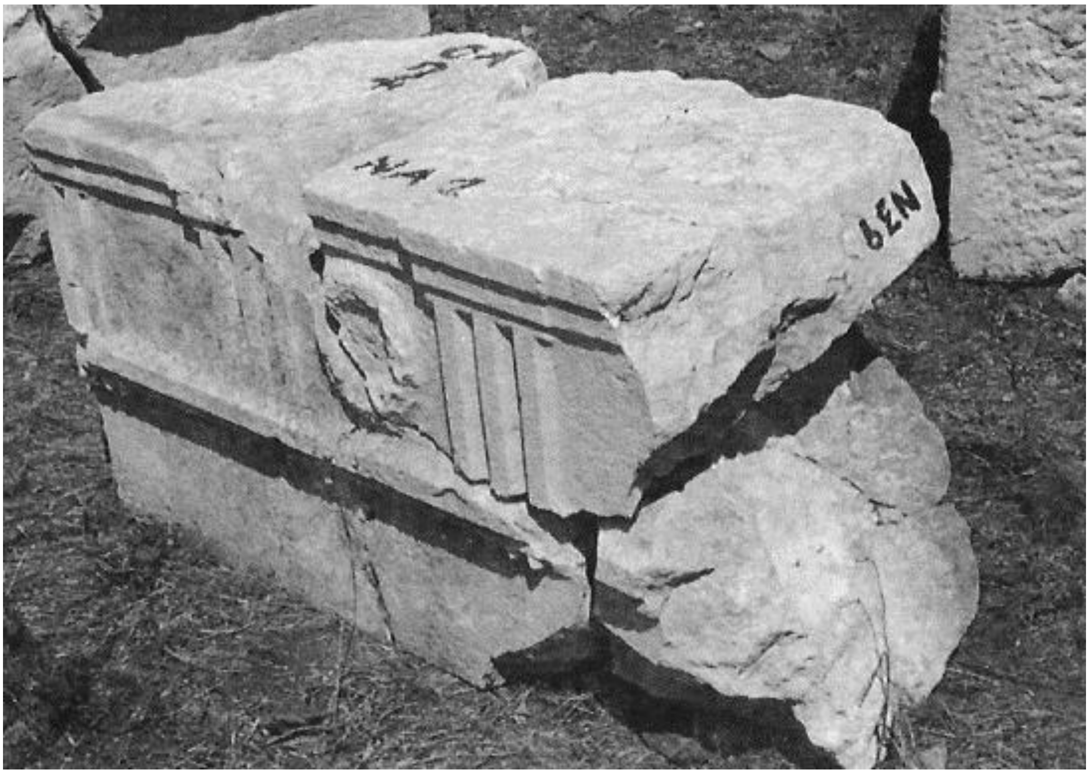

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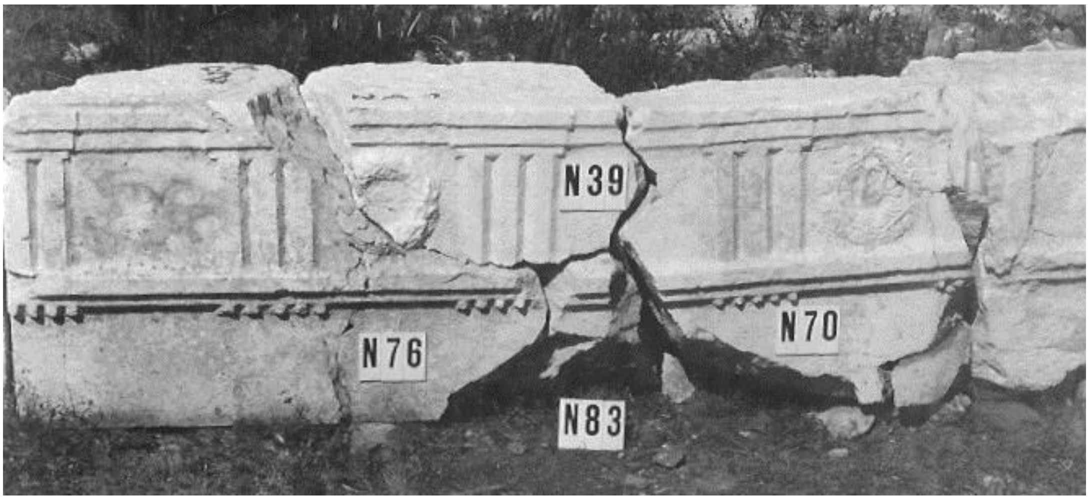

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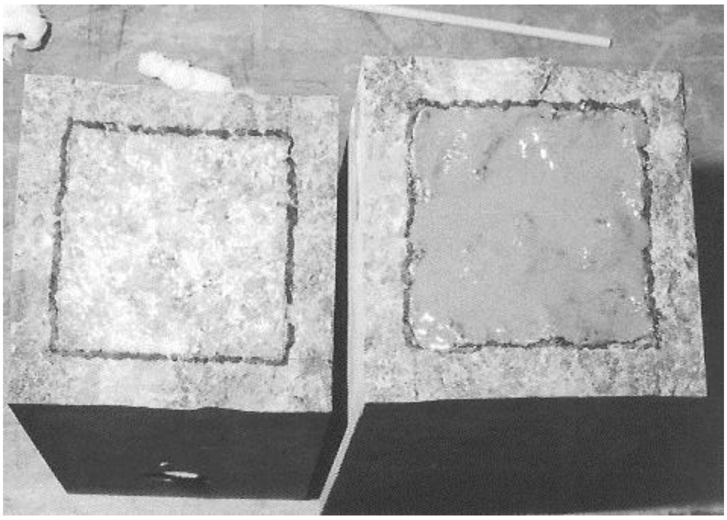

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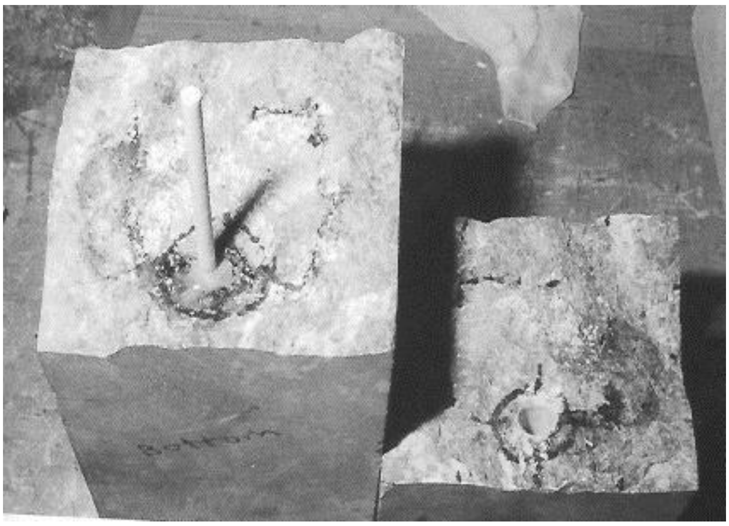

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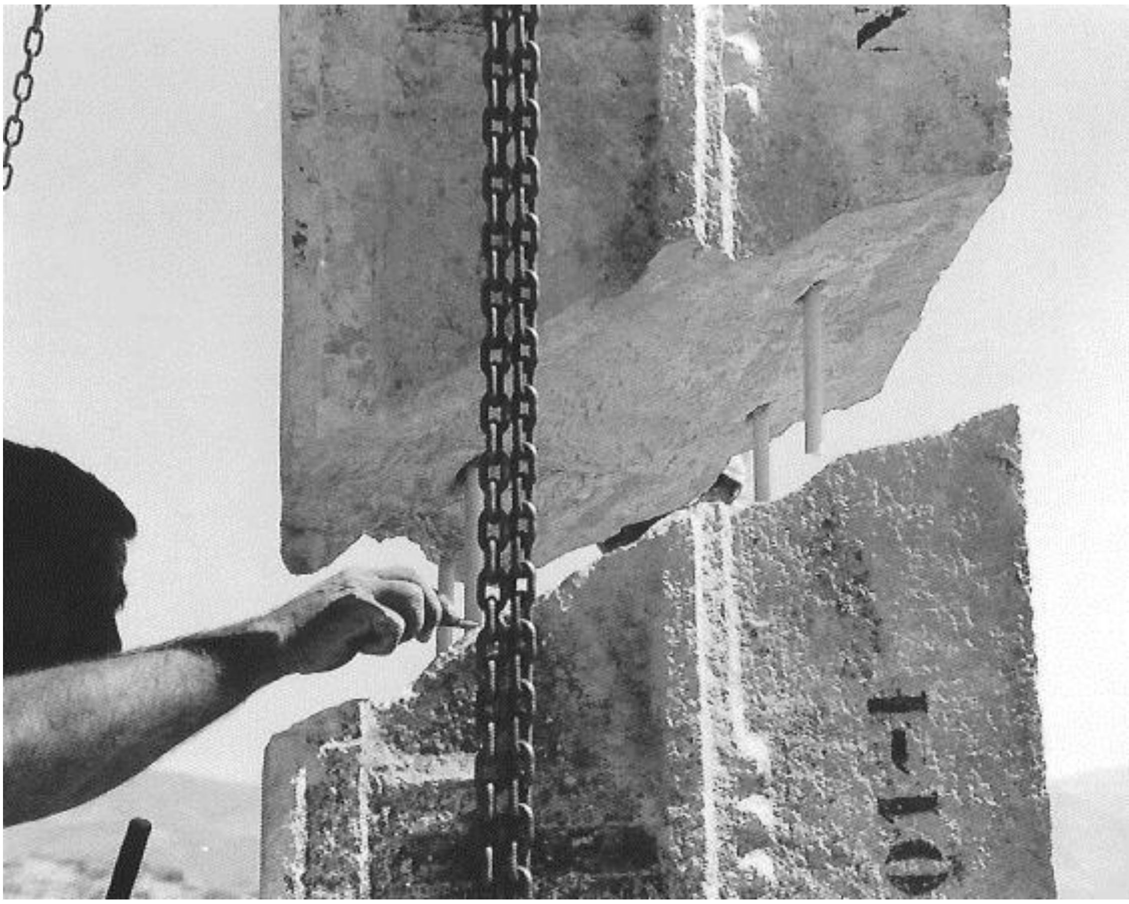

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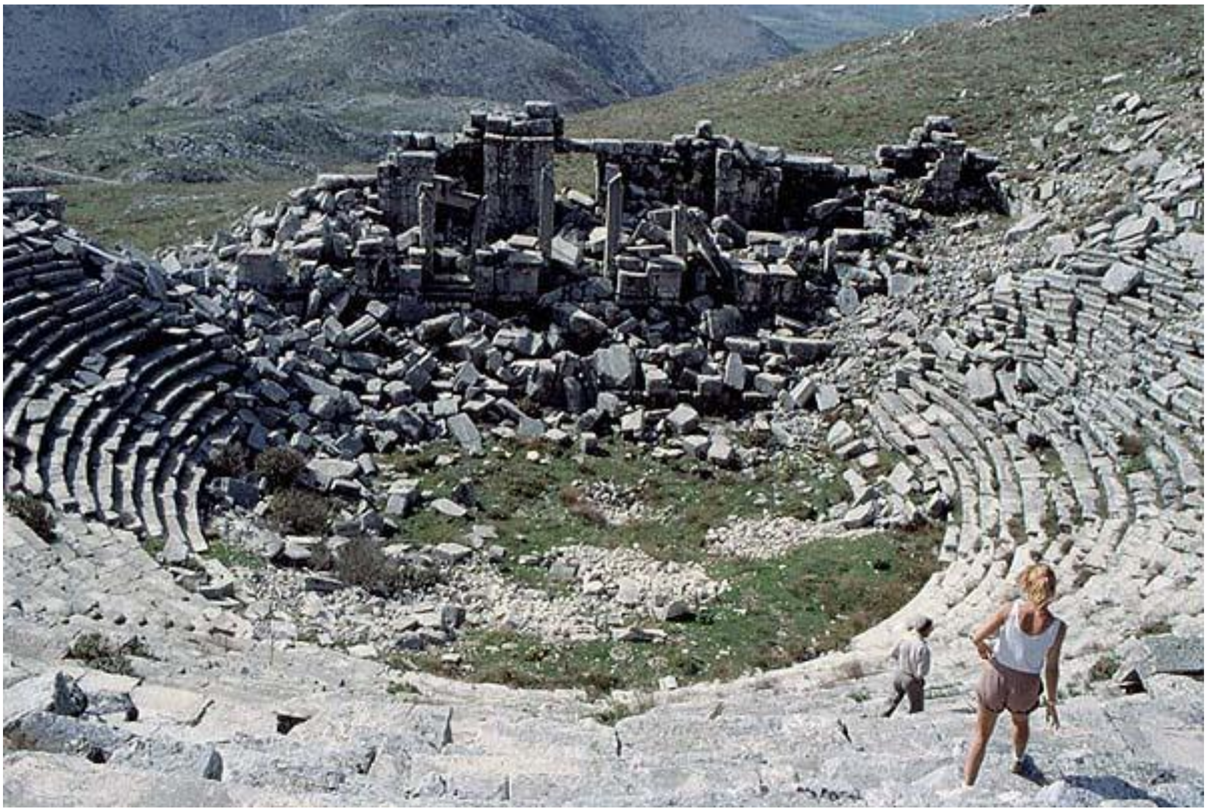

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APPENDIX B (APPENDIX TO CHAPTER 1)
SURVEY INSTRUMENTS

B1. Anastylosis Questionnaire for Relevant Professionals

B2. Form of Interview with Relevant Professionals

B3. Visitor Questionnaire

APPENDIX B1.

ANASTYLOSIS QUESTIONNAIRE FOR RELEVANT PROFESSIONALS

GUIDELINES FOR COMPLETING THE QUESTIONNAIRE

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DEFINITION OF ANASTYLOSIS

THEORETICAL AND PHILOSOPHICAL ISSUES, DRIVING FORCES

TECHNICAL ISSUES

CHARTERS

MANAGEMENT ISSUES

LOOKING FORWARD

GUIDELINES FOR COMPLETING THE QUESTIONNAIRE

1. Please answer the questions by ticking one or more answer boxes, depending on the instructions at the end of each question. (*Please tick one/ Please tick one or more*)

2. Space for extra comments is allocated at the end of each question. You can use the *'Comments'* area for anything you wish to suggest, such as a reference, a contact, or for anything complementary to your answer. You do not have to fill in the *'Comments'* area if you do not wish to.

3. You do not have to answer any question, should you feel it is unclear, or for whatever other reason you do not wish to.

4. Every question has an option of '*Other (Please specify)*'. This has been especially designed for any issues or aspects that the researcher has not identified in asking a question. Please do not hesitate to complete it, if you do not agree with any of the options available.

5. Question 43 provides for any further comments you wish to make regarding this specific questionnaire, the whole topic of this research and everything else you would wish to suggest. I would be grateful for any kind of comments you wish to make.

6. In case of need of further explanation and for further clarifications, do not hesitate to contact me at: tcrnkva@ucl.ac.uk or k_vacharopoulou@excite.com or in the address specified below:

Kalliopi Vacharopoulou
c/o Institute of Archaeology, UCL
31-34 Gordon Square
London WC1H 0PY

Thank you very much once again for our time and expertise!

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A. DEFINITION OF *ANASTYLOSIS*

1. The International Conservation Charters define *anastylosis*, *restoration*, and *reconstruction* as follows:

figure 1

Only *anastylosis*, that is to say, the reassembling of existing parts (of a monument*)….*
(The Venice Charter, 1964, *article* 15)

Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.
(*The Burra Charter, revised edition of 1999, article 1.7)*

Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric.
(*The Burra Charter, revised edition of 1999*, *article 1.8)*

But, do you consider *anastylosis* to be:
Please tick one or more.

a restoration method	
the most proper restoration method	
an excessive restoration method	
a form of reconstruction	
the most proper reconstruction method	
an excessive reconstruction	
an amalgamation of restoration and reconstruction	
other (please specify)	

figure 2

figure 3

Comments *(if any):*

figure 4

2. What do you think *anastylosis*, restoration, and reconstruction cover?
Please tick one or more.

	anastylosis	restoration	reconstruction
structure of monuments			
state of preservation			
manner of intervention			
variation of the degree of intervention			
availability of original material			
type of original material			
introduction of new material			
principles guiding the intervention			
surface conservation			
protection against weathering and pollution			
other (please specify)			

figure 5

Comments *(if any):*

3. Where do you think *anastylosis* can be used?
Please tick one or more.

in the Mediterranean region	
throughout the world	
in Europe	
in other places (please specify)	
not sure	

figure 6

Comments *(if any):*

4. Do you think that it is important to have a more complex definition of *anastylosis* than the one provided by the Venice Charter (1964)?
Please tick one only.

Yes	
No	
Does not matter	
Not sure	


figure 7

Comments *(if any):*

B. THEORETICAL AND PHILOSOPHICAL ISSUES, DRIVING FORCES

5. For which of the following reasons would you decide to apply *anastylosis*?
Please tick one or more.

structural stability	
survival of original material	
facilitation of archaeological studies	
facilitation of architectural studies	
reinstatement of monument's form	
retention of monument as material culture	
aesthetical reasons	
other (please specify)	


figure 8

Comments *(if any):*

6. In applying *anastylosis*, have you ever been influenced by, or if applying *anastylosis* would you ever be influenced by, any of the following?
Please tick one or more.

	Strongly	Weakly	Not at all
national identity			
cultural identity			
education			
interpretation			
improvement of legibility			
tourism			
creation of jobs			
funding availability			
other (please specify)			


figure 9

Comments *(if any):*

7. Please name one or more sites where one of the following aspects was a priority?

	Site(s)
national identity	
cultural identity	
education	
interpretation	
tourism	
creation of jobs	
funding availability	
other (please specify)	

Comments *(if any):*


figure 10

8. In an “ideal” *anastylosis* project, which of the following do you feel should be taken into consideration?
(Please rank them in a scale of 1 (high priority) to 9 (low priority) or leave blank if you disagree with any)

national identity	
cultural identity	
education	
interpretation	
tourism	
creation of jobs	
funding availability	
structural stability	
other (please specify)	


figure 11


figure 12

Comments *(if any):*

9. If you have been directly involved in a project that employed *anastylosis*, which of the following principles were adopted during anastylosis implementation, and to what extent?
Please tick as many as apply...

	more	less
respect for historic values		
respect for artistic values		
respect for scientific values		
respect for cultural values		
respect for contextual values		
respect for economic values		
respect for aesthetic values		
respect for valid contributions of all periods		
respect for integrity		
respect for material authenticity		
respect for design authenticity		
respect for authenticity of workmanship		
respect for authenticity of place		
respect for traditional setting		
respect for original material		
other (please specify)		


figure 13

Comments *(if any):*

10. Despite respect for authenticity and integrity of a monument, do you believe that *anastylosis* can affect a monument’s…?

	seriously	partially	not at all
integrity			
authenticity			


figure 14

Comments *(if any):*

11. What do you think is of higher priority?
Please tick one.

authenticity and integrity of the monument	
interpretation and education through *anastylosis*	
preservation of historic memory	
structural stability	
other (please specify)	


figure 15

Comments *(if any):*

12. Do you think that the concept of reversibility of intervention is?
Please tick one.

attainable	
unattainable	
not sure of either of the above	

Comments *(if any)*:

figure 16

13. Do you believe that *anastylosis* should be a matter of?
Please tick one.

an abstract discussion of principles	
presentation and application of principles	
application of the method	
all of the above	
other (please specify)	

figure 17

Comments *(if any)*:

C. TECHNICAL ISSUES

14. In your opinion, *anastylosis* can be applied to:
Please tick one.

any kind of monument	
all stone monuments	
only monuments comprised of autonomous members with little or no mortar	
not sure	
other (please specify)	

figure 18

Comments *(if any)*:

15. In your opinion, should there be a named percentage of original material that justifies *anastylosis* implementation? If yes, would you quantify this percentage as?
Please tick one.

Yes	
No	
Not sure	

100% of surviving material	
90% of surviving material-10% new material	
80% of surviving material-20% new material	
70% of surviving material-30% new material	
60% of surviving material-40% new material	
50% of surviving material-50% new material	
other (please specify)	

Comments *(if any)*:

16. Should the initial state of preservation play an important role in an *anastylosis* decision?
Please tick one.

Yes	
No	
Not sure	

Comments *(if any)*:

figure 19

17. Should new material used together with original material be?
Please tick one or more.

visually harmonious at a distance but differentiable upon close inspection	
visually differentiable	
visually harmonious	
does not matter	
other (please specify)	


figure 20


figure 21

Comments *(if any):*

18. If differentiation should be aimed at, how should it be achieved?
Please tick one or more.

use of different composition material	
use of different colour	
use of different texture	
abstraction of details	
bear contemporary stamp or identifying mark	
use of explanatory labels	
aid of modern technology and multimedia	
other (please specify)	


figure 22


figure 23

Comments *(if any):*

19. Should eroded/weathered fragments be utilized in *anastylosis* as defined using the current criteria?

Yes		*please answer question 21.*
Not sure		*please answer question 21.*
No		*please answer question 20.*
Does not matter		*please answer question 20.*

Comments *(if any):*


figure 24

20. If you answered 'no' in the previous question, you did so because you believe:
Please tick one or more.

too much intervention is needed	
they destroy perfection of buildings' lines	
other (please specify)	

Comments *(if any):*

21. What kind of material should be used in re-integrations?
Please tick one.

natural stone	
artificial stone	
other (please specify)	

Comments *(if any):*


figure 25

22. If natural or artificial stone should be used, is it because of:
Please tick one or more.

natural stone	
philosophical concerns	
an aesthetically satisfying result	
material compatibility	
its contribution to reading the structure as a whole	
artificial stone can be materially incompatible	
artificial stone endangers the sense of the architectural members' autonomy	
other (please specify)	

artificial stone	
easy and fast production and workability	
ease of differentiation between old and new material	
optimal adhesion to the original stone	
its tested compatibility with the historic fabric	
the lack of necessity for trained stonemasons	
comparative cost benefits	
other (please specify)	

Comments *(if any)*:

23. Should the original (ancient) structural supporting system be followed?
Please tick one.

Yes	
No	
Does not matter	

Comments *(if any)*:

figure 26

24. For connection of architectural elements, what material should be used?
Please tick one.

material similar to original joining material (or none, if none was used originally)	
new joints made of laboratory tested materials	
other (please specify)	

Comments *(if any)*:

figure 27

25. If laboratory-tested material is used for joining architectural elements, which ones would you use/have you used?
Please tick one or more.

cement	
steel rods/pins	
epoxy glues	
fibreglass rods/pins	
titanium rods/pins	
other (please specify)	

figure 28

Please elaborate on the systems used at the sites you are familiar with.

Comments *(if any)*:

26. Should ancient working tools be used in *anastylosis* applications?
Please tick one or more.

Yes, they are really important because they achieve:

accuracy	
authenticity in workmanship	
best results	
other (please specify)	

No, modern ones are:

accurate also	
less expensive to produce	
no need for old-craft training	
other (please specify)	

Comments *(if any)*:

27. Should new or traditional methods and techniques be used?
Please tick one.

new methods		*please answer question 29*
traditional methods		*please answer question 28*
both		*please answer both questions 28 and 29*
any		*please answer both questions 28 and 29*

Comments *(if any):*

28. Do you think that traditional methods should be used because they:
Please tick one or more.

ensure authenticity in workmanship	
ensure better results	
constitute a professional approach	
constitute an approach following the requisitions of the latest restoration theories	
other (please specify)	

figure 29

Comments *(if any):*

29. Do you think that new methods are used because they:
Please tick one or more.

are cost-effective	
have faster results	
are easier to use	
other (please specify)	

figure 30

Comments *(if any):*

D. CHARTERS

30. Which conservation charter, do you think, provides best for *anastylosis* implementation?
Please tick one or more.

The Athens Charter for the Restoration of Historic Monuments (1931)	
Carta del Restauro Italiana (1931)	
The International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter) (1964)	
Carta del Restauro Italiana (Carta di Roma) (1972)	
The Declaration of Amsterdam (Congress on the European Architectural Heritage) (1975)	
ICOMOS Charter for the Protection and Management of the Archaeological Heritage (1990)	
ICOMOS NEW ZEALAND Charter for the Conservation of Places of Cultural Heritage Value (1992)	
The Nara Document on Authenticity (1994)	
Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter) (1999)	
Other (please specify)	

Comments *(if any):*

figure 31

31. In the site(s) in which you were involved, which conservation charters were followed, and how actively?
Please tick one or more.

	With free interpretation of principles	Together with delineation of extra principles	not altogether
The Athens Charter for the Restoration of Historic Monuments (1931)			
Carta del Restauro Italiana (1931)			
The International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter) (1964)			
Carta del Restauro Italiana (Carta di Roma) (1972)			
The Declaration of Amsterdam (Congress on the European Architectural Heritage) (1975)			
ICOMOS Charter for the Protection and Management of the Archaeological Heritage (1990)			
ICOMOS NEW ZEALAND Charter for the Conservation of Places of Cultural Heritage Value (1992)			
The Nara Document on Authenticity (1994)			
Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter) (1999)			
Other (please specify)			

Comments *(if any)*:

32. Do you believe that the charter(s) you utilised form a sufficient guide for planning and executing *anastylosis*?
Please tick one.

Yes, strongly	
Yes, no major problems	
No, it could have been better	
Not sure	

Comments *(if any)*:

figure 32

33. What are the main advantages and disadvantages of the charter(s) you utilised?
Please tick one or more.

main advantages	
provision of a theoretical framework	
flexibility of interpretation	
provision of adequate guidance	
quite old but still valid principles	
other (please specify)	

main disadvantages	
too theoretical	
too general	
unclear	
inadequate	
outdated	
other (please specify)	

Comments *(if any)*:

34. Did you encounter any problems in the implementation of *anastylosis* according to that particular conservation charter?
Please tick one.

Yes, many	
Yes, a few minor problems	
Occasionally	
No, not at all	

Comments (if any):

figure 33

35. If you did encounter problems, please elaborate and indicate if you regarded them as a major impediment to completion of the project:
Please tick one or more.

	yes	to some extent	no	other
variation in the interpretation of principles by the professionals involved				
difficulties in the co-operation of multiple disciplines				
bureaucratic issues				
decisions imposed by financial reasons				
other (please specify)				

Comments *(if any):*

E. MANAGEMENT ISSUES

36. In your experience, what is the current procedure for approving an *anastylosis* proposal?
Please tick one or more.

	decision-making multi-disciplinary board	specific directorate	multi-step process	other (please specify)
regional				
national				
international				

Comments *(if any):*

37. How would you describe the procedure as a whole?
Please tick one.

very efficient	
efficient to some extent	
not efficient	
no comment	
other	

figure 34

Comments *(if any):*

38. In your experience, what are the main disciplines that have co-operated in *anastylosis* planning and implementation?
Please tick one or more.

Archaeology	
Architecture	
Civil engineering	
Structural engineering	
Geology	
Conservation	
Policy and planning	
Site management	
Heritage management	
Information systems	
Other (please specify)	

figure 35

Comments *(if any):*

F. LOOKING FORWARD

39. Do you believe that a new charter, or an amendment to an existing charter, is warranted regarding *anastylosis*?
Please tick one.

figure 36

Yes		*Please answer question 40.*
Not really		*Please answer question 42*
No		*Please answer question 42*
Other		*Please answer question 42*

Comments *(if any):*

40. Should this charter or amendment comprise?
Please tick one or more.

figure 37

determination of principles	
delineation of the limits of anastylosis	
a methodological approach to monuments	
other (please specify)	

Comments *(if any):*

41. Please rank the importance of the following issues in such a charter or amendment, with 1 being most important.

figure 38

Theoretical Issues	
Philosophical Issues	
Technical Issues	
Other	

Comments *(if any):*

42. Rather than a charter or amendment, what would you suggest, according to your experience?

figure 39

43. Please use the space below for any additional comments.

Please write down your details:

Name: *Profession:*

Address: *Email address:*

Thank you very much for your time and expertise!

APPENDIX B2. FORM OF INTERVIEW WITH ANASTYLOSIS PROFESSIONALS

- What does anastylosis mean as a term and as a method?
- What are the fundamental differences between anastylosis and
- a.restoration, and b.reconstruction?
- How decisive is the role of driving forces -such as political legitimisation, education/interpretation, and tourism- in the implementation of anastylosis?
- To what kind of monuments -in terms of architecture and structure- is anastylosis applied and why?
- Regarding the original material, would you define a proportion of surviving original material that justifies their re-assembly?
- How the issues of very small and minute surviving fragments and of deformed architectural elements should be dealt?
- What is your opinion about the completion of missing parts? To what extent do you advice the re-integrations with new material? What kind of new material do you think should be used? Natural or artificial?
- How should the integration of new material with the original should be performed? What are the technical aspects that emerge?
- What is your opinion about the use of new or traditional methods and techniques? Which should be used or preferred?
- What are the main technical problems encountered?
- What about the people who undertake anastylosis? Who should they be? From which disciplines should they come from? Are there any more disciplines that the experts can contribute in the implementation of anastylosis?
- What about the reversibility of the intervention? Can it be achieved? In what grounds?
- How feasible is to respect the integrity and the historical, archaeological and artistic values of the monuments?
- What about the authenticity of the intervened monument? How authentic it emerges after the anastylosis intervention?
- What do you think of the importance of the international conservation charters in general? How significant they are for conservation planning and implementation? Do

they give enough guidance and advice? Can you identify problems in the implementation of anastylosis according to the charters? If yes, what are they?

- How much gravity do they have in practice? If much, should they have less? Or if not much, should they have more? What are their advantages and their disadvantages?
- Regarding what the Venice Charter (1964) delineates for anastylosis, do you believe it provides for anastylosis' implementation enough? Is it clear and lucid?
- Is anastylosis implemented according to the way it is defined in the charters?
- Will you be satisfied with a set of recommendations-guidelines attached to the Venice Charter?
- What issues should be covered by that? What would you suggest regarding the weaknesses of the charters?
- Do you have any more comments in the topic?

APPENDIX B3. VISITOR QUESTIONNAIRE

1. Do you think that anastylosis is about?

   a. repair

   b. reconstruction

2. Have you seen monuments subjected to anastylosis anywhere else?

   a. Yes

   b. No

3. If yes, please say where:

4. Would you feel pleased and proud if a monument near your home had been restored?

   a. Yes

   b. No

5. Do you think that the understanding of a ruined monument depends on an individual's knowledge of archaeology and architecture?

   a. Yes

   b. No

6. Do you think that the interpretation of a restored monument can educate you regarding

   (You can choose as many as you like)

   a. archaeology

   b. architecture

   c. aesthetic values

   d. artistic values

   e. historic values

7. Do you think that anastylosis and archaeological site conservation can attract more tourists to an archaeological site?
    a. Yes
    b. No

8. If yes, would you be happy with attracting tourists in this way?
    a. Yes
    b. No

9. What do you think a good anastylosis would involve? (Choose as many…)
    a. conservation of the architectural members of a monument
    b. completion of missing parts with new material
    c. use of original material only
    d. making the monument look as it was in its prime time
    e. preserving the monument as it was found
    f. stabilising the structure of a monument

10. In principle, which do you think is best?
    a. a monument presented as found
    b. a monument subjected to anastylosis
    c. a small scale replica of the monument with the aid of modern technology
    d. a monument reconstructed

11. If it was up to you, which of these reasons would prompt you to the restoration of a monument?
    a. reinforcement of national/cultural identity
    b. educating the public about the archaeological remains
    c. explaining the value of the monuments
    d. attracting tourists
    e. creating jobs

12. Would you like to be consulted about why you value a monument, before any conservation takes place?

   a. Yes
   b. No

13. Looking at a monument that has been restored, do you think it…

   a. seems normal
   b. seems fake
   c. not sure

14. Do you believe that it is important to preserve the historic record and stories about a monument?

   a. Yes
   b. No

15. At which country do you normally reside?

16. Record gender

   a. Male
   b. Female

17. What is your age range?

   a. under 18
   b. 19-24
   c. 25-34
   d. 35-44
   e. 45-54
   f. 55-64
   g. above 65

18. Did you complete your full-time education?

   a. at the age of 18
   b. after college, first degree or diploma
   c. after postgraduate degree
   d. are you at part-time education at present

APPENDIX C (APPENDIX TO CHAPTER 3)
INFORMATION ON ANASTYLOSIS

C1. Definition of anastylosis according to the charters

C2. References to anastylosis in the bibliography

C3. Anastylosis and the international conservation charters

APPENDIX C1. DEFINITION OF ANASTYLOSIS ACCORDING TO THE CHARTERS

Anastylosis has been defined in the international conservation documents as follows:

- *...to reinstate any original fragments that may be recovered (anastylosis)…*

(Athens Charter , 1931)

- *...anastylosis, that is to say, the reassembling of existing but dismembered parts….*

(Venice Charter, 1964)

- *…anastylosis, meaning the re-composition of existing parts that have fallen….*

(Carta del Restauro Italiana, 1931)

- *…reassembly (anastylosis) means putting existing but dismembered parts back together…*

(ICOMOS New Zealand Charter, 1992)

APPENDIX C2. REFERENCES TO ANASTYLOSIS IN THE BIBLIOGRAPHY

- ‘the excessive reconstruction of old buildings’ (Melucco Vaccaro 1996a, 204)
- ‘architectural reconstruction……in relation to the rebuilding of archaeological ruins, or anastylosis’ (Melucco Vaccaro 1996c, 330).
- ‘reconstruction of the object from its scattered fragments’ (Philippot 1996c, 361).
- ‘reconstruction should be limited to anastylosis’ (Stubbs 1995, 77-78).
- ‘…rebuilding of a fragmented monument….is known as anastylosis’ (Plenderleith 1968, 129).
- ‘a re-erection, when done strictly as anastylosis, differs visually from a reconstruction that introduces new materials’(Schmidt 1997, 45).
- ‘re-erection of columns as the simplest form of anastylosis’ (Schmidt 1997, 45).
- ‘restoration by anastylosis’ (Feilden 1994, 10).
- ‘the proper method of restoration is to use to the maximum the original parts found in situ (the term is anastylosis)….’ (Frin 1966, 94).
- ‘reconstructions by anastylosis’ (Frin 1966, 94).
- anastylosis is ‘a restoration in the broader sense of the term’, ‘undoubtedly a restoration’ (Patricio 1996, 102; Patricio and Van Balen 1993, 87).
- ‘anastylosis is basically similar to any other restoration of a work of art’ (Hueber in Patricio and Van Balen 1993, 87).
- different forms of restoration (clearing and conservation, display, anastylosis, reconstruction) according to manner, degree and extent (Mertens 1995, 113 and 121).
- ‘anastylosis in the strict sense….the identical re-erection of a dismembered historical building or part of it in its original position’ (Mertens 1995, 115).
- ‘reassembling the components of dismembered ancient structures’ (Starosta 1999, 83).
- ‘anastylosis implies repositioning of all the original material, to which only a limited number of new pieces are added as absolutely necessary’ (Orlandos in Dimacopoulos 1985, 20).
- ‘anastylosis is the practical aspect of archaeology’ (Petrakos in AA 1996, 1).
- anastylosis as a branch of archaeology (Doumas in AA 1996, 63).
- anastylosis as reconstruction by reassembling (Sanpaolesi 1972b, 160).
- anastylosis is a specialised form of restoration (Karadedos and Lavvas 2000, 5).

APPENDIX C3. ANASTYLOSIS AND THE INTERNATIONAL CONSERVATION CHARTERS

International charters form part of modern conservation history. The concept of anastylosis is explored via these instruments.

The Athens Charter for the Restoration of Historic Monuments (1931)

The Athens Charter was adopted at the *First International Congress of Architects and Technicians of Historic Monuments* (Burman 1997, 280; Demas 1997b, 151; Iamandi 1997, 18; Mallouchou Tufano 1998, 212).

The charter considered conservation as a general approach and recommended limitation of restoration, which was then interpreted as reconstruction (Jokilehto 1996, 55-89). It instigated abandonment of stylistic restoration (Articles I and II), focus on maintenance and anastylosis (Article VI) of ancient ruins, safeguarding of the monuments setting, critical adoption of contemporary technology, interdisciplinary co-operation in restoration, international collaboration for legislation, and creation of archives with publications and special guidelines for restoration (Mallouchou Tufano 1998, 280; Iamandi 1997, 18; Burman 1997, 280-281). The concept was complemented with principles necessary for anastylosis practice, such as the integration of new materials (Article VI) and the use of materials and techniques (Article IV). Nevertheless, no direct connection was made between reconstruction and anastylosis in the charter (Dimacopoulos 1985, 16).

International Charter for the Conservation and Restoration of Monuments and Sites (1964)

The Venice Charter was adopted by the *Second International Congress of Architects and Technicians of Historic Monuments* in Venice in 1964 (Burman 1997, 281; Jokilehto 1996, 57-59; Demas 1997b, 152). It is considered the most influential international conservation document since the 1960s (Demas 1997b, 152).

The charter notes, in its Preamble, the individuality and diversity of heritage and recognises the different framework in which it should be preserved and protected, apart from the need for international agreement in restoration legislation (Burman

1997, 281; Dimacopoulos 1985, 18). Anastylosis is defined as '*the reassembling of existing but dismembered parts*' (Article 15). There are attempts to distinguish between conservation and restoration (Silva 1983, 10-11), as two different parts of the charter are entitled Conservation and Restoration.

The charter (Article 3) notes the importance of art and history as criteria for selecting monuments for preservation. It follows the line of the *Athens Charter* regarding the need to involve science in preservation (Article 2) but it defines limits in the use of modern technology (Article 10). Regarding new material, it asserts the importance of differentiating between new and original material (Articles 12 and 15), discussing the extent of permissible additions. Furthermore, the charter (Article 16) acknowledges the significance of documentation and scientific records and their availability to the interested professionals and members of the public (Silva 1983, 10-11).

Apparently, in both the *Athens* and the *Venice charters*, the principles guiding interventions are general, aiming at covering all types of intervention. They signify tendencies in monument preservation, rather than being attributed to separate intervention methods. With regard to the extent of intervention, the tendency appears to be the minimum possible.

In 1977, Professor Erder epitomised the critical views on the *Venice Charter* and analysed its articles and their validity. According to his commentary (Erder 1995, 29-30) on Article 15 and anastylosis, reconstruction was abandoned and protection of archaeological ruins was reduced to a general principle, anastylosis, because reconstruction on sites had damaged their balance and, in combination with environmental inadequacies, resulted in appearances of disorganised open-air museums. However, he confirmed that with the evolving concepts of cultural heritage, certain parts of this article had grown inadequate. Yet, he insisted that to produce a new charter is a demanding and perhaps unnecessary task, since it could be soon outdated.

On the other hand, Dimacopoulos (1985, 17) sustained that 'the term anastylosis implies a certain treatment of a ruined monument that *can be permitted* under certain conditions', such as the minimal use of new material for reintegration. He[1] proceeded in elucidating and critically analysing this article, urged by the ICOMOS Administrative Board in 1985 (AA, 1996, 45). He concluded that the extent and manner of integration of new material are not specified and are left to the discretion of those in charge. Additionally, the final paragraph of 'the article does not relate the recommended *minimum* use of new material to an integrated fragment but rather to the monument itself'. The aim is to avoid producing new members for replacing missing ones. The restorer is not allowed to utilise all fragments, unless he can prove that these fragments and their integrations are the minimum required to secure conservation of a monument and reinstatement of its form (Dimacopoulos 1985, 17-18). He actually focused on the use of new and original material that forms one of the most problematic aspects of restoration in general and anastylosis in particular.

The charter has been frequently criticised about its eurocentric views and its focus on stone monuments (Jokilehto 1998, 229; Jokilehto 1996, 72; Stovel 2001). However, it is rarely misapplied because, as Stovel (2001) stresses, conservation professionals 'do not use it as a dogma', but as a 'body of doctrine' or 'internationally accepted principles'. In the *9th General Assembly and Symposium of ICOMOS*, held in Lausanne in 1990, most participants found that the charter is still applicable and serves its purposes. Some restorers asked for change or revision and suggested certain modifications in its language or focus, or even its completion with commentaries or guidelines. There were problems specific to one country, discipline or material. Interestingly, the General Assembly judged that the charter had withstood 'time and its implementation in the world'. Considered as a monument itself, the charter was judged 'a living and dynamic document', 'a historical monument' that 'should be protected and preserved'. It needs 'no restoration, no renewal and no reconstruction', though it would be good to enrich it philosophically and theoretically, rather than practically (Dimacopoulos in AA 1996, 44; GA 1995, 50-52).

[1] Former Director of the Anastylosis Service of the Greek Ministry of Culture and member of ICOMOS.

Regardless, professionals and practitioners express thoughts about the charter's provision for anastylosis of ancient monuments. In this regard, their opinions were heard at a national conference held in Athens, Greece, in 1996 (AA 1996). It was recognised as a 'brief, flexible code of ethics that maintains its significance' (Bouras in AA 1996, 26). Yet, it was underlined that the fact that the charter was drafted by architects in charge of medieval and modern monuments (Bouras in AA 1996, 26), and 'the lack of guidance for classical monuments should not let us indifferent' (Dontas in AA 1996, 5).

Among the primary arguments was that the charter forms a general *regulation* (Kokkoliadis in AA 1996, 20), having unclear or inadequate articles. Hence, since each monument forms a special case, delineation of rules of general application would be a mistake (Bouras in AA 1996, 26-30). As Lavvas (in AA 1996, 79-80) underlined, it 'cannot give answers in specific problems conservators and restorers face'. It was also noted that 'the charters and conventions should not be interpreted according to what is believed and should not be realised through the power of boards and committees that manage monuments' (Holevas in AA 1996, 88).

A possible solution suggested was to prescribe commonly accepted intervention limits for classical monuments (Kokkoliadis in AA 1996, 20), since 'what is missing today is a *philosophy* on anastylosis of these monuments' (Dontas in AA 1996, 5). It was also recommended to provide rules about anastylosis *don'ts* in order to allow restorers a certain freedom and creativity, expressed in different levels and with different objectives than those of the original artist-creator' (Lavvas in AA 1996, 80). Additional suggestions included an anastylosis conference that would delineate practical rules to govern future interventions (Petrakos in AA 1996, 4), as well as proposals for formulation of a new charter dealing exclusively with anastylosis (Giraud in AA 1996, 73). In both cases, contributions of archaeologists and architects, but also artists would ensure a well thought-out result (Kokkoliadis in AA 1996, 21).

It is realised that the Venice Charter has been one of the most significant documents for architectural conservation and restoration. Yet, only a decade after its establishment strict critique and analysis of its significance as a guide in restoring monuments internationally. It is particularly striking that anastylosis of ancient monuments according to the charter was placed under scrutiny from professionals in the relevant field. The arguments deriving from both sides indicate that there is no perfect way in proceeding with restoration, but that it is essential to be critical of guiding theories and principles and of actions undertaken.

Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (1999)

The Burra Charter was first adopted in 1979, and since then it was revised in 1981, 1988, and 1999. It is based on the *Venice Charter*, adapting international principles to the values and needs of the Australian nation and heritage (Demas 1997b, 153), and includes three sets of guidelines for conservation practices (Burman 1997, 283; Marquis-Kyle and Walker 1992, 8; Truscott and Young 2000, 102). Primary issues are the shifting of focus from structures to places (Article 1.1), and the addressing of the *whys* of conservation (Preamble) (Marquis-Kyle and Walker 1992, 8). It has been revised without alteration of its fundamental elements in order to include advances in conservation and new understandings of values and planning processes (Truscott and Young 2000, 103).

The *Burra Charter* does not refer directly to anastylosis, but it is pioneering in its instigation of the concept of cultural significance for conservation (Article 1.2) and of respect for values (Article 5) and its recognition of the need to involve people in decision-making processes (Article 12). It includes definitions of conservation, preservation, restoration, reconstruction, adaptation, and use (Article 1). It endorses the use of knowledge, skills, and disciplines that can contribute, while traditional techniques and materials are preferred for the conservation of significant fabric (Article 4). The setting is important (Article 8) and additions are accepted, following the lines of the *Venice Charter*, but always in relation to cultural significance (Article 22). Publicly available documentation and records of actions are essential too (Articles 31, 32).

ICOMOS New Zealand Charter for Conservation of Places of Cultural Heritage Value (1992)

It is an adaptation of the *Venice Charter* to the cultural heritage of '*indigenous and more recent peoples*' of New Zealand and sets out principles to guide conservation of places of cultural heritage value (Preamble). Its aim is the application of indigenous methodologies (Article 3), while it endorses respect for existing evidence and historical setting (Articles 5 and 6). Similarly to the *Burra Charter*, it characterises every intervention as a conservation process (Article 13), including definitions of restoration, reconstruction and reassembly (anastylosis) (Article 22).

Nara Document on Authenticity (1994)

Authenticity was a key issue in the *Venice Charter*, though introduced without debate or definition. After Nara, the criteria of authenticity were determined by recognising cultural diversity and pluralism (Federspiel 1999, 169). Authenticity was defined as a concept relative to the identification of values according to their cultural context. In practice, authenticity should be assessed according to clusters of reference, such as 'form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling' (Jokilehto 1996, 21; Article 13).

The charter is not directly connected to anastylosis, but authenticity has long been discussed with relation to anastylosis. The *Nara Document* embraces and discusses the notion of authenticity in conservation (Article 10) This discussion resulted in the affirmation that authenticity is relative to identification of values, 'judged within the cultural context to which they belong' (Article 11).

Italian charters of restoration

These two national charters reflect how international conservation and restoration principles were adapted in Italian preservation practices.

The *Carta del Restauro Italiana (1931)* referred to anastylosis that should be applied in the so-called *dead* monuments (Article 3). The *Carta del Restauro (1972)* was distributed by the Italian Ministry of Public Education to archaeological services and institutes (Dimacopoulos in AA, 43) and includes four appendices as guidelines to interventions. Among its principles, the use of cement for completion of fragmented columns and of travertine or limestone for roman monuments is suggested, showing the acceptance of products of modern technology for integrations in accordance with the *Venice Charter*.

APPENDIX D (APPENDIX TO CHAPTER 4)
THE HISTORY AND ANASTYLOSIS OF THE CASE STUDIES FROM GREECE

D1. The Erechtheion and the Parthenon at the Acropolis of Athens

D2. The Avaton or Enkoimeterion and the Propylon of the Gymnasium in the Sanctuary of Asklepios at Epidauros

D3: The Hellenistic Stoa at the Acropolis of Lindos, Rhodes

APPENDIX D1: THE ERECHTHEION AND THE PARTHENON AT THE ACROPOLIS OF ATHENS

D1.1 Introduction to the Acropolis monuments and the current anastylosis projects

For almost 2500 years the Athenian Acropolis stands as an embodiment of the highest achievements in western art and architecture, continuing to capture the imagination of visitors (Economakis 1994a, 9).

D1.1.1 History of the site

The natural rock formation of the Acropolis is interwoven with a 5000-year-old history. From the 13th century BC until the early archaic period, a ‘Cyclopean’ circuit wall enclosed the upper part of the rock whose base was the site of a Neolithic community (Korres 1994c, 35-37). The Acropolis was the cradle and cultural epicentre of the city of Athens, and flourished greatly from the Archaic till the 3rd century AD. During the 8th and 7th centuries BC, numerous ancillary buildings and a few temples existed, probable predecessors in both location and ritual function of the classical buildings (Hopper 1971, 38; Korres 1994c, 37-39). Between 447 and 438 BC, a major programme initiated with the construction of the classical Parthenon. Immediately afterwards, works started on the Erechtheion and Propylaea (Korres 1983a, 131; Korres 1983c, 7; Korres 1994c, 41-47). The political and economic decay of the city after the 4th century BC is embedded in the history of the Acropolis monuments (Korres 1994c, 47-48).

At the end of the 4th and beginning of the 5th century AD extensive demolitions of temples and other ancient buildings were carried out while the major monuments were transformed into Christian churches or palatial residences, or monuments of their religions. During the next two centuries the Acropolis was a place virtually forgotten by Europe and only after the mid-17th century there would be new testimonies from visitors. In 1687 the Acropolis was used as battlefield among the Venetians and the Turks (Korres 1994c, 48-51).

D1.1.2 Description and significance of the site and the monuments

The Acropolis is a well-organised example of the ancient Greek temenos, consisting of freestanding temples, religious structures, and large votive offerings, located on an elevated landmass. The standing monuments (Parthenon, Propylaea, Erechtheion and Temple of Athena Nike) are unmatched in structural clarity, aesthetic balance and architectural refinement (Economakis 1994b, 17-19).

D1.1.3 History of excavations, interventions and studies

The two sieges of Acropolis during the War of Independence had reduced to rubble the Byzantine town covering the fortified Acropolis. The ancient monuments stood impressively, though seriously damaged (Casanaki and Mallouchou 1985, 12; Mallouchou-Tufano 1994b, 69).

Shortly after Greece became independent state, the Greek government and the Archaeological Society began to concern themselves with protection and display of the monuments, with small excavations, clearing of areas, demolishing of later structures, and consolidation and restoration work (Casanaki and Mallouchou 1985, 12; Mallouchou-Tufano 1994b, 71; Touloupa 1985, 8).

In 1834 L.von Klenze, a famous architect, proposed restoration of the monuments with use of ancient members, small infill operations easily discernible, removal of later additions, and maintenance of the buildings as ruins. His proposals were characterised by empiricism, a spirit of deference towards antiquity, and purism, and constituted the guidelines for interventions on the Acropolis throughout the 19th century. It was then that the Temple of Athena Nike was rebuilt becoming the first full reconstruction of a classical monument in Greece and in Europe (Casanaki and Mallouchou 1985, 12-14; Mallouchou-Tufano 1994b, 69-72; Mallouchou-Tufano 1998, 17-26). These operations were a matter of trial and error, unskilful and detrimental to the ancient material but they were done in a time when restoration principles had not yet been formulated (Casanaki and Mallouchou 1985, 14).

Throughout the 19th century Greeks and foreigners continued to work, reaching a high point in 1885-1890 with the great excavations of the Acropolis, led by P. Kavvadias, General Ephor of Antiquities (Casanaki and Mallouchou 1985, 16-18;

Mallouchou-Tufano 1998, 76; Touloupa 1985, 8). He had a specific programme: excavation of the Acropolis up to the natural rock surface; detailed drawing survey of the rock and the ruins; leaving certain important remains visible; clearing of remaining later buildings; gathering and ordering of scattered members (Casanaki and Mallouchou 1985, 16-18; Mallouchou-Tufano 1994b, 76-78); collecting and replacing fallen portions of the buildings (Paton 1927, 573-575).

A strong earthquake in 1894, which caused damages to the Parthenon opisthonaos, led to the decision to proceed with restoration. General supervision was charged to researchers Penrose, Durm, and Magne, while immediate supervision was entrusted to the 'Committee for the Conservation of the Parthenon', with representatives of the administration, the academic world, and architects of foreign archaeological schools. The engineer of the Ministry of Public Works, N. Balanos, joined them, immediately taking direction and gradually extending his activities to the other monuments. He oversaw interventions in the Parthenon (1898-1902), the Erechtheion (1902-09) and the Propylaea (1909-17) and in the Athena Nike Temple on the eve of the Second World War (Bouras 1983a, 154; Casanaki and Mallouchou 1985, 18-20; Harrington 1995, 45; Korres 1989a, 13-15; Mallouchou-Tufano 1994b, 80-81; Mallouchou-Tufano 1998, 76-226; Paraschi and Toganidis 2002, 15).

Balanos acted in a period when new concerns had arisen in Europe in the restoration field, thanks to theories that called for scientific and critical approaches. However, primary goal of his interventions remained the elevation of the monuments' artistic and environmental values, while his methods continued to be empirical and improvised. He relocated scattered fragments, without carefully studying and documenting his work. The limit of his interventions depended on the number of identified ancient members. He used Pentelic marble for completion and replacement of ancient parts. In order to achieve a better, in his view, chromatic consistency between new pieces and ancient members he used reinforced concrete, treated the final surface differently or inscribed the intervention date. He even created new pieces by assembling ancient fragments of various provenances from which the broken surfaces were cut to create flat contact surfaces (Casanaki and Mallouchou 1985, 18-19; Mallouchou-Tufano 1994b, 82; Mallouchou-Tufano 1998, 230). He also used common metal ties of random size and composition, cast poorly or not at all in lead or covered with cement plaster, and built large metal rods, plates and iron beams into members for structural reasons, destroying large masses of ancient material (Harrington 1995, 45; Mallouchou-Tufano 1994b, 82-83; Mallouchou-Tufano 1998, 231-232). Balanos won fame and glory both in Greece and abroad, his interventions establishing *anastylosis* internationally. His interventions succeeded in their immediate aesthetic goals but also led to loss and degradation of the authentic structure. Uncritical use of modern technology had fatal consequences. However, he should not be blamed for using reinforced concrete, as he was following the contemporary practice and applied the then technology in a way that was most impressive for the level of technical expertise at that time (Casanaki and Mallouchou 1985, 19; Mallouchou-Tufano 1994b, 83; Mallouchou-Tufano 1998, 230-231).

Afterwards, A.Orlandos, the pioneering architectural scholar and restorer headed protection of the monuments, intervening only on the Propylaea (Casanaki and Mallouchou 1985, 20; Mallouchou-Tufano 1994b, 83-84; Mallouchou-Tufano 1998, 234; Paraschi and Toganidis 2002, 16). His proposals collided with recent conceptions regarding the respect of the historical value of the monument, but the schemes were abandoned (Casanaki and Mallouchou 1985, 20; Mallouchou-Tufano 1994b, 84).

The extensive restorations at the end of the 19^{th} and beginning of the 20^{th} centuries gave the Acropolis monuments the appearance they have today (Casanaki and Mallouchou 1985, 8). The post-war era was sealed by the danger of collapse of the buildings, feared by the cracking and breaking of marble pieces, due to oxidation and expansion of the ironwork incorporated by Balanos (Casanaki and Mallouchou 1985, 20; Mallouchou-Tufano 1994b, 84; Mallouchou-Tufano 1998, 233; Touloupa 1985, 8). In 1960, the Acropolis Ephorate was responsible for protection of the monuments, through a series of conservation works, such as consolidations, joining of fragments and chippings, replacements of iron ties with copper ones, and draining of building floors (Casanaki and Mallouchou 1985, 20; CCAM 1985, 27; Mallouchou-Tufano 1994b, 85).

D1.1.4 Current interventions

In the succeeding years, a series of reports made by specialists and technical advisors was followed by an alarming exposé of the deteriorating state of the monuments by UNESCO scientists in 1971. The Greek Ministry of Culture directed the Acropolis Ephorate to take urgent protective measures. The magnitude of the problems eventually required the formation of a special task force, the Committee for Conservation of the Acropolis Monuments (CCAM), invested with the necessary authority to carry out interventions in 1975. Ever since, conservation and anastylosis work is carried out under the supervision of CCAM in co-operation with the Acropolis Ephorate, and with the support of UNESCO (Bouras and Zambas 2001, 7; Casanaki and Mallouchou 1985, 20; CCAM 1977, 9-11; CCAM 1985, 27; Economakis 1994a, 9; Ioannidou in SRAM 2001; Korres and Bouras 1983, 1; Mallouchou-Tufano 1994a, 13; Mallouchou-Tufano 1998, 230; Touloupa 1985, 8). In 2000, the Service for Restoration of the Acropolis Monuments (SRAM) was established as the group responsible for conducting the anastylosis (Bouras and Zambas 2001, 7; Bouras in SRAM 2001; Garezou in SRAM 2001). The Greek state and the European Community jointly finance the works (Bouras and Zambas 2001, 7; CCAM 1977, 11; CCAM 1985, 28-29; Mallouchou-Tufano 1994a, 13).

Principal aim is to deal with the main problems affecting the monuments and amend the various types of structural damage (Bouras and Zambas 2001, 7-10; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13; Zambas 1994a, 107). CCAM concentrated on assembling as much information as possible in order to create sound scientific base for its work, exhaustively studying the monuments and the problems that afflict them (Economakis 1994a, 9; Papanikolaou 1989, 8-10).

Some of the structural damage was primarily due to oxidation and expansion of uncoated iron ties and cramps incorporated into marble members during the past restorations. These had resulted in numerous new fractures, ruptured members, displacements, and discoloured stone surfaces. Another reason was the deterioration of marble surfaces due to chemical changes caused by atmospheric pollution, especially acid rain and carbon dioxide produced by fuel emissions. Natural (earthquakes, fires, ice, wind, and rain) and biological factors (micro-flora and micro-fauna organisms and sulphur-oxidating bacteria) also affected the marble.

Electrochemical deterioration caused 'sulphation' of marble, a process during which it turns into gypsum. These basic problems were linked with further problems of static sufficiency and earthquake resistance (Bouras 1994a, 101; Bouras and Zambas 2001, 7-17; Calligas in Economakis 1994, 185; Casanaki and Mallouchou 1985, 58-59; Economakis 1994a, 9; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13; Mallouchou-Tufano 1994b, 84; Plytas in CCAM 1977, 8-9; Skoulikidis 1994b, 14-20; Skoulikidis in CCAM 1977, 20-21; Touloupa 1985, 8; Zambas 1994a, 107). Action was unavoidable. Drastic measures had to be taken urgently (Bouras 1994a, 101; Bouras and Zambas 2001, 7-10; Economakis 1994a, 9). Studies of damages began in 1975 (Casanaki and Mallouchou 1985, 58).

The most up-to-date methods of structural analysis determined the damages. Interventions are undertaken in the most affected areas (Casanaki and Mallouchou 1985, 38-39; CCAM 1977, 13-14; Zambas 1994a, 107). The only way to stop the iron rusting is to remove all iron fastenings incorporated in the buildings, by dismantling the restored parts (Casanaki and Mallouchou 1985, 58-59; Skoulikidis in CCAM 1977, 19-21). During the course of restoration, each monument is carefully dismantled and the pieces are treated individually on the ground (Bouras and Zambas 2001, 11; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13). The characteristic articulated system of construction of classical buildings facilitates this sort of work (Ioannidou in SRAM 2001). In the dismantled parts, joining of broken fragments is done with Portland cement and ties made of titanium, a metal that behaves similarly to iron but is much lighter and does not oxidise, in the ancient tie-holes (Bouras and Zambas 2001, 11; Casanaki and Mallouchou 1985, 59; Economakis 1994a, 10; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13; Skoulikidis in CCAM 1977, 19-21; Zambas 1994a, 108). The most flexible tested method of structural design is used. With regard to the dimensions of ties and cramps, their design corresponds to the determined strength of the ancient marble, significantly reducing the size of metal elements incorporated into ancient members (Zambas 1994a, 108).

Wherever necessary, for structural reasons and for completion of forms, certain blocks are supplemented with new marble (Bouras and Zambas 2001, 11-15; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13). Additions are the minimum possible and made from Pentelic marble so that they withstand time and are compatible with original parts. A pantograph is used to transfer the points of the marble surface to the new elements. The copying is taking place from casts (Bouras and Zambas 2001, 15; Ioannidou in SRAM 2001). New additions are differentiated in colour. The passage of time or the application of artificial patina will eliminate the differentiation (Bouras and Zambas 2001, 16; Skoulikidis 1994b, 33-34). In non-visible parts of the members, the restoration date is inscribed (Bouras and Zambas 2001, 16).

Improvement of static sufficiency and anti-seismic protection are governed by the same theoretical principles applied to interventions, i.e. concern for the structural characteristics, economy regarding the extent of reinforcements, requirement for reversible operations, damage of connections, not original materials, in possible mechanical strains (Bouras 1994a, 101; Bouras and Zambas 2001, 15; Casanaki and Mallouchou 1985, 38-39).

With regard to the deterioration of marble surfaces, experiments are undertaken in the laboratories at the National Polytechnic University of Athens. Research is focused on the effects of biological deterioration, reaction of marble to atmospheric sulphur oxides, on the effects of coating the marble with an organic or inorganic substance, on efforts to convert the gypsum back into calcium carbonate, and on ways of cleaning the marble surface without harming it (Bouras and Zambas 2001, 17; Casanaki and Mallouchou 1985, 38-39; CCAM 1977, 13-114; Dogani *et al.* 1994, 58; Pantazidou 1994, 41-44). Other laboratory studies include the use of gammagraphy on marble members to reveal information about internal cracks and unknown metal inserts and a study on the effectiveness of ultrasound to keep pigeons away from the monument (Casanaki and Mallouchou 1985, 38-39; Hatziandreou and Ladopoulos 1994, 45; Karakatsanis 1994, 46).

Generally, conservation work focuses on marble surfaces and has, since 1986, constituted a separate program, conducted and co-ordinated simultaneously with the structural restoration. The conservation project includes active and passive conservation (CCAM 1977, 13; Dogani *et al.* 1994, 49). *Active conservation* consists of consolidation interventions though actions of cleaning and protection, such surface treatment, joining of superficial fragments and flakes, spraying or impregnation of the damaged stones with inorganic materials (Bouras and Zambas 2001, 17; Dogani *et al.* 1994, 49-58; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13; Skoulikidis 1994b, 32-33). *Passive conservation* consists of interventions of preventive nature, such as transferring architectural sculptures and relieves from the monuments to the museum and placing them in inert nitrogen environment. Copies are made of special cement whose colour and texture matches those of the monument (Bouras 1994a, 101; Bouras and Zambas 2001, 14; Dogani *et al.* 1994, 49; Economakis 1994a, 11; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 13).

Conservation documentation is undertaken, including photographs of each member before, during and after conservation, and has been computerised for easy access and processing (Dogani *et al.* 1994, 62-64).

The gathering of scattered fragments, either used in new structures and past restorations, or found in museums or gathered in piles near or inside the monuments, led to identification of a vast number of pieces that belong to the main monuments. Their study initiated in 1977 and their recording comprised systematic drawings and photographs, data on their current and new location and their dimensions, research for their identification (Casanaki and Mallouchou 1985, 54; Bouras and Zambas 2001, 11-20; Ioannidou in SRAM 2001; Mallouchou-Tufano 1994a, 14). They were in dire need of preservation but it was decided that their repositioning on the building would afforded the fragments greater degree of protection and made them more accessible (Bouras 1994a, 102; Economakis 1994a, 9-11; Mallouchou-Tufano 1994a, 13).

A wide-ranging programme of documenting the status quo, aims at complete knowledge of the monuments before any intervention is carried out. The programme comprises detailed measurements, plans and drawings, photography. Photogrammetric records give the general surface morphology and the damage from fractures. Conventional measuring systems and systematic recording of the works by photography and cinematography supply specific information. Description of the monuments' condition, systems of recording information, bibliographical files, photographs and drawings from archives and libraries are included (Alexopoulos

2002, 10-11; Bouras 1985a, 10; Bouras and Zambas 2001, 20; Casanaki and Mallouchou 1985, 38-40; CCAM 1977, 12-13; Mallouchou-Tufano 1994a, 13-14).

The detailed documentation will be collected and stored in an archive and be disseminated through publications, newspaper articles and lectures, according to the international standards (Bouras 1985a, 10; Bouras and Zambas 2001, 20; Casanaki and Mallouchou 1985, 40; Mallouchou-Tufano 1994a, 13-14). Interestingly, provisions are made for the public information by publishing newsletters and by organising photographic exhibitions, the Centre for the Acropolis Studies, museum exhibits, and educational programs for schoolchildren (Bouras 2002, 19; Bouras and Zambas 2001, 20; Ioannidou in SRAM 2001; Korres 1994d, 111; Mallouchou-Tufano 1994a, 14; Maurommatis 2003). Another example is the creation of the website http://ysma.culture.gr which details the undertaken anastylosis works. Information technology was used in drawing up the first restoration studies and for handling the documentation (Alexopoulos 2002, 10-11).

Selective restoration of secondary edifices aims at re-establishing a level of complexity that approximates the original urban character of the Acropolis (Fatouros in Economakis 1994, 186). The Committee has also done extensive research on the construction of ancient Greek temples. Historical research in architecture and topography is carried out largely (Korres 1994a, 179).

Intensive studies of the acropolis rock mass, diagnosis of causes of deterioration, and steps to cope with them were also undertaken. A geo-technical study in 1977 designated areas around the slopes that required immediate consolidation (Bouras and Zambas 2001, 29; Casanaki and Mallouchou 1985, 30; CCAM 1977, 13; Ioannidou in SRAM 2001). The aims are to save invaluable ancient traces and cuttings, facilitate circulation of visitors and make the archaeological area easier to understand. Traces of ancient paths and gathering places have been determined and their approximate re-establishment is proposed (Casanaki and Mallouchou 1985, 31; CCAM 1977, 13).

Installation of the work-site was part of the general study that preceded the operation, examined all problems and included the choice of technical equipment, organisation of working areas (Casanaki and Mallouchou 1985, 74; Ioannidou 2002, 1). Prerequisites and aims that have to be fulfilled are: the technical means being handy, easy to install and operate at any moment; the appearance of installation inducing the least possible aesthetic interference with the monuments; preservation of the monuments and ancient remains; safety of workmen and visitors while work is going on. However, basic criterion for choosing the work-site equipment is whether it can leave the monuments completely unharmed after work is finished (Ioannidou 2002, 1-3).

Among the technical equipment of the work-site are hoisting systems (cranes, bridge cranes) for dismantling and resetting architectural members, equipment for structural restoration (pantographs, pointing devices, specially built fixtures for repairing fragments of ancient members), systems for moving stones and transporting material and equipment, equipment for measuring and plotting, laboratories, workshops and offices for the personnel, and special tools. Continuing development of technology and types of machinery are adapted to the conditions of each monument (Casanaki and Mallouchou 1985, 74; Ioannidou in SRAM 2002, 1-2). For deciding on technology, the architect of the Parthenon restoration researched the respective methodology of ancient workmen (Oikonomopoulos 2002, 4-7).

The CCAM consists of specialists and scientists of repute, in particular classical archaeologists, architects, architectural historians, conservators, civil and structural engineers, chemical engineers, and other specialists (Bouras and Zambas 2001, 7; CCAM 1977, 11; Ioannidou in SRAM 2001; Korres and Bouras 1983, 1; Mallouchou-Tufano 1994a, 14; Mallouchou-Tufano 1994b, 85; Touloupa 1985, 8). Most marble workers come from Greek islands where there is an age-old tradition of working marble, using the same methods and tools (Touloupa 1985, 9). The Committee collaborates with the National University of Athens for laboratory research, as well as with many archaeological institutes and foreign archaeological schools in Greece (CCAM 1977, 11).

Since the members of the Committee are specialists in so many different fields, precautions have been taken to ensure that decisions are taken on objective levels. Hence, decisions are made collectively, and then a procedure is set up, whereby the study and planning phases are checked and tested in international scientific meetings and in the top ranking advisory archaeological committee of the Ministry of Culture (Bouras and Zambas 2001, 20; Casanaki and Mallouchou 1985, 80; Harrington 1995, 45; Korres and Bouras 1983, 1; Touloupa 1985, 8).

Emerging problems are fiscal and administrative, as well as related to organising working crews and selecting personnel (Bouras 1994a, 103; Bouras in SRAM 2001).

D1.1.5 Philosophy of the current anastylosis approaches

CCAM has tried to address the question about the difference between the monuments from classical antiquity and other architectural heritage monuments, while remaining faithful to the stipulations of the *Venice Charter*. It has thereby determined that classical monuments have a large historical and aesthetic value and relatively small functional value, are constituted primarily of architectural stone members that have inherent structural and aesthetic integrity, have become widely known in their present ruinous state, and have lost their original protection against adverse weather conditions. These particularities led the Committee to promote five new principles, which complement the charter. Generally, all work is carried out according to the *Venice Charter*. The established principles are: reversibility; maintenance of integrity and autonomy of architectural elements and basic structural functions, ensuring self-protection of the ruin from natural forces; and limitation to a minimum of changes to the general appearance of the monument (Bouras 1994b, 89-91; Casanaki and Mallouchou 1985, 80; Mallouchou-Tufano 1994a, 13-14).

Interestingly, it is maintained that if the built environment is to be rescued, we must look upon the Acropolis monuments as potent bearers of meaning on a cultural, civic, and architectural level. Whether one chooses conservation, restoration, or reconstruction, what matters is not so much the extent of restitution but our willingness to let it inform our everyday life (Economakis 1994, 223).

In view of the current anastylosis works, the Erechtheion and the Parthenon will be examined.

D1.2 The Erechtheion

D1.2.1 Introduction

The Erechtheion forms an innovative architectural synthesis of the late classical antiquity (Papanikolaou 1989, 1), standing midway on the north of the Acropolis and close to the surrounding wall (Camp 2001, 93; Paton 1927, 3).

D1.2.1.1Description and history of the Erechtheion

The Erechtheion, built between 421 and 406 BC, replaced the neighbouring limestone temple of Athena and combined multiple pre-existing functions and cults (Athena, Poseidon-Erechtheus, and Hephaistos) (Camp 2001, 93-95; Hopper 1971, 101; Korres 1994c, 46; Paton 1927, 3).

The rock on which it stood and the previous terracing determined its curious plan. Its qualities are embodied in the combination of formal complexity, harmony of diverse constituent elements, and suppleness of architectural and sculptural components (Economakis 1994b, 18; Hopper 1971, 98). The architect chose to build the temple in the lighter, more ornate Ionic order (Camp 2001, 94).

The temple stood on a rectangular platform and consisted of a rectangle cella, divided unequally by walls into three sections (Hopper 1971, 101). The interior plan is obscured by later re-buildings (Camp 2001, 95). On the east was a portico of six Ionic columns with a coffered stone ceiling and an ornamented door in the wall, which gave access to the eastern section, connected with the cult of Athena. The western side was entered by a north porch with four Ionic columns on the front, and one behind each corner. A doorway led to the interior. Two entrances to the middle section pierced the eastern wall. The Caryatid porch was attached to the southwest corner of the structure. It consisted of a marble podium on which the figures of statuesque young women stood, supporting a flat roof with a coffered stone ceiling (Camp 2001, 94-99; Hopper 1971, 101-103; Paton 1927, 3).

The temple carried two sculpted friezes, one around the top of the building and a separate one above the north porch. Their backgrounds consisted of slabs of dark grey marble to which relief figures of white marble were pinned. Though several fragments of the figures have been recovered, the subjects of the scenes are unknown

(Camp 2001, 98). The porous foundations were laid in ashlar masonry. A different porous stone from Aegina was used in the north and south frieze. The visible parts of the building were built from Pentelic marble (Paton 1927, 5 and 181).

The unusual design was clearly influenced by two factors, the steeply sloping ground, as in the east and south is higher than on the west and north, and the form of earlier buildings, which were not permissible to remove (Camp 2001, 95; Korres 1994c, 46; Paton 1927, 4).

The initial form of the monument was repeatedly altered due to consecutive uses and arrangements, as well as serious damages. It caught fire twice, once after its completion and in 25BC, and underwent essential changes during its repair. Changes in its later history include its conversion to a basilica in the 6th century AD, its incorporation in the Duke’s palace during the Frankish times, and its conversion into a house during the Turkish conquest (Camp 2001, 99; Harrington 1995, 45; Hopper 1971, 98; Korres 1994c, 48; Papanikolaou 1989, 1). In the 19th century Lord Elgin extracted a prostasis column, one Caryatid, architraves, capitals and one coffered slab (Camp 2001, 99-100; Papanikolaou 1989, 1).

D1.2.1.2 History of excavations and interventions

In 1834 the north porch was excavated by Ross (Casanaki and Mallouchou 1985, 14; Paton 1927, 560). In 1837 Pittakis excavated the monument. By 1840, he had re-erected a large part of the north and south walls and the northwest anta of the building, and restored the western columns of the north porch and the engaged columns of the western wall (Casanaki and Mallouchou 1985, 14-15; Hopper 1971, 98; Mallouchou-Tufano 1994b, 72-73; Mallouchou-Tufano 1998, 27-28; Papanikolaou 1989, 1; Paton 1927, 561-654). At the Caryatid Porch he repositioned the fourth Caryatid, which was completed by Imhoff, who repositioned the head recovered in recent excavations (Casanaki and Mallouchou 1985, 15; Mallouchou-Tufano 1994b, 73; Mallouchou-Tufano 1998, 28; Paton 1927, 565). The exterior building received the form, which retained until 1903. After 1840, works were confined to partial restoration of the side porticoes and clearing of the surroundings (Paton 1927, 561). Pittakis was zealous in his undertakings, but without previous training, while his writings show lack of observation and accurate record. He simply used ancient blocks lying around on the ground, without bothering to determine their exact original position (Casanaki and Mallouchou 1985, 15; Mallouchou-Tufano 1998, 38; Paton 1927, 561).

In 1844-1845 the ruins of the Turkish gunpowder arsenal were removed from the north portico (Casanaki and Mallouchou 1985, 14; Mallouchou-Tufano 1994b, 72; Paton 1927, 566). Paccard worked on the restoration of the Caryatid Porch between 1846 and 1847. He repositioned the sixth Caryatid, restored by Andreoli, and placed a clay cast, gift of the British Museum, in the place of the third Caryatid, which had been carried off by Lord Elgin. He completed in marble the architraves, orthostates and the cornice of the podium of the portico and part of the north side entablature. He also put up columns to replace brick and masonry props between the Caryatids, which up to that time had supported the superstructure (Casanaki and Mallouchou 1985, 15; Mallouchou-Tufano 1994b, 73; Mallouchou-Tufano 1998, 33; Papanikolaou 1989, 1; Paton 1927, 567-568). Paccard introduced new methods of restoration, such as chiselling fractured surfaces on ancient members to facilitate their completion with new marble, or embedding new metal ties in the ancient stones, both of which had detrimental effects on the originals (Mallouchou-Tufano 1994b, 74; Mallouchou-Tufano 1998, 40).

By 1860 the excavations had reached the Christian floor of the building, revealing graves and the west chamber reservoir, while the main body and fragments of the sixth Caryatid together with the head of the fourth were brought to light. In 1862, Botticher excavated inside and around the Erechtheion (Casanaki and Mallouchou 1985, 14-16; Mallouchou-Tufano 1994b, 73-75; Paton 1927, 569-572). So far, the interior had been cleared of fallen blocks and rubbish, the walls were partially rebuilt, and the porticoes freed from modern constructions. Yet the entablature and ceiling of the western half of north portico, the columns of West Façade were still on the ground, and the roof of the Caryatid porch lacked one of the four great blocks (Paton 1927, 572).

Balanos oversaw interventions in the Erechtheion between 1902 and 1909 (Casanaki and Mallouchou 1985, 18; Hopper 1971, 98; Mallouchou-Tufano 1994b, 80; Mallouchou-Tufano 1998, 119; Papanikolaou 1989, 1; Paton 1927, 575). He restored the south wall to full height and the western elevation by repositioning the largest part of the entablature and the northern pediment section. In the eastern façade he restored the southeast column, the architraves and the cornices, and reassembled the frieze from fragments. He dismantled and reassembled the northwest pilaster. In the north portico he repositioned all architraves, the largest part of the frieze, backing blocks, and cornices. He completed with new marble the northwest column and the middle column of the western side and restored the pediment tympana, as well as the ancient roof by repositioning the beams and coffers (Casanaki and Mallouchou 1985, 18; Mallouchou-Tufano 1994b, 81; Mallouchou-Tufano 1998, 123-124; Papanikolaou 1989, 1; Paton 1927, 577-578). In the Caryatid porch, he replaced Paccard's restorations of the podium and the architraves, returned all coffered roof slabs to their original positions, conserved and repaired the Caryatids and relieved them of the weight of the roof by means of an iron beam built into the architraves, and through iron posts placed between the statues (Casanaki and Mallouchou 1985, 18; Mallouchou-Tufano 1994b, 81; Mallouchou-Tufano 1998, 126; Paton 1927, 578-579). Today, critical assessment of Balanos' work stresses the unlimited use of iron with its catastrophic results. He should also have paid more attention to the damage in the Caraytid Porch caused by Paccard's use of iron components, which he replaced with brass (Casanaki and Mallouchou 1985, 19).

From 1912 until 1927, the American School of Classical Studies at Athens was given permission to clear further parts of the building in order to obtain information on some obscure matters (Paton 1927, 579).

In 1975, the main priority of CCAM was the conduct of studies and restoration works on the Erechtheion. The anastylosis study was formulated, with a description of the preservation state of the monument and proposed measures to confront the problems by taking into account the accepted scientific methodology and the international theoretical framework. It was published and then unanimously approved in the First International Conference for the Conservation of the Acropolis Monuments in 1977 (Casanaki and Mallouchou 1985, 80; CCAM 1977, 7; Papanikolaou 1989, 2; Touloupa 1985, 8). In the international conference, various Greek and foreign experts participated: archaeologists, architects, anastylosis specialists, civil engineers, seismologists, and chemical engineers (CCAM 1977, 7;

Touloupa 1985, 8-9). Conservation and restoration works undertaken by the CCAM lasted from 1979 to 1987, constituting the first organised attempt of the Greek State to restore the monument after the Second World War (Mallouchou-Tufano 1994a, 14; Papanikolaou 1994, 137; Papanikolaou 1989, 2; Touloupa 1985, 9).

D1.2.1.3 State of preservation

Sixty years after Balanos' anastylosis, the Erechtheion presented serious problems. Its architectural members were shattered because of oxidation and expansion of the metal joints. The roofs of the façades were ready to collapse. Only a few members were fragmented in one piece, normally they were fragmented from 2 to 135 pieces (Papanikolaou 1989, 1-2; Papanikolaou 1994, 137). Some architectural members were detached from the building by Lord Elgin in the 19th century (Papanikolaou 1989, 1).

Dismantling the monument showed that entire parts of the structure had been repositioned in a totally random manner. The percentage of erroneous replacements surpassed the 90% of the authentic material (Papanikolaou 1989, 4; Papanikolaou 1994, 143). Moreover, the surfaces of the monument presented intense deterioration from atmospheric pollution (Papanikolaou 1989, 1). The Caryatids were suffering worse, being in immediate danger of turning into plaster, while most of their details had disappeared (Plytas in CCAM 1977, 9).

D1.2.2 Theory behind the anastylosis proposal

D1.2.2.1 Reasons and aims of the anastylosis - Results

Primary reason for intervening was the need to amend and revert the devastating consequences of previous restorations, especially those undertaken by Balanos, and to tackle the effects from atmospheric pollution on the marble surfaces (Papanikolaou 1994, 137). Main aim was to remove contradictions created by application of past expertise and to alter the image of the monument as resulted from the random re-assembly of architectural elements (Papanikolaou 1989, 5).

The reason for choosing the Erechtheion first among the Acropolis monuments was that it posed the most urgent problems (Casanaki and Mallouchou 1985, 80; Touloupa 1985, 8). It was in greater need of stabilisation and there was less scope for restoration as little ancient material was on the ground. Moreover, it is a much smaller monument compared to the others. Thus, it was a convenient choice to make a quick start for rescue work and acquire essential experience for further restorations (Korres and Bouras 1983, 664).

With replacing ancient fragments in their original locations, the Erechtheion became more legible. Today it is possible to accurately discern the later historical interventions, namely those from the Roman and Christian period, while its qualitative elevation has been achieved (Papanikolaou 1989, 4-5; Papanikolaou 1994, 147).

D1.2.2.2 Principles and theoretical framework of the anastylosis

The work undertaken was considered as restoration of a restoration (Zambas 1994a, 107). The principles of the Venice Charter were followed. Hence, article 2 was respected through the multidisciplinary synthesis of the CCAM and their collaborators. The removal of the Caryatids to the Acropolis Museum was in accordance with article 8, as better protection would be achieved and it was a temporary and reversible solution that respected the architecture and structure of the building. In the case of article 9 a certain disadvantage was presented, because non-intervention to original parts was impossible, since the architectural members found scattered around the monument had to be incorporated in it. New additions were included with the utmost respect based on the exceptional craft of the stonemasons. A harmonic combination of science and expertise gave a new dimension to article 10. Article 11 was followed in removing materials not considered valuable and preserving elements of the Christian phase. Moreover, incorporation of previous restoration phases in the recent anastylosis was considered a historically justified action. Desirable differentiation, according to article 12, between new and original material was achieved with discretion and is obvious only in close inspection. It was achieved with different texture between new and old stones and with the inscription of the anastylosis date on the new members. Commitment to produce a publication, as endorsed in article 16, was fulfilled by providing analytical information on every member during the building history (Bouras in CCAM 1977, 27-29; Papanikolaou 1989, 2-6).

Three further principles were followed (Bouras in CCAM 1977, 29). Reversibility permits the relatively easy dismantling of restored parts in order to replace them with original material (Papanikolaou 1994, 149). This principle was secured with minimum intervention on original members and with detailed recording. Minimum alteration of the appearance of the monument was based on the familiarisation and knowledge of the form of Erechtheion as preserved so far and as it appeals to a collective sensitivity, which could be insulted. The last principle is related to the increase of the didactic values of the monument, since visitors would be able to understand the building as fully and easily as possible (Bouras in CCAM 1977, 29).

D1.2.3 The anastylosis programme

D1.2.3.1 The general strategy followed

The anastylosis study comprised extensive research on the alterations the monument had undergone during its history and on tracking down information about previous restorations, their methods and materials. Publications and archival material were consulted, while modern technology was employed. Architectural, static and physiochemical problems were analysed too (Casanaki and Mallouchou 1985, 80-92). The works were recorded in great detail in drawings, photographs and measurements (Papanikolaou 1989, 2; Casanaki and Mallouchou 1985, 81).

Primary goal was the removal of Caryatids and their placement in the Acropolis Museum to protect them from the disastrous effects of atmospheric pollution and avoid irreversible damages. The sculptures were placed inside a glass enclosure with controlled nitrogen atmosphere and according to their arrangement in the monument (Bouras 1994a, 101-103; Dontas in CCAM 1977, 17; Economakis 1994a, 11; Korres 1994c, 37; Mallouchou-Tufano 1994a, 13; Papanikolaou 1989, 2; Touloupa 1985, 9). Copies were made, after conducting various experiments, of special cement, whose colour and texture matches those of the monument (Bouras 1994a, 101; Dontas in CCAM 1977, 17; Economakis 1994a, 11; Mallouchou-Tufano 1994a, 13; Platon in CCAM 1977, 14). Exact copies of original elements from the northeast corner of the east porch (now in the British Museum) were placed in their respective positions. These solutions elevated the monument and improved its general appearance while providing greater resistance to seismic activity and augmenting the didactic values (Bouras 1994a, 103; Papanikolaou 1994, 147).

Various problems regarded the form and construction of the monument together with static problems (Bouras in CCAM 1977, 30-34). However, the physico-chemical problems of corrosion and expansion of the metal joints and the steel frame employed by Balanos resulted in cracking the marble and presenting structural instability (Aggelidis in CCAM 1977, 22; Skoulikidis in CCAM 1977, 19). Metal joints were replaced by titanium ones by dismantling the monument (Casanaki and Mallouchou 1985, 81; Dontas in CCAM 1977, 16; Papanikolaou 1989, 2; Skoulikidis in CCAM 1977, 19-21; Touloupa 1985, 9). Marble surfaces suffering from intense deterioration were stabilised, after laboratory experiments (Skoulikidis in CCAM 1977, 19-21; Touloupa 1985, 9). Civil engineers of the CCAM undertook static analysis of the monument and proposed solutions (Aggelidis in CCAM 1977, 22; Zambas 1994a, 107).

The interventions were undertaken in areas most affected structurally. When damages were not critical for the structural behaviour of the building and there were no indications of progressive deterioration, no action was taken. About 720 members of the marble structure were removed, the majority of which were in a poor preservation state (Papanikolaou 1994, 137; Papanikolaou 1989, 2-3; Zambas 1994a, 107-108). Skilled marble workers cleared out clamps and mortar and cleaned out cuttings (Casanaki and Mallouchou 1985, 81). No sculpting was undertaken in original members and only old traces were used (Bouras in CCAM 1977, 28).

Systematic study of the ancient material proved that a great number of members had been placed in wrong locations during previous interventions, while an exhaustive study of the structural characteristics of the members made possible their correct repositioning. This, in turn, permitted restoration of the subtle architectural refinements of the ancient building. A combination of computer programs so as to find the correct locations was employed but it was not possible to avoid conventional assembly of members (Casanaki and Mallouchou 1985, 82; Papanikolaou 1989, 4-5; Papanikolaou 1994, 143).

Restoration of individual members was slow and careful, including use of white cement hidden ties made of titanium rods (Casanaki and Mallouchou 1985, 81;

Papanikolaou 1989, 3; Papanikolaou 1994, 143; Touloupa 1985, 9). Laboratory experiments for the compatibility of titanium and marble took place and solved problems relating to the joining techniques (Papanikolaou 1989, 3). One of the problems that emerged concerned the position of new joints but was resolved with reusing ancient cuttings (Korres 1994c, 43; Papanikolaou 1989, 4).

Stone completions were effected in new Pentelic marble with the help of pantographs (Casanaki and Mallouchou 1985, 81; Papanikolaou 1994, 143; Papanikolaou 1989, 3). This method was preferred because, despite the fact that some twenty thousand marble fragments have been collected from the Acropolis plateau, few could actually be assigned with any certainty to the Erechtheion, as techniques did not allow for a more accurate identification (Papanikolaou 1989, 3; Papanikolaou 1994, 143). All material foreign to the structure was removed and replaced by accurately sculpted elements. Objections were raised regarding the high number of small and large surfaces of new marble, but this was the inevitable result of the removal of foreign material (Papanikolaou 1994, 147). There was no sculpting in the original material. The principle of differentiation between new and old material was respected with different sculpting of new members and with inscribing of the construction date (Papanikolaou 1989, 3-4). Moreover, a substantial visual discrepancy relates to the extent to which new infill pieces harmonise with ancient elements on the interior. The new infill pieces were treated on their interior surfaces with shallow point marks, pronouncing a certain visual antithesis between ancient damaged material and contemporary stones (Papanikolaou 1994, 147).

After completion of works, the visitors were given the possibility of approaching the monument from its east and north sides. Another temporary path at the west, made that side accessible (CCAM 1990, 6-7).

D1.2.3.2 The anastylosis programme of the monument

The anastylosis programme was divided in five different phases (Papanikolaou 1989, 2). New interventions included restoration of stones from the north, west and south walls and from the Caryatids cornice of the podium, as well as of coffered slabs from the north porch roof. Reconstruction of the corner of the east porch was also undertaken (Aggelidis in CCAM 1977, 24-26; Bouras and Zambas 2001, 25;

Papanikolaou 1989, 4-6; Papanikolaou 1994, 147). Part of the Balanos' anastylosis was kept as a historical phase to avoid alteration of an imposed form of the monument (Papanikolaou 1989, 5).

Four further small programs will be undertaken, including the formulation of neutral flooring in the cella, after conservation of the lower parts of the side walls. The roof above the north porch will be restored from modern material, for rain protection. The sheltered courtyard, paved with slabs, at the north will be restored too (Bouras 2002, 16-17). In 1995, SRAM decided systematic conservation of the marble surfaces of the Erechtheion (CCAM 2003, 509-516).

D1.3 The Parthenon

D1.3.1 Introduction

The importance of the Parthenon to the history of art is unique. It was built under exceptionally favourable circumstances from political, economic and cultural points of view and represents the golden age of the classical spirit (Korres 1983a, 131).

D1.3.1.1 Description and history of the Parthenon

The Periclean Parthenon followed the unfinished older Parthenon in its form, while stone members prepared for the pro-Parthenon were used (Hopper 1971, 118; Korres 1983a, 132; Korres 1983c, 7; Korres 1994c, 45; Paraschi and Toganidis 2002, 22).

Kallikrates and Iktinos were the architects but the sculptor Phedias had all supervision. Construction began in 447 BC and the famous statue of Athena Parthenos was dedicated in 438. Work on the ornamental sculpture continued until 433/2. The classical Parthenon was a public votive offering to commemorate the victory at the battle of Marathon, completed as a monument to Athenian power (Camp 2001, 74; Korres 1983a, 132-134; Korres 1983c, 7; Korres 1994c, 45-46; Hopper 1971, 118-121).

It was erected in an extensive flat square as a refined example of octastyle peripteral Doric temple incorporating Ionic elements. Though the most refined example of Doric order, it incorporated Ionic elements (Camp 2001, 74; Economakis 1994b, 18;

Hopper 1971, 121-122; Korres 1983c, 7-18). Three elements set the building apart from others: plan, architectural refinements, and sculptural decoration (Camp 2001, 75).

The plan exhibits sophistication of design, since the temple seems monumental but scale is not increased (Camp 2001, 75). The peristyle had eight columns on front and back and seventeen on the sides (Camp 2001, 74; Hopper 1971, 121). Two porches, with coffered marble ceilings, stand before them (Hopper 1971, 121). The pronaos entablature, with its Ionic frieze, differed from the opisthonaos one (Korres 1983c, 5-129). The interior is divided into four parts: a front porch (pronaos) and a back porch (opisthonaos) with six Doric columns each, the 'hundred-foot' cella, and the back (Hopper 1971, 121).

The cella was divided into a nave and two aisles by two rows of ten Doric columns (Hopper 1971, 121). Two colonnades of superimposed columns supporting the ceiling were connected by a third colonnade of five transverse columns at the back, providing an architectural frame for the statue (Camp 2001, 76).

The walls are simple forms with a few elements of decoration (Korres 1983c, 29; Paraschi and Toganidis 2002, 22). Four parastades form the east and west end (Paraschi and Toganidis 2002, 22). The east wall windows are the most ancient of their kind and influenced Athenian and Hellenistic architecture (Korres 1983c, 32).

The temple was built of marble; wood was used for the inner ceiling, the doors and doorframes. The roofs were horizontal and coffered. Colour was much used (Hopper 1971, 121-122; Korres 1983c, 33-42).

The architectural refinements were related to the general architectural concept. They are slight adjustments in the construction, which free the temple from the straight horizontal and vertical lines of the Doric order and its static quality. The stylobate is not horizontal, making obvious the effect of this curvature. The columns incline slightly inward and taper upward on a curved line (Camp 2001, 76; Economakis 1994b, 18; Hopper 1971, 123-125; Korres 1983c, 15-18).

The sculptural adornment illuminated the role of the temple in projecting the image of the city. Phedias was responsible for the four main groups of the Parthenon sculptures with the following themes: the birth of Athena and the contest between Athena and Poseidon for becoming patron deity of Athens (pediments); gods fighting giants, Greeks fighting centaurs, Greeks fighting Amazons, and Greeks fighting Trojans (Doric frieze); the Panathenaic procession, a huge formal parade (Ionic frieze); colossal chryselephantine statue of Athena (cella) (Camp 2001, 77-79; Korres 1983c, 41; Korres 1994e, 29-31).

Since antiquity, the Parthenon has survived many vicissitudes (Camp 2001, 82; Korres 1983c, 7). Damages occurred in 426 BC from an earthquake but were immediately repaired (Korres 1983a, 135). Changes in its later history include the use of western chamber as the residence of Demetrios Poliorketes (304 BC); destruction of the Athena statue to melt down the gold (295 BC); addition of a monument along the south wall by Attalos I of Pergamon (end of 3rd century); heavy damages caused by thermal activity in the interior as the Heruli set it on fire (267 BC). In 267 BC the Heruli set all public buildings on fire. The heavy damage caused by the intense thermal activity is visible on the interior of the Parthenon. In the 2nd century, Emperor Julian repaired the monument with marble blocks removed from other monuments. A steep roof covered the cella while the peristyle remained (Korres 1983a, 136-137; Korres 1989b, 52-53; Korres 1994c, 47-48; Paraschi and Toganidis 2002, 11; Toganidis 1989, 117; Zambas 2002a, 19-22). Under emperor Justinian (6th century AD), it was converted to a Christian basilica. The transformation of the Parthenon contributed to its eventual survival, but it was also an excuse for planned destructions (Korres 1989b, 53; Toganidis 1989, 117). In 1206 it became the metropolitan cathedral of the Duchy of Athens with a tower built in the northwest corner; in 1460 it was transformed into a Turkish mosque; in 1687 the Turks used the Parthenon as gunpowder arsenal. A great concentration of explosives detonated destroying many parts of the monument; in 1800-01 Lord Elgin stripped the Parthenon of many sculptures and sent them to England (Bouras 1983a, 151-152; Brouskari *et al.* 1985, 51-52; Camp 2001, 82; Korres 1983a, 138; Korres 1983c, 7; Korres 1989b, 53-54; Korres 1994c, 49-51 Paraschi and Toganidis 2002, 11-12; Toganidis 1989, 117; Zambas 2002a, 19-22).

D1.3.1.2 History of excavations and interventions

In 1834 Klenze connected the idea of revival of Hellenic culture with conservation and restoration of the Parthenon. Under his direction excavations were conducted around the monument with rich findings. Pittakis, from 1838 until 1860, excavated in and around the monument. With the help of Rangavis, he restored columns from the north and south facades and rebuilt part of the cella walls repositioning many fallen blocks. The remains of the mosque inside the Parthenon were removed (Bouras 1983a, 152-153; Casanaki and Mallouchou 1985, 12-15; Korres 1983c, 7; Korres 1989b, 54; Mallouchou-Tufano 1994b, 69-74; Mallouchou-Tufano 1998, 17-32; Paraschi and Toganidis 2002, 13- 25; Toganidis 1989, 117; Toganidis 1994, 7; Zambas 2002a, 22). Their work was characterised by improvisation and empiricism and lacked theoretical background and documentation. Yet, they managed to give volume and aesthetically elevate the monument (Paraschi and Toganidis 2002, 14).

Other interventions, between 1862 until 1889, by Greek and foreign scholars, involved exploration of the monument; removal of the remains of the Christian apse; stratigraphical records; consolidation of the west door; conservation work on the west frieze; completion of architraves in marble; various excavations in the east part of the monument; surface surveys and clearing operations in the interior and the west of the monument (Bouras 1983a, 153; Casanaki and Mallouchou 1985, 16-17; Galanou and Dogani 1994b, 69; Korres 1989a, 11; Korres 1989b, 54; Mallouchou-Tufano 1994b, 75-78; Mallouchou-Tufano 1998, 56-61; Paraschi and Toganidis 2002, 15).

Balanos intervened in the Parthenon between 1898 and 1902, with replacement of parts of the opisthonaos colonnade, the western façade, and the western frieze; consolidation of the western pediment; dismantling, conservation and repositioning of members of the east and west pediments and the north peristyle. Machinery of the latest technology was employed while the best material of the era was used after speculation and trials. Balanos intervened again on the Parthenon between 1923 and 1933, restoring the northern peristyle colonnade, parts of metopes and cornices, the south colonnade, and members from the entablature. In the eastern façade he completed and reinforced members of cornices and the east pediment, to which he placed cement casts of four pedimental sculptures. Limited work was undertaken in other parts of the cella and the pronaos. The ancient lintel was replaced with reinforced concrete (Bouras 1983a, 154-157; Casanaki and Mallouchou 1985, 18-19; Galanou and Dogani 1994b, 69-70; Mallouchou-Tufano 1994b, 80-81; Mallouchou-Tufano 1998, 93-102 and 184-186; Paraschi and Toganidis 2002, 15; Toganidis 1989, 205-210; Toganidis 1994, 7; Zambas 1994b, 7; Zambas 2002a, 22).

Orlandos extensively researched the monument, producing The Architecture of the Parthenon, the first survey of the monument in Greek. After unsuccessful proposals, the only works carried out in the 1960s were marble completions of the floor to block rain water, of the later openings in the side cella walls, of the western frieze and the architrave members, and porous limestone completions in certain sterobate parts (Bouras 1983a, 158; Casanaki and Mallouchou 1985, 20; Korres 1989a, 18-19; Mallouchou-Tufano 1994b, 83-84; Paraschi and Toganidis 2002, 16-17).

In the post-war era, the Parthenon presented cracking and breaking of marble pieces, due to oxidation and subsequent expansion of the ironwork incorporated by Balanos (Korres 1989a, 20-22; Mallouchou-Tufano 1994b, 84). The Acropolis Ephorate addressed these problems (Bouras 1983a, 159; Korres 1989a, 22-23; Mallouchou-Tufano 1994b, 85; Paraschi and Toganidis 2002, 17; Toganidis 1994, 7). From 1975 the CCAM has undertaken the battle to save the monument (Korres 1989a, 23; Mallouchou-Tufano 1994b, 85; Paraschi and Toganidis 2002, 17).

D1.3.1.3 State of preservation

The ancient fire caused the greatest proportion of harm, destroying all wooden structures and damaging the interior surfaces of the cella. Many parts, cracked by thermal fracturing, collapsed. The repairs after the fire and the conversion of the temple in a church affected its preservation state (Korres 1983d, 344-358). The form of the monument in 1983 was the one acquired after Balanos restoration and the 1981 earthquake (Korres 1983c, 7; Zambas 1994a, 107; Zambas 2002a, 19).

When CCAM undertook the Parthenon restoration, the necessity of interventions was realised (Bouras 1994a, 101). Quantitative preservation was greater than in most ancient temples. Qualitative preservation presented problems due to gravity, environmental temperature, wind, water, microscopic organisations, vegetation, and expansion of metal joints. The mechanical durability of the marble and elasticity and the perfect fit of contact surfaces were affected. Blocks were fractured, stones presented geometric alterations due to temperature, elasticity, plastic effects, movements, increase of volume, and decrease of dimensions due to surface decrease (Korres 1983d, 233-254).

The east side of the temple was preserved in its original form, with deformations by the 1980s earthquake in the northeast and southeast corners to various extents. The west side was relatively preserved in its original form. The north side resulted from extensive restorations in the beginning of the 20th century and the south side was due to small-scale restoration in 1933. Preservation of the interior included the opisthonaos and the west wall in full height, the west flank walls partly rebuilt, the east wall orthostates and the pronaos columns restored. Stones belonging to the interior were found around the temple (Korres 1985, 96-103). Deterioration was obvious in the Doric frieze, the surfaces of capitals, the epistyles and geisa, and the surface of the stereobate and the crepis (Korres 1983d, 319-320).

Adding up material still in place and dispersed members, the amounts preserved were: flank walls 55%, east wall 20%, pronaos columns 70%, south-east anta 95%, pronaos entablature 85%. Much of the marble was lost to a great depth on the inside of the walls and columns of the pronaos and opisthonaos. Parts of the original ceiling were preserved in the west colonnade. The crepis was preserved throughout. The floors of the colonnade, the pronaos and opisthonaos were preserved almost complete. About 15% of the cella floor and 50% of the west chamber were missing (Korres 1985, 103-111).

D1.3.2 Theory behind the anastylosis proposal of the Parthenon

Discussion on the anastylosis aims and principles took place within a broad framework, so as to limit errors or criticism and ensure multilateral consideration of the question (Bouras 1983c, 401; Bouras 1985b, 86).

D1.3.2.1 Reasons and aims of the current anastylosis proposal

The Parthenon is an outstanding and unique monument symbolising the classical spirit; hence, the responsibility for its restoration and preservation is great. The fundamental consideration is the essential and inescapable nature of intervention (Bouras 1983c, 401). The anastylosis aims were focused on eliminating deterioration causes, improving conservation, and enhancing values (Casanaki and Mallouchou 1985, 82).

Removal of causes of continuing deterioration applies to oxidised and expanded iron elements that split and crumble the marble, and to disintegrated and crumbled cements of past restorations. The entire weight of the members was carried on small surfaces, increasing likelihood of damage in earthquakes. Surfaces eroded due to sulphation caused by pollution while excessive wear by visitors worsened the situation (Bouras 1983c, 401-403; Bouras 1985b, 87).

Improved conservation will be evident after completion of works. Conservation mitigates the effects of unavoidable natural ageing and becomes chief concern in monuments that have ceased to function. Problems to be tackled are the rain flow, which causes mechanical wear and damages the strength and appearance of the stone; the process by which stones dissolve by the carbon dioxide of the atmosphere, and re-crystallise in adjacent positions; the earlier fires and explosions that produced cracks and fissures in the superstructure which is in a state of unstable equilibrium; the resistance to a possible earthquakes (Bouras 1983c, 401-403; Bouras 1985b, 87-88).

Finally, enhancement of the values of the monument will improve the Parthenon as:

- historical, archaeological and scientific document, as it is source of a variety of information on classical architecture, sculpture, technology, economy, society and religion;
- work of art, since its ruined condition fails to do justice to its beauty, and mutilation changes the form, giving the monument a character unrelated to its creators' original intent; and
- functioning building, as it lost its function as a religious building and ceased to be a living monument, but continues to be a cultural one. An increasing demand for socialisation of monuments, for their preservation and display for both scholars and visitors, makes the improvement of conditions of visitation, educational potential and legibility necessary (Bouras 1983c, 401-405; Bouras 1985b, 88-89).

D1.3.2.2 Principles and theoretical framework of the anastylosis

Two positive factors in decisions about the anastylosis are the invaluable experience gained from the Erechtheion, and the maturing of opinions, because ever since the 1940s, the manifest problems of the Parthenon are continuously discussed and investigated (Bouras 1983c, 401).

The Venice Charter is the principal guide in the theoretical approach (Bouras 1983b, 407; Bouras 1994b, 89). Relativity in observation of principles is great because the Parthenon is a monument of exceptional importance from every point of view (Bouras 1983b, 407; Bouras 1985b, 90).

The principles of the charter are reflected in the wide range of specialised skills represented amongst restorers and conference participants (article 2); the proposals for improving the values of the Parthenon, as a scientific-historical document and a building of great artistic value (article 3); the care for not changing the decoration of the temple (article 5) or the general environment (article 6); the possibility of removing the few in situ sculptures (article 8), in the light of the atmospheric pollution; the respect for the original form, supported by knowledge resulting from past research and recent investigations, and the respect for authentic features by avoiding any new work on them (article 9); the use of titanium for all connecting elements, because of data derived from experiments in artificial ageing (article 10); the preservation of the Christian staircase in the cella and the Roman phases of the west doorway, together with the re-assembly and display of the dispersed pieces of the Pergamenese colonnade in the interior (article 11); the harmonious integration (article 12) and differentiation, via the carving of inscription on new members, of both ancient marble pieces and modern replacements; the works constituting a typical case of anastylosis (article 15) in the international sense of the word; the publication of extensive documentation, including descriptions, drawings and photographs, and special measurements (article 16) (Bouras 1983b, 407-411; Bouras 1985b, 91-93).

At the same time, further principles, among which the principle of reversibility, complete the charter by making specific reference to the special needs of classical monuments. Preservation of autonomy of architectural members and their static function is connected with classical monuments, characterised by structural autonomy of individual members, and by achieving static equilibrium through their own weight. Changes in the appearance of the monument will be kept to a minimum, as the classical temples have acquired a symbol value for modern society. The current image of the Parthenon has become familiar throughout the entire world, recorded in pamphlets, books, photographs, and films. Moreover, it is important to respect the past restoration of the monument as a historical event. In addition, operations will be restricted to already restored parts while undisturbed parts will be dismantled and reassembled only exceptionally (Bouras 1983b, 407-412; Bouras 1985b, 90-94; Bouras 1994b, 91; CCAM 1994b, 186-187). Theoretically, restoration of the form of the monument before the 1844-1933 interventions is not unreasonable, but it would be impossible in practical terms for the earlier works are irreversible (Bouras 1983d, 413).

D1.3.3 The anastylosis proposal of the Parthenon

The preliminary studies were initially unsystematic, but became more methodical later. The works focused in replacement of metal elements from older interventions with titanium ones and removal of sculptures to protect them from atmospheric pollution. In their full development since 1986, the aims became conservation of the structure and the stone surfaces, correct repositioning of stones wrongly sited, and partial restoration of certain portions through re-incorporation of existing fallen material around the buildings (Bouras 1994a, 101; Casanaki and Mallouchou 1985, 82; Korres 1994d, 111-113).

D1.3.3.1 The general strategy followed

The restoration proposals are divided methodologically so as to correspond with demands concerning removal of deterioration causes, better conservation, and enhancement of values (Bouras 1983d, 413).

Proposals designed to remove causes of deterioration include dismantling restored parts to resolve the problem of oxidisation and expansion of metal components, preceded by documentation and followed by their preservation in a museum. Reinforced concrete is replaced by Pentelic marble. Shifted architectural members are repositioned correctly. Visitor access has been temporarily restricted, to relieve the deterioration of the floors and the crepis (Bouras 1983d, 414-415; Zambas 1989, 155-156).

Improved conservation after completion of works emphasises the importance of choice of durable and compatible material, such as titanium alloys and white Pentelic marble (Bouras 1983d, 416; Zambas 1989, 156-159). The works include restoration and consolidation of stone members and surfaces, further studies on earthquake protection, and organisation of dispersed architectural material not incorporated into the monument, by locating them away from pathways used by visitors and protecting them against weather conditions (Bouras 1983d, 416-417).

Proposals for improving the values of the monument are divided according to identified values. To improve the Parthenon as a historical, archaeological and scientific monument, interference with the ancient material should be kept to a minimum, dispersed material should be incorporated in the monument, while errors of earlier restorations should be corrected. To improve it as a work of art, anastylosis will have the desired effect, while additional restoration work will be undertaken for functional, conservation and structural stability reasons. To improve it as a functioning object, proposals are designed to improve its educational value (Bouras 1983c, 404; Bouras 1983d, 417-418).

Research for restoration has resulted in a significant substructure of knowledge, perhaps unique in its extent, which enables all interested scholars to have direct access to the smallest details of the monument. Documentation of earlier operations, though not satisfactory, is more complete than that for any other Greek monument (Korres and Bouras 1983, 2).

Various studies have been or are still undertaken. Such are involved with examination of structural problems with the objective of evaluating deterioration and planning repair of each member, especially in the pronaos (Zambas 1989, 153-180); exploration of the earthquake resistance of the Parthenon (Zambas 1985, 127-144); exploration of the stones' quantitative preservation (Korres 1983d, 233-234). Other studies focused on the marble and its conservation, including assessment of deterioration, research on past conservation interventions, and technical studies for conservation, restoration and protection of surfaces (Skoulikidis *et al.* 1989, 181-219). Establishment of a cleaning method and conduct of trial applications to remove the black crust, investigation of the effects of such methods, preparation and study of the properties of mortars suitable for use on Pentelic marble were undertaken (Kouzeli and Beloyannis 1994, 37-40). Studies and experiments were conducted for consolidation of surfaces and production of artificial patina (Skoulikidis 2003, 57), and on laser cleaning of the west frieze (Papakonstantinou 2003, 87). Other programs were the assembly and study of stone inscriptions (Korres 1994a, 175-179); the refinements of the columns (Zambas 2002b, 227); the metallurgical analysis of the iron clamps and dowels of the monument (Varoufakis 1992); computer programs developed to determine the correct position of blocks of the walls and the scattered fragments (Harrington 1995, 50); exhaustive research on the ancient procedures of extracting, working and transferring marbles from the quarry to the Acropolis (Kalligas 1995, 28). Further archaeological and architectural studies led to important discoveries. Various fragments were identified, numerous reused stones were uncovered, architectural observations changed the current ideas and beliefs on the plan and the changes the monument have undergone (Korres 1994a, 175-177).

The work-site was organised with regard to the time and space arrangement of the programs (Bouras and Zambas 2001, 35; Korres 1983e, 501-514; Korres 1994d, 119; Touloupa 1985, 9; Paraschi and Toganidis 2002, 17). Various criteria were taken into account, especially the desire not to obscure the building with huge equipment while work is in progress (Korres 1985, 115). Its external location is better protected against north winds, has best exposure to the sun, visitor movement is not obstructed, and the presence of foreign structures is tolerable functionally and aesthetically (Korres 1983e, 513; Korres 1994d, 119; Touloupa 1985, 9). In the interior, a single crane could reach the larger part of the structure, satisfying demands for economy of space and strength, providing possibility of quicker and direct movement, avoiding negative aesthetic consequences resulting from the visible operation of a crane. Various types of cranes and wagonettes, rail lines and lifts are employed, as well as various methods, devices and scaffolds (Korres 1983e, 513-514; Korres 1994d, 119-122). Later, reorganisation of the work-site concerned the existing substructure, equipment, and procedures and rate of productivity (Toganidis 2002, 8). Various devices are used for cutting new marble blocks. A significant tool is a large electric pantograph for sculptural replication of irregular forms in marble. For working marble pieces various traditional tools are used, as well as modern electric tools (Korres 1994d, 123).

With regard to documentation, a system has been created for codifying all stones. To each stone corresponds a file, which contains drawings of its existing condition on paper, together with sketches, photographs, and notes describing the situation before and after intervention. A second series of files catalogues surface conservation. Physical condition, phenomena related to corrosion, cracks, older repairs, new attempts to join fragments, positions and sizes of hidden metal reinforcements, medieval and later graffiti, traces of polychromy, other material necessary for verification of the original position of stones, details of sculptural decoration are included (Korres 1994d, 113).

D1.3.3.2 The anastylosis programme of the monument

For organisational reasons the anastylosis programme was divided into twelve partial programs, of which the greater part are complete. They correspond to logical division of the surviving part of the building (Bouras and Zambas 2001, 35; Casanaki and Mallouchou 1985, 82; Korres 1994d, 123-124; Korres and Bouras 1983, 2; Paraschi and Toganidis 2002, 17).

Rescue work is executed in sequence depending on its priority, following a relatively quick procedure of approval. The other parts of the programs are executed after a process of presenting proposals, critiques and decisions. Basic prerequisite is the scientific publication of studies and proposals prior to undertaking any final decision (Korres 1994d, 124).

The twelve anastylosis programs are the following:

Programme One -- East side. This programme is divided into two proposals concerning the northeast and southeast part of the façade (Casanaki and Mallouchou 1985, 82; Korres 1985, 96-98; Korres 1994d, 123; Korres and Bouras 1983, 423; Zambas 1990, 12).

Works to be undertaken:

- dismantling the blocks of the cornice, the tympanum and the backing blocks, the corner cornice block and the common cornice blocks, the corner architrave and the metopes and triglyphs of the Doric frieze;
- dismantled members to be preserved by joining fragments and reinforcement with the replacement of all iron elements with titanium ones and sometimes their completion with new marble;
- restoration of drums, columns and capitals;
- removal to the museum of the last remaining in situ original statues of the pediment; setting of cement casts of the existing statues in the pediment.

1983 publication of the (first) Study on the Restoration of the Parthenon, volume 1
1983 presentation of the study to the 2nd International Meeting for the Restoration of the Acropolis Monuments
1986 initiation of works, after approval by the Ministry of Culture and the Central Archaeological Council
1988 decision to extend the intervention in all the east side cornice, so as to remove the metopes to the museum and replace them with casts (Zambas 1990, 13).

Programme Two -- North side and colonnade (Casanaki and Mallouchou 1985, 82; Korres 1985, 102; Korres 1994d, 123; Korres and Bouras 1983, 424; Zambas 2002a, 64 and 125-126 and 171).

Works proposed to be undertaken:

- dismantling of the part restored by Balanos (columns and entablature);
- replacement of all iron elements of the colonnade with titanium ones;
- replacement of cement drums of past restoration by new ones made of Pentelic marble;
- replacement of one metope by cement cast and its removal to the museum;
- possible reconstruction of backing blocks of the Doric frieze and some of the metopes;
- restoration of cornice blocks after their proper completion (on undisturbed parts);

- waterproof covering of the entablature.

2002 publication of the Study for the Structural Restoration of the North Side of the Parthenon. It continues the initial study (Study for the Restoration of the Parthenon, volume 1)
1995 conduct of the study
1999 approval by the Central Archaeological Council
2001 initiation of the works

<u>Study for the Structural Restoration of the North Side of the Parthenon 2002</u>
It includes an analytical description of the deterioration suffered in that part of the monument as a result of the mistakes and the unsuitable technology of the Balanos interventions (Zambas 2002a, 19-21 and 50-63 and 120-121 and 167-69). The documentation system is thoroughly described and explained (Zambas 2002a, 36-49 and 168-170).

The proposals are reconstruction of the restored columns and correction of the 1930s restoration. In particular:

- Dismantling of the 8 previously restored columns, removal of concrete additions and oxidised steel clamps, replacement of concrete patches by Pentelic marble inserts, addition of new inserts to be fixed to drums with titanium reinforces, columns, drums and capitals to be restored to places where they stood before the explosion and with their correct orientation (Zambas 2002a, 64 and 171).
- Dismantling of the entablature, removal of oxidised metal elements, putting together fragments with white cement and joints from titanium, replacement of deteriorated completions from reinforced concrete with additions by Pentelic marble. The architectural members will be restored in their original locations. The metopes will go the Museum and will be replaced by accurate cast copies. There is presentation of the timetables as well as for percentages (actually the percentages are: for dismantling 11% and for re-assembly 7.5% in the entablature) (Zambas 2002a, 125-131).

Programme Three -- South side and colonnade (Casanaki and Mallouchou 1985, 82; Korres 1985, 102; Korres 1994d, 123; Korres and Bouras 1983, 425).

Works to be undertaken:

- dismantling of six columns and their entablature restored by Balanos;
- replacement of all iron elements of the colonnade with titanium ones;
- replacement of cement drums of past restoration by new ones made of Pentelic marble;
- addition of one original triglyph which was lying on the ground;
- replacement of one metope by a cement cast and its removal to the museum;
- addition of some cement casts of metopes, now housed in museums;
- addition of 33 cornice blocks;
- water proof covering of the entablature;
- completion of some drums;
- restoration of a column and the entablature above it (Korres 1983b, 425; Korres 1985, 102).

Programme Four -- West side (Casanaki and Mallouchou 1985, 82; Korres 1985, 98-100; Korres 1994d, 123; Korres and Bouras 1983, 426).

Works to be undertaken:

1) On previously restored parts:

- dismantling, preservation and new fitting of some cornice blocks, of the corner blocks of the pediment, of all members of the slanting cornice and gutter, of two acroteria plinths;
- restoration of the central slabs of the tympanum;
- removal, preservation and new fitting of a cornice block;
- replacement of all external iron clamps of the architraves by new titanium ones;
- drawing of fourth architrave, repairs of capitals, new fitting of architrave;
- preservation work on some capitals;
- replacement of external modern iron clamps of capitals.

2) On original parts:

- completion of central slab of tympanum;
- addition of missing slab;
- addition of blocks of the slanting cornice;

- completion of some large ruptures on column drums;
- possible completion of capital of south-west column;
- completion of the south corner block of the pediments;
- addition of cement casts of two statues (Korres 1983b, 426; Korres 1985, 99-100).

Programme Five: East portico or pronaos (Casanaki and Mallouchou 1985, 82; Korres and Bouras 1983, 427; Korres 1985, 106; Korres 1990a, 24-36; Korres 1990b, 37-51; Korres 1994d, 123; Korres *et al.* 1989).

Works to be undertaken:

- dismantling of a column, replacement of all iron elements by titanium ones and re-composition;
- preservation work and completion of the south pilaster;
- anastylosis of all remaining columns (70% of original material);
- anastylosis of all architraves (80% of original material);
- placement of cement casts of all frieze blocks;
- restoration of ceiling blocks;
- restoration of marble beams of the ceiling;
- water-proof covering of the entablature and the beams (Korres 1983b, 427; Korres 1985, 106).

<u>Study for the Pronaos Restoration (Study for the Restoration of the Parthenon, vol. 2a) 1989</u>

It includes:

- Brief study and graphic restoration of the pronaos (Korres 1989b, 13).
- Description of various architectural features, their study, identification and preservation state (Korres 1989b, 14-52; Korres 1990a, 24-36).
- Description of structural damages and proposed conservation (Korres 1989b, 65-67).
- Philosophy of anastylosis (Korres 1989b, 68-69; Korres 1990b, 38-39).
- Information on the quantity and percentages of the original material, the general state of the material, the evaluation of all the above, the fact that only the

external sides survive while the internal ones are destroyed by fire, various building adventures of this part of the monument; also information on possible anastylosis plans (Korres 1989b, 70-80).

- Systematic analysis of the values of the monument (Korres 1989b, 82-85).
- Comments on the access to the monument (Korres 1989b, 85).
- Building and structural technology and its evolution during the works (Korres 1989b, 85-87).
- The collaborators of the works (Korres 1989b, 87).
- The arguments for anastylosis are: the quantity of the original material, the percentages of the original material for various architectural parts (in terms of surfaces), the general state of the material, the evaluation of all the above, the knowledge of the original form and the individual features, the concentration of 300 blocks from the pronaos and the east wall, the knowledge of the building adventures of this part of the monument (Korres 1989b, 56-70; Korres 1990b, 40).
- Presentation of the proposal of the Pronaos anastylosis (Korres 1990b, 37-51).

Programme Six -- East cella wall (Casanaki and Mallouchou 1985, 82; Korres 1985, 106-107; Korres 1994d, 123; Korres and Bouras 1983, 428).

Works to be undertaken:

- completion, new arrangement and addition of new blocks to the orthostates;
- completion, preservation and arrangement of the square blocks of the walls and of the south pilaster;
- completion of the east wall with square blocks lying on the ground and with new ones;
- partial restoration of the south jamb of the doorway;
- water-proof covering of the wall;
- partial restoration of the threshold belonging to the late Roman restoration of the doorway;
- indication of the form of the early Christian bema apse on the pronaos pavement;

- transversal of the cella – reconstruction of some orthostates blocks of the transversal of the cella for purely didactic purposes
- re-erection of two blocks of the first course of the wall of the transversal of the cella for the same purposes (Korres 1983b, 428; Korres 1985, 106-107).

Programme Seven -- North cella wall (Casanaki and Mallouchou 1985, 82; Korres 1985, 107; Korres 1994d, 123; Korres and Bouras 1983, 429; Paraschi and Toganidis 2002; Toganidis and Matala 2002; Papakonstantinou *et al.* 2002; Toganidis 1989, 113-152; Toganidis 1990, 53-58; Toganidis 1994).

Initial suggestions for works to be undertaken:

- dismantling of part restored by Pittakis and replacement of iron elements by titanium ones;
- removal of all improperly placed blocks and pieces of the orthostates;
- replacement of four stones by new ones;
- reintegration into the wall of 164 ancient ashlar blocks, which come from other places and from the reassembling of fragments, to be preceded by systematic fitting, joining together and preserving of the fragments;
- integration of blocks of the bedding course of the ceiling and some marble beams;
- water-proof covering of the wall (Korres 1983b, 429; Korres 1985, 107; Toganidis 1989, 149).

Programme Eight -- South cella wall (Casanaki and Mallouchou 1985, 82;Korres 1994d, 123; Korres and Bouras 1983, 430; Papakonstantinou *et al.* 2002; Paraschi and Toganidis 2002; Toganidis 1989, 113-152; Toganidis 1990, 53-58; Toganidis 1994; Toganidis and Matala 2002; Skoulikidis *et al.* 1994; Korres 1985, 107). Programs Seven and Eight initiated in 1984 and concluded in 2002 (Paraschi and Toganidis 2002, 9 and 17-19 and 119). They took priority from other programs due to technical and organisational matters of restoration (Toganidis 1989, 113; Toganidis 1990, 53).

Initial suggestions for works to be undertaken:

- dismantling of the part of the wall restored in 1844;

- replacement of all iron elements by other made of titanium;
- removal of all improperly placed blocks;
- completion of some orthostates blocks;
- reintegration into the wall of square blocks found dispersed, after maintenance and completion;
- water-proof covering of the wall (Korres 1983b, 430; Korres 1985, 107; Toganidis 1989, 149).

Timetable for programs 7 and 8:

1984 onwards collection and identification of 400 membra disiecta from the walls (Paraschi and Toganidis 2002, 17 and 119)

1989 3rd International Meeting for the Restoration of the Acropolis Monuments: presentation of the preliminary study of the side walls of the monument (volume 2a) (Paraschi and Toganidis 2002, 9).

1989 proposal for removal of the restored sections of the long walls and approval (Skoulikidis 1994a, 7)

1992-1993 dismantling of the restored parts of the walls (initially of the south wall and then of the north wall): initiation of the analytical documentation and study of blocks (Paraschi and Toganidis 2002, 9 and 18 and 119; Toganidis 1994, 7-28).

1994 compilation of study for the side walls of the cella (volume 5) (Paraschi and Toganidis 2002, 9).

afterwards systematic accurate measurements and photographic documentation of all stone blocks, in order to restore them to their correct positions (Paraschi and Toganidis 2002, 18-19 and 119).

1997 approval by CAC (Central Archaeological Council) and initiation of restoration (Paraschi and Toganidis 2002, 9).

2002 completion of restoration (Paraschi and Toganidis 2002, 9).

<u>Preliminary study of the side walls (north and south walls of the cella) of the Parthenon. (Study for the Restoration of the Parthenon, volume 2a)</u>

(Toganidis 1989, 113-152) (Programs 7 and 8).

The preliminary study of programs 7 and 8 includes a description of the:

- initial form of the walls;
- building adventures of the walls;

- suffering from earthquakes and explosions;
- structural problems;
- natural deterioration;
- anastylosis errors of past interventions;
- present state of preservation of standing walls;
- dispersed material further away from the temple;
- percentages of available material;
- evaluation of surviving material anastylosis proposals (Toganidis 1989, 115-145; Toganidis 1990, 53-59);
- anastylosis proposal for both walls (Toganidis 1989, 145-149).
- presentation of percentages of surviving material (Toganidis 1989, 126).

According to the architect conducting the study, the south wall has huge amounts of surviving material. The north wall has major lack of surviving material so it will have a form reduced in its east side (Toganidis 1989, 145). These percentages are:

- for the north wall: 95,7% the toichobate, 90,5% the orthostates, 65,5% the stone blocks, 65% the epistyles, 0% the frieze, 19,1% the thranoi;
- for the south wall: 100% the toichobate, 80,95% the orthostate, 77,30% the stone blocks, 50% the epistyles, 8,5% the frieze, 32,7% the thranoi (Toganidis 1990, 58).

<u>Restoration Project on the Long Walls of the Cella 1994</u>

<u>Study for the Restoration of the Parthenon, volume 5</u>

The purpose is to locate and verify the original position of each stone, using the information preserved and provided by the stones themselves (Toganidis 1994, 5). The approach to studying and examining the building blocks resulted in the development of a computer program, the matching of fragments of architectural members, the collecting of scattered building blocks, the documentation of every architectural member with registration, drawing, photograph, file update on conservation, entry of data in computer, the analysis of the materials of the walls, the study of the setting direction of the blocks and the junction of the middle cross-wall and the long cella wall, observations on various parts of the walls, and study of structural stability issues (Toganidis 1994, 29-69). All blocks whose original position is known will be restored to that position. In areas where the original positions of many ancient blocks are known, missing blocks may be replaced in new marble. As minimum, it is suggested the balance of new to ancient material to be 1:6. Blocks whose original positions are unknown are not included in the rebuilding. The material used for restoration is marble; the big pieces restored in new marble are to be marked with the date on each invisible surface; harmonising the colour of the new marble with the ancient marble is a problem; the restorations on the south side need careful study in order to avoid the aesthetically negative impact of strong shadows, due to exposure to strong sunlight (Toganidis 1994, 73).

<u>Study for the Restoration of the South Wall of the Parthenon 2002 (programme 8)</u>
<u>Study for the Restoration of the Parthenon, volume 6</u>

The second part analytically presents the structure and architecture of the sidewalls and their present condition (Paraschi and Toganidis 2002, 19-48 and 119-120). The topics include:

- the present condition of the in situ section of the south wall;
- the architecture and structure of the side walls;
- the successive stages in preparation of each block and the methods involved in their positioning – the methods used for preparation of surfaces of the walls and structural continuity of the building, the means used for transportation, the position and the joining of blocks and the chronological order of their positioning, cutting and final dressing to achieve a perfect harmony;
- the architectural refinements of the members;
- the evidence about the structure of the walls that was uncovered during this study (Paraschi and Toganidis 2002, 19-48).

The proposed actions for repositioning the blocks of the south wall consist of:

- use of code to follow the coding set for the Parthenon architectural members;
- formulation of criteria to research the original positions of blocks;
- formulation of methodology for rearrangement of blocks with use of computer assistance and traditional methods (evaluating, comparing, combining data);
- presentation of proposal for repositioning blocks with plans and pictures;

- distribution of remaining unidentified blocks and their repositioning, placed in conventional positions rather then being left on the ground (Paraschi and Toganidis 2002, 48-73 and 120-121).

The new proposal for the restoration of the south wall concerns:
Theoretical principles. They follow the Venice Charter and those principles adopted for the restoration of the classical monuments. The restoration is unavoidable for scientific reasons: correction of the errors of the past. The evident benefits are the improvement of the appearance of the wall; the recovery of the authentic structure, the architectural character and the aesthetic refinements; the better preservation of the walls and the scattered fragments; the improvement of the static sufficiency. At the same time, the accentuation of the unique and dominant artistic character of the Parthenon, the legibility of the ruins, the increase of the cultural impact of the whole monument are projected (Paraschi and Toganidis 2002, 90-92 and 100 and 121-125).
Special problems that arise in relation to the theoretical principles. The proposals for the south wall meet all principles for correct intervention, as the original architecture and structure of the wall is obtained; the original positions of the walls are recovered; the amount of new marble blocks required is limited to the necessary percentage for the restoration of original ones. The construction material is the same as in antiquity, Pentelic marble. It is used for completions and additions and achieves harmonious but distinguishable integration (Paraschi and Toganidis 2002, 90-122).
The proposal for restoration was also based on recent identification of additional scattered ancient material which lead to larger restoration of the south wall, amounting to 57% more than the previous one. The proposal predicts repositioning in original places of 254 blocks south-west (85% of this part of the ancient wall) and of 57 blocks south-east (75% of this part of the ancient wall). Various groups of 45 in all contingent blocks have been identified but not their original locations. If the proposal is followed, it will lead to the recovery of the state of walls after the 1687 explosion and just before the Greek War of Independence (Paraschi and Toganidis 2002, 92-94 and 122).
The alternative proposals for restoration of the inner face of the south wall. The inner face does not have a clear original form because of the virtually complete destruction of the surface of the blocks. Due to thermal fracture, most are formless. It

is essential that they are replaced by new marble. Three alternative proposals are formed (Paraschi and Toganidis 2002, 95-100 and 123-125).

Study for the Restoration of the North Wall of the Parthenon (programme 7) 2002

The theoretical principles follow those of the initial study. This programme and study is the continuation and completions of studies 2 and 5. It follows the same principles, methodology and way of work. However, it includes further information on the north wall, the structural synthesis of the long wall, the criteria for identification of the stones, the connection of the north and the transversal walls; and new data for the initial structure (Toganidis and Matala 2002, 3-14).

Programme Nine -- West portico or opisthonaos (Casanaki and Mallouchou 1985, 82; Korres 1985, 107-108; Korres 1989a; 206; Korres 1994d, 123; Korres and Bouras 1983, 431). After removal of ceiling beams (10th and 11th programs), restoration work took place on previously restored and undisturbed parts (Korres and Bouras 1983, 431; Korres 1985, 107-108). Later, it was proposed to reconstruct the ceiling of the west pteron, by using marble architectural members prepared during the 1950s, in the view that it would assist earthquake resistance and contribute to the educational values of the building (Korres 1989a, 89 and 114; Zambas 1994b, 26-35 and 193-196). Special emphasis was placed on the West Frieze, which was dismantled, transferred to the stores of the museum, and is conserved (Korres 1989a, 24-35 and 109-112). At the same time, it was possible to carry out the work on the west part of the monument, according to schedule. The working procedure of the opisthonaos dismantling was similar to that employed for the Erechtheion and for the east end of the Parthenon (Korres 1989a, 27-28 and 109-110). The objective was structural restoration of the west prostasis, as well as conservation and aesthetic elevation. Hence, the works included more consolidation and conservation and less anastylosis (Koufopoulos 1995a, 55)

Works initially suggested to be undertaken
(after removal of ceiling beams --10th and 11th programs--):

- dismantling, preservation, replacement of iron elements and new fitting of blocks of the ceiling, restored backing blocks of the frieze, some blocks of the frieze, new architrave blocks, repairs on capitals and their drums (all these are parts restored by Balanos in 1900).

- replacement of two modern blocks of the western frieze by cement casts of originals;
- addition of cement casts of some original blocks of the north frieze;
- replacement of some frieze and architrave blocks of the with the original ones;
- completion of the sixth capital;
- filling of a part of the west front of the architrave with new marble;
- possible removal of all in situ blocks of the western frieze to the museum and replacement of the originals with cement casts (Korres 1983b, 431; Korres 1985, 107-108).

<u>Restoration of the opisthonaos and the ceiling of the west wing (programs 9 and 11)</u>
<u>Study for the Restoration of the Parthenon, volume 2b, 1989</u>

Examination of the long history of interventions in the opisthonaos and the west frieze throughout the 19th and the 20th century (Korres 1989a, 11-23). Beyond the immediate salvage operation of moving the frieze to the museum where it will be given conservation treatment and put on show, the intervention aims at structural restoration of the west portico, improving its resistance to agents of decay and improving its appearance. This will also enable the building to maintain its resistance against the agents of continuous destruction. The restoration of the coffered ceiling would contribute to the educational value of the building, given that the west aisle would be the one place where the building is preserved complete as far as the ceiling level. Both the principles governing the proposed interventions and the methods of putting them into practice are identical with those applied in interventions in other parts of the building (Korres 1989a, 89 and 114).

Special emphasis is placed on the West Frieze of the Parthenon. It is one of the best-preserved sculptural entities in the monument. From its initial length about 2/3 survive -- partial survival in north and south sides, great length in west and east. The possibility of safeguarding the surviving frieze in place on the building either by means of a roof or by sealing it in glass case with a controlled atmosphere have been rejected (Korres 1989a, 24-27 and 109). The only solution could be the dismantling, conservation, and transfer to the museum while casts would take its place.

Requirements to be fulfilled for the removal of the frieze:

- full documentation of the present state before and during the intervention;
- application of the requisite technology and the appropriate methods;
- use of compatible materials;
- securing the collaboration of an interdisciplinary team (Korres 1989a, 27 and 109-110).

The above requirements have been met but at the same time it was possible to carry out the work on the west portico (9th program), the west aisle (11th program) and also the west wall (10th program). Thus, not only was the immediate goal of saving the frieze achieved, but also the restoration of the west end of the building according to the schedule planned for the project (Korres 1989a, 27 and 109-110).

Timetable of the works:
1991 to 1993 dismantling of the frieze blocks (Korres 1989a, 40 and 111-112).
1992 conservation study of the frieze (Galanou and Dogani 1994a, 67).
1993 to 1994 conservation of the dismantled members (Korres 1989a, 40 and 111-112).
1998 to 2002 research on cleansing methods used in the frieze.
2000 its treatment commenced
when cleaning is completed they will be placed in the New Acropolis Museum and copies will take their place on the monument (Papakonstantinou *et al.* 2002, 9).

Opisthonaos

The opisthonaos is quantitatively in a much better condition in comparison with the rest of the Parthenon. However, together with the west façade, presents the most serious problems with regard to conservation, because the marble was subjected to catastrophic fire and to direct hits from cannon reducing the stone to fragments, together with the usual problems of the past interventions. Moreover, it has the best-preserved ancient adornment and a number of important historic features. There is considerable knowledge of the original form of the opisthonaos because of its quantitative state of preservation and from earlier studies though certain features require further research. Quite a few items of information have emerged during the work of dismantling and from identifying membra disiecta on the ground (Korres 1989a, 83 and 113-114).

Dismantling the architectural members from the opisthonaos did not present any special difficulty since no new technical skills or lifting devices were required (Korres 1989a, 28 and 110).

The complete documentation (drawings, photographs and filming) of the preservation state of the west aisle and the opisthonaos was prerequisite for initiation of any intervention (Korres 1989a, 37).

Timetable of the works:
1992 systematic recording of deformation and condition of the opisthonaos (Korres 1989a, 37-39 and 111).

<u>Study for the Restoration of the Opisthodomos. Structural Problems 1994</u>
<u>Study for the Restoration of the Parthenon, volume 3b, programs 9 and 11</u>
Research on the structural restoration of the opisthonaos comprises recording, diagnosis, and assessment of structural damage to this part of the building and proposals for restoring these members. However, there is no question of recording and repairing all the damage, since that would be tantamount to altering the entire character of the monument and it would entail their complete dismantling. In drawing up the study, special emphasis has been placed on drawing as much information as possible from the building itself, and on the use of modern computing and experimental techniques for checking or interpreting this information. The study was a collaborative effort by the CCAM, the SCAM, the Research Centre for Public Works, the Laboratory of reinforced Concrete at the NTUA, and the Airforce Centre for Research and Technology (Zambas 1994b, 5-6 and 185-186).

The main structural damage suffered by the opisthonaos is described as the collapse of parts of it, the fracturing of the marble and the deformation of the building or parts of it and the fracture of joints. The reasons of the structural damage include the big fire of the 3rd century, the explosion of the building in 1687 and the earthquakes that have struck the area of Athens (Zambas 1994b, 8-10 and 21-25 and 187-192).

The proposals for the structural restoration include:

- extension of dismantling to include the epistyle and the column capitals,
- structural conservation of the columns, the stylobate and the entablature,
- and re-assembly;
- proposal to reconstruct the ceiling of the west pteron, by using the marble architectural members prepared during the decade of the 1950s (Zambas 1994b, 28-35 and 194-196).

The second part of the study presents design methods, the experimental data having to do with the reaction of the building to mechanical stress, and the planning for structural restoration. This part is general in scope since it contributes to the relatively limited bibliography on structural repairs to ancient monuments (Zambas 1994b, 69-185).

The objective is the structural restoration of the west prostasis and its conservation and aesthetic elevation. Hence, the works included more consolidation and conservation and less anastylosis (Koufopoulos 1995a, 55)

<u>Study for the Restoration of the Parthenon. Conservation of the West Frieze 1994</u>
<u>Study for the Restoration of the Parthenon, volume 3c</u>
This study comprises of:

- a brief historical overview
- a detailed condition report of the sculptural whole,
- a survey of previous restoration treatments and
- a comprehensive conservation proposal (Galanou and Dogani 1994a, 67).

Section I focuses on the present condition as a whole, describes the deterioration factors in order of importance, and sets forth the conservation methodology. Section II contains a detailed description of each block and is accompanied by a step-by-step conservation programme (Galanou and Dogani 1994a, 67).

The report includes condition mappings, photographs, in situ observations, and a collection of samples from pointing mortars. The deterioration of the west frieze can be attributed to a combination of mechanical, physical and chemical factors. The long and tumultuous history of the Parthenon had repercussions on the west frieze as well. In addition to the structural deterioration, the action of water in all its forms contributed to the physico-chemical deterioration of the marble matrix. Black crust has formed in protected areas of the relieves; weathering with sugaring, erosion, blistering and deterioration by soluble salts, is evident; monochromatic surface layers are obvious as either remnants of previous preservative treatments, the result of biological growth or a combination of both; previous interventions have also contributed. The conservation proposal follows the principles used in the restoration of the Acropolis monuments. The materials and methodology are in accordance with the principle of minimum intervention (Galanou and Dogani 1994b, 74-86 and 91).

The proposed interventions are:

- reattachment of the large fragments which comprise the blocks;
- reattachment of small fragments and flakes;
- grouting of interior voids and cracks;
- cleaning of black crust and soot deposits;
- pointing of cracks and aluminosilicate veins which have been previously pointed;
- consolidation of the surface;
- optional construction of removable marble infills on the blocks corners (Galanou and Dogani 1994b, 91-99).

<u>Study for the Cleaning of the West Frieze of the Parthenon 2002</u>

<u>Study for the Restoration of the Parthenon, volume 7</u>

This is a research project about the cleansing methods used in the Parthenon West Frieze between 1998 and 2002. The purpose was to provide a comparative study of the cleaning methods that will be applied wither separately or in combination, so as to safely clean the sculpted surface, achieve the best aesthetic result, preserve the gypsum layer, which preserved details of the relief, and preserve the monochromatic surface layers (Papakonstantinou *et al.* 2002, 9 and 145).

Its treatment included these stages:

- consolidation of surface;
- removal of bronze dowels and plasters from earlier treatments;
- reattachment of the fragments;
- cleaning of surfaces; and
- sealing of cracks and gaps (Papakonstantinou *et al.* 2002, 9 and 145).

Programme Ten -- West wall (Casanaki and Mallouchou 1985, 82; Korres 1985, 108-109; Korres 1994b, 107-110 and 125-26; Korres 1994d, 123; Korres and Bouras 1983, 432).

Works to be undertaken

- temporary removal of two blocks of the west wall frieze and of fifteen blocks of the west wall;
- preservation of one marble beam of the lintel;
- re-assembly of the lintel;
- reconstruction of the inner marble beam of the lintel;
- replacement of all iron elements of the south beam by titanium ones;
- preservation work, replacement of iron cramps and completion of orthostates, ashlar blocks and blocks of the bedding layer of the ceiling;
- reconstruction work on the mediaeval staircase;
- completion of external masonry;
- water-proof covering;
- removal of stones not belonging to the monument;
- treatment of in situ parts and dispersed material from jambs of the Roman restoration of the doorway;
- completion of broken ends of the classical jambs (Korres 1983b, 432; Korres 1985, 108-109).

<u>Study for the Restoration of the West Wall of the Parthenon and Other Monuments 1994. Study for the Restoration of the Parthenon, Volume 4</u>

This study includes a description of the:

- architecture of west wall;

- structure of west wall and stone members in second use;
- present state of west wall and damages and alterations of forms;
- building adventures of west wall;
- detailed architectural and structural description of door;
- building adventures of the door (Korres 1994b, 13-106 and 121-125).

The restoration proposal comprises:

- piecing out the sections of the orthostates that are damaged;
- filling in the gaps in the interior face of the wall;
- filling in destroyed exterior surfaces or parts of some of the stones on the outer face of the wall; restoration of the area of the little door at the south;
- conservation treatment of the later threshold of the ancient door on the north side of the opening and partial reconstruction of the ancient threshold on the south side;
- restoration of the ancient lintel using all of the ancient blocks and new marble to fill up the gaps; restoration of stone members;
- various small interventions on the inside of the spiral staircase in order to uncover concealed features of the monument (Korres 1994b, 107-110 and 125-126).

Programme Eleven -- West wing roof. It is conducted together with Programme Nine (Casanaki and Mallouchou 1985, 82; Korres 1985, 110-111; Korres 1989a, 89 and 114;Korres 1994d, 123; Korres and Bouras 1983, 433; Zambas 1994b, 28-35 and 194-196).

Works to be undertaken:

- replacement of a new marble beam by an original one lying on the ground;
- completion of the first beam with original fragments recently found;
- replacement of all iron clamps existing on the slabs between the beams;
- completion and new fitting of slabs, after assembling of original and new fragments;
- possible reinforcement of existing original and new beams with titanium elements;

- final curving and correcting of the new coffer-slabs prepared for the restoration of the ceiling by Orlandos and placement of these slabs;
- water-proof covering of the ceiling and of the entablature; and
- arrangement of a drainage system (Korres 1983b, 432; Korres 1985, 110-111).

Programme Twelve -- Crepis and floors (Casanaki and Mallouchou 1985, 82; Korres 1985, 112-113; Korres 1994d, 123; Korres and Bouras 1983, 434).

Works to be undertaken:

- cleansing of the pavement;
- preservation work and completion of crepis blocks and peristasis pavement slabs;
- re-arrangement of some stones of the cella crepis;
- preservation work and completion of the pavement slabs inside the cella;
- covering gaps with transparent material, to show elements for didactic purposes;
- protective covering of pavement parts (Korres 1983b, 434; Korres 1985, 113).

D1.3.3.3 Parthenon restoration timetable

The intervention began from the east side because of the damage caused to the two east corners of the building by the great earthquake of 1981. With the progress of dismantling the upper part of the entablature, previously unchecked damage was brought to light. Consequently, the programme that was under way was submitted to successive revisions, resulting in doubling its original extent and calculated duration (Korres 1994d, 125; Koufopoulos 1995b, 13). During re-assembly of the entablature and the pediment, cast concrete copies prepared in the workshops of the Centre for the Acropolis Studies were used in place of the authentic metopes and the copies made in 1931. The structural intervention on the east side of the building was completed in 1991 and the large scaffolds were removed. On the south side, restoration of the fifth column and its superstructure was carried out in 1991-92 (Korres 1994d, 125 and 129). In 2001, the programs of east side and part of the south side were completed (Bouras and Zambas 2001, 35).

The salvage work concerning the lowering and transport of the existing stones of the Panathenaic Frieze to the museum began with various preparatory activities in 1992 and was completed in the beginning of 1993. The temporary removal of the architraves allows structural conservation of the columns. The repositioning of all the stones will take place as in the eastern side of the building. Cast copies shall be positioned in the frieze (Korres 1994d, 129-131; Harrington 1995, 51), after their production, which was planned to be ready by 2003 (SRAM 2001).

Salvage work has also progressed along the length of the cella sidewalls. It will be completed with dismantling of restored portions of the north and south peristyle colonnade (programs two and three) and removal of all metal ties and reinforcements from the western façade (programme four). The succeeding interventions, initiating in 1997, consisted of repositioning of temporarily removed ancient stones and other ancient members, which had remained on the ground (Korres 1994d, 131). The programme was altered after 1998 and in 2002 altered proposals were presented (Toganidis 2003, 123).

Work on the restoration of the pronaos, after approval of the second proposal, lasted from 1995 to the beginning of 2002 (Bouras and Zambas 2001, 35 and 188; Toganidis 2003, 117). The structural restoration of the dismantled members of the opisthonaos began in 1995. By 1999, the in situ consolidation of the columns had been completed (SRAM 2001). Until 2000 dismantling, structural conservation and re-assembly of the epistyles took place (Bouras and Zambas 2001, 40). In 2001, works continued on the systematic restoration of the frieze and the architrave (Bouras 2002, 13-15; Koufopoulos 2003, 131). It was hoped that it would have been finished by 2003 (Toganidis 2003, 122). Work on the opisthonaos started in 1994 but has not finished yet. Works on the crepis, floors, and the west wing roof are still in progress.

The works on the north side and the eight previously restored columns initiated in 2001 (Bouras and Zambas 2001, 40; Zambas 2003, 179). It was hoped to have dismantled and restored the entablature and the columns of the north side by 2004 (SRAM 2001; Toganidis 2003, 119).

APPENDIX D2: THE AVATON OR ENKOIMETERION AND THE PROPYLON OF THE GYMNASIUM IN THE SANCTUARY OF ASKLEPIOS AT EPIDAUROS

D2.1 Introduction

D2.1.1 History of the site

The Sanctuary of Asklepios at Epidauros was the most celebrated healing centre of the ancient world (HMC 1995-2001a). It is a rare occasion of sanctuary that acquired reputation independently of the city it belonged. It was considered the starting point of medicine, practised as a power and given to people from the god (Lambrinoudakis 1999a, 10).

The beginning of worship is dated in the 16th century BC. After the fall of the Mycenaean world, the worship was relived in 800 BC. From the 6th century onwards, the fame of the sanctuary became greater (Lambrinoudakis 1999a, 11-14), and the hilltop sanctuary of Apollo Maleatas[1] was no longer spacious enough for public worship. The authority and radiance of Asklepios[2] as the healer god of antiquity brought great financial prosperity to the sanctuary. This enabled implementation of an ambitious programme for construction of monumental and secular buildings, around the 4th and 3rd century BC (HMC 1995-2001a).

In the 1st century BC the sanctuary suffered great destruction with the Roman conquest. In the 2nd century AD it flourished again, thanks to the generosity of the Roman senator Antoninus, and continued until 426 AD when Emperor Theodosius II prohibited pagan worship (Iakovidis 1979, 127; Lambrinoudakis 1999a, 17-18).

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[1] It is situated two kilometres southeast of the sanctuary of Asklepios on a low hilltop of Mountain Kynortion (Iakovidis 1979, 144). Very early remains of the cult (altar of Mycenaean sanctuary; altar and temple of early historical times), classical buildings (temple, altar, temenos of Muses, stoa) and buildings of the Roman era are found there (CCEM 1994, 6).

[2] We have no way of knowing how the worship of Asklepios was transplanted to Epidauros but it is interesting to note that in order for it to take root it was necessary to identify Asklepios with a local form of Apollo, himself merged already into a still earlier deity, Maleatas. Thus, Asklepios continued until much later to be mentioned together with Apollo Maleatas (Iakovidis 1979, 127).

D2.1.2 Description of the site

The archaeological site of Epidauros is situated in the northeast Peloponnese, the south county of mainland Greece. The sanctuary of Asklepios comprises the following monuments:

- Temple of Asklepios, a progressive example of Doric architecture;
- Thymeli or Tholos of Polycleitos, cyclical mystic place;
- Avaton, big stoa which included a sacred well;
- Loutro, building that symbolised the importance of water in the cure of patients;
- Library, building that prepared patients, through reading, to receive cure;
- Temples of Artemis, Aphrodite and Themis, serving the worship;
- Gymnasium or Estiatorion, big ceremonial restaurant;
- Katagogion, hotel for patients and their escorts;
- Theatre, where theatrical and musical events were held (CCEM 1999).

D2.1.3 Significance of the site

Given the long history of the sanctuary through prehistory and historical times, the historical significance of the Epidauros ruins is realised, together with the emotional value of its architecture by the evidence of time of life and by direct knowledge of the oldest organised curative centre where the transfer from divine healing to the human medical science is recorded (Lambrinoudakis 1999a, 11). Since 1988, the sanctuary of Asklepios has been included in the World Heritage List (HMC 1995-2001a; Lambrinoudakis 1999a, 21).

D2.1.4 History of excavations, interventions and studies

The French Scientific Mission to the Peloponnese was the first to conduct excavations on the site (HMC 1995-2001a). However, the ruins of the twin sanctuaries were brought to light by systematic excavations carried out by the Greek Archaeological Association under P. Kavvadias in 1879-1928, and more thoroughly in 1881-1889 (Iakovidis 1979, 130; Lambrinoudakis 1999a, 18). In 1902-1909, Kavvadias built a museum in order to house the partial reconstructions of the most important monuments of Asklepieio and the excavation finds (HMC 1995-2001b). The first restoration works started on the Theatre in 1907 (Lambrinoudakis 1999a, 18). Kavvadias had comprehensively published his two major works Fouilles d'Epidaure (1891) and The Sanctuary of Asklepios at Epidauros (1900). His later work was reported more briefly in the Transactions of the Archaeological Association (Tomlinson 1983, 7).

Martin and Metzger conducted further investigations in 1942-43 on the Avaton and building E. Excavations resumed from 1948 to 1951 (HMC 1995-2001a). Papademetriou did additional research on the sanctuary of Apollo Maleatas in 1948-1951 (Iakovidis 1979, 130). In 1954-1963 Orlandos continued the anastylosis of the Theatre, in which, since 1954, cultural activities of the Epidauros festival are organised with drama and music performances (Lambrinoudakis 1999a, 18).

In 1958, a storeroom was built at the northwest end of the site and storerooms of sculpture and pottery northeast of the museum. In 1971, a new hall was built northwest of the museum to house the inscriptions collection (HMC 1995-2001b). Excavations on both sanctuaries resumed in 1974 (HMC 1995-2001b; Iakovidis 1979, 130). Until 1988 there had never been a full definitive study[3] and the accounts and interpretations of Kavvadias formed the basis of modern popular description (Tomlinson 1983, 7).

D2.1.5 Recent history and current situation

In 1984 a Committee for Conservation of the Epidauros Monuments (CCEM) was established by the Ministry of Culture (CCEM 1994, 1). It is an interdisciplinary committee responsible for scientific decisions for conservation and protection of monuments and for attendance and co-ordination of works (Lambrinoudakis 1999a, 16). It consists of archaeologists, architects, geologists, topographers, and civil and chemical engineers.

Priority of the Committee was to safeguard the sanctuary against continuing deterioration, either through ethically permitted partial restoration of monuments, thus assisting in their self-protection, or by extensive conservation treatment of the authentic material in those monuments where the preservation state suggests limited

[3] There is a publication by A.Defrasse and H.Lechat entitled *Epidaure, Restauration et Description des Principaux Monuments du Sanctuarie d'Asclepius* (1895). Through their graphical restorations are considered masterpieces they contain too many errors and assumptions that have now been proved erroneous to be of any value (Tomlinson 1983, 7).

restoration (CCEM 1994, 1; Lambrinoudakis 1999a, 19). The works undertaken by the Committee aim at improving the presentation of the sanctuary as a whole while organising an instructive and controlled route for visitors (HMC 1995-2001a; CCEM 1994, 1).

Works started with laying out a pathway to direct the flow of visitors in the site (CCEM 1994, 1). Then, priority was given to configuration of the ruins of three central characteristic monuments (Avaton, Propylon of the Gymnasium and Tholos) to which the West Parodos (Byway) of the Theatre was added (HMC 1995-2001a; Lambrinoudakis 1999a, 20). It is hoped that with restoration works the ruinous sanctuary will regain its monumental character and that its latent educational potential will assume a wider social role in modern society (CCEM 1994, 2).

D2.1.6 Introduction to the anastylosis and restoration works undertaken

The Committee for Conservation of Epidauros Monuments, facing the task of restoration of selected monuments, initially conducted limited excavations in the monuments surroundings to facilitate and supplement archaeological and architectural studies. At the same time, anastylosis proposals were drawn up. The studies[4] were presented in international conferences held in Greece with wide participation of Greek and foreign professionals. In these conferences various issues were discussed and diverse opinions were heard regarding both theoretical and technical issues. Supplementary reports were formed for each monument and, together with the initial proposals, were submitted to the Central Archaeological Council, which in turn approved them. Following that, anastylosis initiated.

These works are now in various stages of implementation. Four teams were formed, manned with skilled workers and technicians and having full technical support. Specialised scientists supervise the works. In order to obtain the necessary stone for restorations, identical or similar to the ancient, a survey was undertaken in order to locate suitable quarries. Materials and techniques for conservation of the authentic material are constantly investigated and experimented upon (CCEM 1994, 1-2). Such

[4] These studies generally include an introduction about the site and the framework of the restoration works, presentation of the archaeology and architecture of the specific monument and the anastylosis proposal.

experiments and research are conducted in collaboration with the Stone Centre of the Greek Ministry of Culture and with the Institute of Geology and Mineral Exploration (IGME) at Athens (see Varti-Matarangas and Matarangas 2000). The architect responsible for the Avaton anastylosis conducted an individual study on the structural members of the monuments, researching the kinds of stones used, their composition, and their deterioration reasons, and suggesting ways for their protection (see Maurommatidis 1988).

Aim of the conservation and anastylosis interventions is the preservation of monuments as works of art and historical testimonies, by revealing their aesthetic and historical values. Educational values are enhanced through their 'didactic exposure' to the public (CCEM 1987b, 5). All restoration programs are carried out according to the internationally accepted principles of the Venice Charter (CCEM 1994, 2). Three more principles, deriving from experience of anastylosis of classical Greek monuments, are followed: reversibility of interventions, structural adherence of architectural members and use of anastylosis as means of self-protection (CCEM 1987b, 7; CCEM 1994, 3).

The reasons for choosing the specific monuments are described by the restorers. They underline that general objective is to include further monuments of the site for future study and restoration. This entails drastic changes in the immediate surroundings, resulting in elevation of the setting with clearing of dispersed architectural members and restitution of the third dimension (CCEM 1987b, 5).

For original architectural members included in the partial reconstructions of the museum, decision on whether they will be used in the museum or in the anastylosis is made after careful consideration of particular conditions and factors. Respect for historical phases of the monuments is shown by preserving valuable ones, whilst less significant ones are removed after speculation (CCEM 1987b, 6; CCEM 1994, 2-3).

Adherence, wherever possible, to ancient building methods is achieved with restriction of interventions and use of new material to what is deemed absolutely necessary, especially when it comes to structural support (CCEM 1994, 2-3). Traditional methods and techniques are utilised in combination with modern ones.

Natural stone is used for completion of missing parts, after examination of its mechanical, physical and chemical characteristics. Differentiation between new and old parts is an important objective and inscriptions are sculpted on new members. Authentic elements and new additions are placed to original or corresponding locations (CCEM 1987b, 6).

D2.2 The Avaton or Enkoimeterion

D2.2.1 Introduction

D2.2.1.1 Description and history of the Avaton

It is a porticoed building (stoa), situated north of the Temple of Asklepios and extended along an east-west axis (Maurommatidis 1987c, 8; Tomlinson 1983, 67).

In its first building phase, around 380 BC, it consisted of its eastern part only (Maurommatidis 1987c, 8), divided lengthways by a wall in two aisles. An open prostyle Ionic colonnade formed the southern aisle. The northern aisle was a closed and dark space, constituting the main Avaton (CCEM 1994, 9).

At the end of the 4th century the Avaton expanded (Maurommatidis 1999, 28) as a two-storied building. At the front, pillars in antis, connected by a continuous wall, formed the ground floor. Six freestanding Doric pillars in the middle supported the first storey floor through wooden beams. The space had rows of stone benches. At its front, Ionic columns with stone parapets in-between formed the upper storey. This colonnade combined with that of the one-storied stoa produced a single colonnade of thirty-one columns at the front. In the middle, six Ionic columns, directly above the ground floor pillars, supported the roof of the building. An external monumental stairway, served to connect the different levels (CCEM 1994, 9).

D2.2.1.2 History of excavations and interventions

The Avaton was revealed during the excavations undertaken by the Archaeological Association in 1881. The excavator interpreted the architectural peculiarities of the building and proposed restorations of its form. Excavations were repeated between 1940-1945 by the French Archaeological School of Athens. During that time, the excavators proceeded in completions of missing parts and small modifications of the basic architectural image of the monument (Kritzas 1987, 11; Maurommatidis 1987c, 9).

D2.2.1.3 State of preservation

At the time of the establishment of CCEM (1984), the state of preservation of the Avaton was desperate, due to the lack of effective measures ever since its excavation. Harsh weather conditions, vegetation, wearing by visitors, and looting aggravated the situation (Maurommatidis 1987c, 9). The material was suffering from intense deterioration. The stereobate of the ground stoa colonnade survived in full height until the level of the euthynteria; the euthynteria survived only in the east end of the building; the railing-like parapets in the colonnade gaps were preserved fragmentary but satisfactorily; the pillar colonnade of the ground floor was preserved in a good state (Maurommatidis 1987b, 26-32). Due to its state, the Avaton became the first monument where anastylosis would take place.

D2.2.2 Theory behind the anastylosis proposal for the Avaton

D2.2.2.1 Reasons and aims of the current anastylosis proposal

Conservation and anastylosis were decided because of the quantity of surviving dispersed material and the destruction of the monument from natural phenomena and constant wear caused by visitors. The objectives are the protection of surviving parts of the building and education. Dispersed members are identified by visitors with great difficulty, plus, they obscure the image of the monument. Attribution of the third dimension in the ruin, by restoration and re-assembly of its architectural members, will indicate its form and function. The choice for anastylosis of this monument, together with the Tholos and the Propylon of the Gymnasium, aims at elevating the main sacred space of the temple (Maurommatidis 1987a, 21).

D2.2.2.2 Principles and theoretical framework of the works

The proposal is based on the theoretical framework established by the Venice Charter. The basic principles of anastylosis are analysed according to which articles of the charter apply. Moreover, further principles, stemming from the experience of anastylosis works in Greece, are followed (Maurommatidis 1987a, 21-25).

The CCEM consists of professionals from various disciplines (Article 2) who are systematically involved in anastylosis projects. The Avaton presents interesting architectural elements and particularities, which will be preserved and projected with anastylosis. Its function, as testified in ancient sources, renders it an excellent testimony of the ancient medical practice and its significance as a historic document is underlined (Article 3). The extent, size and sort of deterioration impose direct conservation intervention for curbing destruction (Article 4). The monument will be annotated and clearly benefit the public (Article 5). There was always around the monument a disorientating image, because of dispersed elements. Anastylosis will discreetly underline the form of the monument and its role as the north boundary of the sanctuary, without inflicting on any of the neighbouring monuments (Article 6). Any completions or re-integrations with new material will be differentiated and slightly projected in relation to ancient parts. Respect towards authentic elements is safeguarded by avoiding any new intervention on them (Article 9). Internal reinforcement with titanium is employed for joining original stone fragments (Article 10). Intervention does not touch upon the west building that unites with the west end of the post-Roman wall of the monument and the northeast part of the Baths of the Asklepios (Article 11). New elements are harmonically incorporated but differentiated from original parts with different colour tone or technical roughness. Wherever necessary, information regarding the contemporary intervention is carved in non-visible surfaces (Article 12). Additions will respect all monument parts as well as the balance of its synthesis and its relation to the setting (Article 13). Partial anastylosis will reassemble dispersed architectural members to their original or corresponding places. Completions in the less possible extent, aim at providing the basic unity of the image of the monument and at regenerating the morphological unification of the two phases of its history (Article 15). Before any restoration, exhaustive documentation has preceded and will be included on the final publication (Article 16) (Maurommatidis 1987a, 21-25).

Conservation is ensured whilst morphological continuation is restored without any hypothetical restoration. The anastylosis proposal does not proceed in reconstruction work. The distinction between necessary documented completions and reconstruction is determined by various factors, such as the analogy of completion and anastylosis towards the total extent and volume of the building, as well as the form of the archaeological site (Maurommatidis 1987a, 24).

The further principles followed are: reversibility, by ensuring the ability to return the monument and its members to the state before intervention; autonomy of architectural members and self-protection of the monument, by following the structural system of classical buildings with the structural and morphological autonomy of elements; and static sufficiency of structural members due to their weight (Maurommatidis 1987a, 24).

D2.2.3 The anastylosis proposal of the Avaton

D2.2.3.1 The general strategy followed

Initial excavation sections and clearings aimed at diagnosing the consolidation state of the building, chronologically determining architectural elements, accurately exploring dimensions, and enriching relevant historical information. The proposal was based on extensive documentation work, consisting of impressions of architectural elements, anastylosis plans and graphic restorations (ground plan, view, section) (Maurommatidis 1987b, 26; Maurommatidis 1987c, 9).

The main building materials of the stoa were soft and hard porous stone used interchangeably. The focus of protection measures is placed on the badly preserved soft porous stone, since hard porous stone presents fewer problems. Protection of soft porous stone includes reversible interventions on architectural members with the use of new porous stone for reintegrations and additions (Maurommatidis 1987b, 26). Researches on stones with similar characteristics took place in nearby areas. Main criteria for choosing the most proper natural stone were similarity in colour and texture, as well as combination of similar geological composition, physical features, and mechanical resistance (CCEM 1988b, 2-3). Casts for imprinting disfigurements of the original stone surface and traditional tools for transferring these distortions in new stones are utilised to achieve the desirable accuracy. Integrated parts are joined with cement mortar and titanium rods. Differentiation between new and old materials is achieved with rougher sculpting of the surfaces of the additions (Maurommatidis 1987b, 27). Additionally, given the high levels of humidity observed in the area, thin plates of lead are placed between blocks to prevent dampness from affecting architectural members (CCEM 1988b, 3).

There is an effort to preserve the autonomy of each original member. Anastylosis totally respects their initial form and function. Surviving conserved members are reassembled in their original or corresponding position (Katimertzi 2000, 1). The ancient technique of creating small fixings for joining architectural blocks is employed with the innovative use of titanium (Maurommatidis 1987b, 27). Interventions are implemented in the same way in which the works in antiquity were done (sculpting stones, way of transport and setting up, in situ elaboration). Stonework tools are similar to ancient ones (Maurommatidis 1987d, 34; Maurommatidis 1999, 32).

D2.2.3.2 The anastylosis programme of the monument

The anastylosis programme follows the approved proposal of the architect responsible for the works (CCEM 1988b, 4-7; Maurommatidis 1987b, 27-31). It includes:

- Conservation and anastylosis of walls. It aims at extending the height of the walls and at indicating the size and shape of the sleeping ward.
- The original limestone benches, found in later use in the Sanctuary of Egyptians, will stay there. Replicas will be produced with small inscriptions indicating they are copies. Three original benches found dispersed will be placed in their original location.
- Conservation of east side of the monument, which uses the west wall of a classical building, for protection and for historical and morphological reasons.
- Restoration of the height of the sacred well, with two lines of porous stones, up to the level of the floor of the stoa.
- Anastylosis of the Ionic colonnade of the stoa because authentic parts of the columns and the Doric entablature survive. Re-integrations will restore the morphological continuation while a few additions will be used for static sufficiency reasons. Further findings are: 50% of the column bases on the right, 88% of the column bases on the left, 50% of column bases in the middle (consisting almost 2/3 of the original material). They are reintegrated with natural stone and titanium rods.

- Anastylosis of the stereobate of the colonnade of the ground stoa. Original stones will be reassembled in corresponding locations, placing one or more levels of new stones and covering part of it with earth.
- Partial anastylosis of the euthynteria and the stylobate that survive only in the east end of the building. The euthynteria will be restored with four new plinths and the stylobate with two new plinths of hard porous stone. Nine new members will restore the east end.
- Full or partial anastylosis of the columns of the external colonnade, which originally consisted of 31 columns. Two columns will be fully restored and partial anastylosis will be applied to six columns. The hard porous flutes survive in a particularly good state. Not many interventions are needed since their static stability will be ensured by their weight and their joining will follow the ancient methods.
- Anastylosis of the railing-like parapets of the intercolumniation of the upper colonnade. They are made from hard porous stone and their preservation is fragmentary but satisfactory. Their fragments will be completed with contemporary material and reassembled in their original positions. Their joining will follow the ancient methods. Experimental placing of three non-belonging flutes without joints or fragments proved their stability. Thin plates of lead will be used in-between for perfect adjustment of the surfaces.
- Restoration -to the ancient level- of the natural ground around the monument in order to protect the invisible sides of the stereobate, project the immediate connection of the external and the internal parts of the stoa, and raise the monument to its initial level.
- Anastylosis of the ground floor pillar colonnade. The colonnade is from hard porous stone, which is preserved in a good state. Most of the stone plinths are placed in their initial location and only a few in corresponding locations. The layout of the material will give continuation of the form of the monument, historic information, as well as information for the distribution and use of spaces.
- Reconstruction of the wooden beams with dried wood and stainless metal joints. Measures will be taken for the protection of the surface of the wood.
- Restoration of the staircase, up to eighteenth stair.
- Partial restoration of the Roman buttress opposite the west stoa. Its restoration aims at its elevation and the connection between the stoa and the classic buttress, as well as the connection between the two levels of the building.

Since the approval of the anastylosis proposal and during clearing works on two ancient streets of the sanctuary, a great number of new architectural members from the columns and the parapets were discovered. With the assembly of almost the 2/3 of the original material, possibility of an anastylosis in greater height, than the one initially approved and implemented in most parts, was depicted. It is realised, after unanimous approval by the Central Archaeological Council (Katimertzi 2000, 2).

D2.3 The Propylon of the Gymnasium Complex

D2.3.1 Introduction

D2.3.1.1 Description and history of the Propylon

The Propylon forms part of the Gymnasium complex situated at the south part of the sanctuary (Kyriaki 1999, 34) and defining its south border (Kyriaki 1988c, 44). The complex is dated in the early 3rd century BC (Iakovidis 1979, 136).

The Gymnasium complex is a large square structure with well-constructed ashlar exterior walls, built on porous stone foundations. It had an inner peristyle court, surrounded by hypostyle platforms on the east and west sides, stoas on the north and south sides, and rooms at the corner ends (Iakovidis 1979, 136). The peristyle court had sixteen Doric columns on each side. On its north side, the colonnade was double, the second one being in Ionic order (Palaiokrasa 1988, 21).

The whole complex consisted of:

- the main Gymnasium or Refectory, dated at the end of 4th-beginning of 3rd century BC (Kyriaki 1988c, 44; Kyriaki 1999, 34; Palaiokrasa 1988, 21);
- the monumental Propylon in the northwest, built at the end of 4th-beginning of 3rd century BC (Kyriaki 1999, 34), constituting the main entrance (CCEM 1994, 7). It was in the same line as the west stoa of the peristyle (Palaiokrasa 1988, 21). At the 2nd century AD, it was converted into a temple of Hygieia[5] (CCEM 1994, 7);

[5] Hygieia meaning Health.

- the Odeum, a Roman addition, built at the 2nd century AD (Kyriaki 1999, 34; Palaiokrasa 1988, 21), occupies the north area of the internal peristyle (CCEM 1994, 7).

The Propylon was a formal decorative entrance, on the northwest corner of the main building (Iakovidis 1979, 135; Tomlinson 1983, 41). It consisted of a raised base, with steps at either end, though the normal approach was by central ramps (Tomlinson 1983, 46). It was a prostyle building with a hexastyle Doric colonnade at the north. At the east and west, walls connected it to the 'Gymnasium'. The interior was embellished with in antis Ionic arrangements (CCEM 1994, 8). The roof was of the normal ridge type, with a pediment at either end (Tomlinson 1983, 45-46). The building materials were limestone, durable porous stone, and soft porous stone, varying according to their use in parts of the building. Other materials include wood (for the roof and the ceiling), iron for metal joints, clay for tiles, and plaster of lime mortar (Kyriaki 1988b, 87).

D2.3.1.2 History of excavations and interventions

The Gymnasium was revealed during excavations carried out by Kavvadias on behalf of the Greek Archaeological Association during 1891-1898. The Propylon was revealed in 1884. Excavations in the Gymnasium area were undertaken in 1942-1943 from the French Archaeological School. Until now there was only one brief publication, though not a systematic study, by Kavvadias, and more detailed references by J. Delorme and R. A. Tomlinson (Danali-Giole 1988, 36; Kyriaki 1988c, 47; Palaiokrasa 1988, 21).

D2.3.1.3 State of preservation

Until 1984, no essential measures for the protection of the ruins were undertaken. The appearance of the monument was the result of sequential additions to the initial building, and of destructions and lootings (Kyriaki 1988a, 160; Kyriaki 1988c, 44).

The lower parts of the Gymnasium, all made of hard limestone, and parts of the porous colonnades, were still preserved in situ (CCEM 1994, 7; Kyriaki 1999, 35). Its east part had undergone less destruction. However, the hard limestone presented extensive deterioration that accelerated and led to gradual loss of original material and the downgrading of the monument (Kyriaki 1988e, 48; Palaiokrasa 1988, 21).

The preservation state of the Propylon was not much different from the state it was left after Kavvadias excavations. All dispersed original material and material surviving in situ was exposed on the ground since the first excavations. Further deterioration was caused by time, weather conditions and visitors (Kyriaki 1988a, 160; Kyriaki 1988e, 53). Only the foundation to the level under the euthynteria, part of the paved floor with subjected levels of the podium and the ramp were preserved. Around the paved floor, many architectural members were dispersed (Kyriaki 1988e, 53). The mud-brick superstructure had not been preserved (Iakovidis 1979, 135).

D2.3.2 Theory behind the anastylosis proposal of the Propylon

D2.3.2.1 Reasons and aims of the current anastylosis proposal

Re-assembly of the superstructure will result in protection of surfaces totally exposed, as they will be distanced from the ground and properly treated. The proposed anastylosis aims at indicating the initial form of the building by partial restoration. Where restoration cannot be fully implemented, revelation of other structural characteristics becomes the objective. A significant amount of original material survives. As accelerating deterioration will diminish, the principal aspiration becomes the arrest of deterioration, since the creation of a core of durable structural materials will protect the reassembled members (Kyriaki 1988a, 160-162). Furthermore, the absence of the third dimension of the building is considered a disadvantage since it cannot reveal the scale of the archaeological site (Kyriaki 1988d, 11-12).

D2.3.2.2 Principles and theoretical framework of the works

The anastylosis is characterised by an effort to apply the valid international principles of the Venice Charter (Kyriaki 1988a, 160), together with some further principles, deriving from the Greek experience.

The character of the ancient construction is totally respected and ensured with the use of ancient and new materials in ways similar to the ancient ones (Articles 9, 12 and 15). Simple static forms are used whilst architectural members preserve their self-sufficiency. The original members, when possible, are placed in their original locations. Determination of original location is a matter of systematic study of all surviving information and has been achieved with absolute certainty in the staircase, the euthynteria, and the entablature. In every other case, members are assembled to their corresponding locations. Additions to original members are performed with the use of a pantograph, achieving faithful copying of surviving surfaces and allowing removal of completions without hurting the initial part, in case original parts are found at some point. Consequently, the principle of reversibility is respected. Additions and new members differentiate discreetly from the ancient material, either with different elaboration of visible surfaces or by inscribing the intervention date. Full documentation of all working phases (Article 16) will inform about methods and solutions chosen (Kyriaki 1988a, 161).

In the immediate setting of the monument, numerous architectural members are found dispersed. Most buildings survive in small height, with the exception of the Odeum. In some of them, the surviving material allows future anastylosis, a prospect included in further plans of the CCEM. With this proposed anastylosis, the surroundings of the site will change, upgrading the setting. The Odeum forms a testimony of the Roman phase of the sanctuary. Its imposing presence will be moderated, since a classical building will be restored in full height in its immediate setting. At the same time, incorporation of the restored monument in the site will not create any problems, as it is close to a building that survives almost in its initial height. Re-assembly of dispersed members or their removal for protection in warehouses will result in improving the surroundings, allowing immediate recognition of the outline of the Propylon and the other buildings of its immediate environment (Kyriaki 1988a, 161).

D2.3.3 The anastylosis proposal of the Propylon

D2.3.3.1 The general strategy followed

Detailed documentation and systematic study of the preserved material was conducted, in parallel with architectural clearings and excavation works. These contributed to exhaustive knowledge of the monument, with regard to the static efficiency of the foundations and various structural and chronological questions (Danali-Giole 1988, 36). They revealed numerous architectural members, most of which were intact. The preservation state of material and the possibility of restoring it were assessed. In addition, a programme for conservation of the limestone parts is realised (CCEM 1994, 8; Kyriaki 1999, 35). This programme comprises assembly of fragments of architectural members, with joining mortar for small fragments and internal reinforcement with titanium for larger ones. It includes photographic and graphic documentation of each member before and after conservation and re-assembly (CCEM 1994, 7; Kyriaki 1988e, 48).

The process is supported in its various stages by thorough bibliographical research. Works assisted not only to revise the graphic reconstruction, but also to formulate a restoration proposal (CCEM 1994, 7-8). In some cases, it was necessary to make alterations to the original restoration proposal, always in accordance with the protection and presentation of the monument (Kyriaki 1999, 37-38). The restoration work intends to reset intact surviving blocks to their original positions, construct completions for broken members in initial or similar position, and complete missing parts with new ones (Kyriaki 1999, 37).

Regarding the use of building materials, the focus was on using natural stone in the visible surfaces of the building and artificial stone in the non-visible ones for reasons of speed and economy (Kyriaki 1988a, 162; Kyriaki 1988d, 8). A research program[6] was implemented regarding the composition of artificial stone with natural, mechanical and chemical characteristics harmonious and compatible with those of the original stones (Kyriaki 1988a, 162). It was proved that the construction of artificial stone is more expensive compared to quarrying of natural stone. Furthermore, issues of material incompatibility, aesthetics, and working on natural stone, resulted in the CCEM suggesting the use of natural stone only. The choice of specific kinds of natural stone –in terms of similar composition, texture and colour- is realised through a research programme of IGME[7] (Kyriaki 1988d, 8-11; Kyriaki 1999, 37). Other research programs, conducted in collaboration with the Stone Centre of the Ministry of Culture, are involved with producing a protective mortar for delicate soft porous stones and for cleansing the stones (Kyriaki 1988d, 8-11).

[6] It is the same research programme conducted during the anastylosis proposal of the Avaton.

[7] Institute of Geological and Mineral Exploration

Furthermore, a joining mortar is employed. Its composition will be determined by another research program. Which members should be connected with each other will be determined by the structural study. Titanium dowels will be used in these cases. When titanium is not necessary, fragments will stay unconnected, so that future replacement of new members by original ones will be possible (Kyriaki 1988a, 163).

Regarding the protection of architectural members by placing them in the museum, extensive discussions emphasised the ability of experiencing the architectural monuments by reassembling their members. The CCEM will exhibit members of particular importance in the museum, that due to their special location in the building they cannot be used in anastylosis. There will also be interpretative material -signs with drawings and explanatory texts, diagrams, video programs and models- in order to inform visitors and aid fuller legibility of the site (Kyriaki 1988d, 11- 12).

D2.3.3.2 The anastylosis programme of the monument

The anastylosis programme of the Propylon comprises the following:

- restoration of the floor and the staircases of the podium, fully in the east and partly in the west;
- anastylosis of the level of the euthynteria and the staircase, with re-assembly of members in original locations; full restoration in the east, anastylosis of the west of the staircase at the north;
- surviving material of Doric colonnade and members of the walls will be placed in corresponding locations, especially around the northeast corner; full restoration of two corner columns, two sequent columns will be indicated with their lower drums; full restoration of the east wall in its north part or anastylosis that will stop at its 10th structural member;
- partial anastylosis of the south end of the wall, which is in contact with the north wall of the gymnasium (narrow area connecting the Propylon with the Gymnasium), up to the 3rd structural member;
- restoration of the Doric entablature in the northeast corner;
- exhibition of parts of the frieze and the ionic elements at the west of the building;
- exhibition in the museum of members characteristic of every group (Kyriaki 1988a, 162).

APPENDIX D3: THE HELLENISTIC STOA AT THE ACROPOLIS OF LINDOS, RHODES

D3.1 Introduction to the Acropolis of Lindos

D3.1.1 History and description of the Acropolis and its monuments

Lindos is an archaeological site of Rhodes, surrounding the rock upon which the acropolis stands, combining ancient and medieval monuments and a living village (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1986, 179-180; Misdrache-Capon and Skiadaresis 1977, 33; Papachristodoulou 2002, 19).

Lindos first became important in the prehistoric period, as shown by a few finds that attest to human occupation in the Neolithic and Bronze Ages (Filimonos-Tsopotou and Eleftheriou 2000, 1), and by myths referring to Lindia, an originally pre-Hellenic goddess, whose worship was later identified with that of Athena (Misdrache-Capon and Skiadaresis 1977, 33; Tataki 1979, 38). Archaeological research dates the foundation of the sanctuary of Athena Lindia in the Geometric period (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1986, 180).

During the Archaic period, Lindos enjoyed its greatest prosperity and shared it along with the other two city-states on the island, Kamiros and Ialysos, playing leading role in founding colonies, and in commerce and sea-faring (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1972, 75; Papachristodoulou 2002, 19; Tataki 1979, 38).

It reached its prime in the 6th century under the moderate tyrant Kleovoulos, a great statesman, descendant of the royal house, and one of the seven sages of antiquity. Infrastructure works were undertaken during his forty-year rule, while the sanctuary of Athena Lindia was established as international (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1972, 75; Konstantinopoulos 1986, 180; Misdrache-Capon and Skiadaresis 1977, 33; Papachristodoulou 2002, 19-24).

The Persian expansion in the Aegean Sea in the early 5th century and the foundation and settlement of the City of Rhodes in 407-408 BC contributed in diminishing the financial and political prominence of Lindos (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1972, 75).

The economic prosperity of the Hellenistic period resulted in erection of buildings on a grand scale. The sanctuary complex achieved its final and impressive architectural appearance, with the construction of a monumental Propylaeum, a vast Stoa, and vault structures that lent a tiered perspective and majestic character to the naturally imposing landscape of the acropolis (Filimonos-Tsopotou and Eleftheriou 2000, 1; Tataki 1979, 38).

In the Byzantine period, the acropolis was fortified firstly by the Byzantines and later by the Knights (Tataki 1979, 38). Its defensive character was enforced during the Byzantine, Medieval and Ottoman periods. In 1307 Lindos was seized by the Knights of St. John (Filimonos-Tsopotou and Eleftheriou 2000, 1). Life continued in the Christian years (Papachristodoulou 2002, 22).

The acropolis is accessed through the same path used in antiquity, a narrow staircase (Konstantinopoulos 1986, 180; Papachristodoulou 2002, 28; Tataki 1979, 38). One passes through the medieval wall, ascends the staircase to the palace of the Castle Governor, next to which are the remains of the Byzantine church of St. John, and then reaches the ancient sanctuary (Tataki 1979, 38). Before the staircase, a platform served as pedestal to the statue of a Rhodian notable while on the left a relief depicting the stern of a Hellenistic trireme was carved out of the rock (Filimonos-Tsopotou and Eleftheriou 2000, 1; Konstantinopoulos 1986, 182; Misdrache-Capon and Skiadaresis 1977, 33; Papachristodoulou 2002, 26; Tataki 1979, 38). A series of vaults, dated in the 1st century BC, to right and left of the staircase, support this artificial terrace (Konstantinopoulos 1986, 182; Tataki 1979, 38).

The large Doric Stoa stands before the Propylaeum and gives certain majesty to the approach to the temple (Konstantinopoulos 1986, 182; Tataki 1979, 38). Its façade stands in front of a monumental staircase with 34 steps (Tataki 1979, 38) that leads to the Propylaeum (Misdrache-Capon and Skiadaresis 1977, 33; Pakkanen 1998a, 147). This staircase was built during the 4th century. Only its foundations survive (Tataki 1979, 38).

With the construction of the Propylaeum in the 3rd century BC, the sanctuary achieved its monumental Hellenistic appearance (Filimonos-Tsopotou and Eleftheriou 2000, 5; Konstantinopoulos 1986, 182; Pakkanen 1998a, 147; Papachristodoulou 2002, 26). The Propylaeum was modelled after that of the Athenian Acropolis (Tataki 1979, 38). It is a porticoed edifice, often called the 'upper Stoa' because its core is an outer Đ-shaped Doric colonnade with projecting wings (Filimonos-Tsopotou and Eleftheriou 2000, 5; Pakkanen 1998a, 147). Behind the central row of columns rose the rear wall with five entrances leading into the inner courtyard, lined on three sides by porticoes (Filimonos-Tsopotou and Eleftheriou 2000, 5; Konstantinopoulos 1986, 182; Pakkanen 1998a, 147; Papachristodoulou 2002, 30; Tataki 1979, 38).

At the far end, behind the Propylaeum, the temple of Athena Lindia is oriented northeast to southwest (Misdrache-Capon and Skiadaresis 1977, 33; Papachristodoulou 2002, 30; Tataki 1979, 38). It was erected around the early 3rd century BC, on the highest point of the acropolis where the Archaic Temple, probably destroyed by fire in 392 BC, previously stood. It is a small Doric amphiprostyle tetrastyle temple (Filimonos-Tsopotou and Eleftheriou 2000, 5; Konstantinopoulos 1986, 182; Misdrache-Capon and Skiadaresis 1977, 33; Pakkanen 1998a, 147; Papachristodoulou 2002, 24-30; Tataki 1979, 38). It was given an imposing entrance but is not axially placed with respect to the Propylaeum (Pakkanen 1998a, 147).

D3.I.2 History of excavations and interventions to the monuments

The acropolis monuments remained buried for centuries. In the mid-19th century, the distant location of the site and the refusal of the Ottoman administration to allow visiting, discouraged foreign travellers. Later travellers describe the site and give information about its monuments (Eleftheriou 2002i, 33).

In 1902-1905 the Danish archaeologists Kinch and Blinkenberg revealed the ancient monuments of Lindos (Eleftheriou 2002i, 33; Filimonos-Tsopotou and Eleftheriou 2000, 2; Pakkanen 1998a, 147; Papadimitriou 1988, 169; Tataki 1979, 38). Their two principal aims were to clear the area and reach the ancient remains as fast as possible, and to dig as far as the rock surface. This procedure meant that the excavators were obliged to demolish buildings of later date, leaving no possibility of studying the evolution of the sanctuary (Eleftheriou 2002i, 35; Papadimitriou 1988, 16). The Byzantine church and the Commander's palace survived demolition, perhaps due to their distance from the Hellenistic remains. Clearing and excavation took place on the temple of Athena and the Stoa. They then proceeded in the area between the temple and the Stoa. The remains brought to light suggested the existence of a Propylaeum, which formed a unity with the monumental staircase. Because the building remains were in poor condition, pointing, small repairs and restoration were carried out in 1914 (Eleftheriou 2002i, 35-39; Filimonos-Tsopotou and Eleftheriou 2000, 2; Papadimitriou 1988, 169). The Danish expedition published their work in the first two volumes of *Lindos: Fouilles et Recherches* (Pakkanen 1998a, 147).

Soon after 1912, the Italian archaeological service took over responsibility for the site, but attention was focussed on the towns of Rhodes and Kos, where large excavations were carried out (Papadimitriou 1988, 169). Until 1936, work on the monuments was limited to consolidation and restoration, mainly on structures of the Byzantine and Medieval periods (Eleftheriou 2002i, 37; Filimonos-Tsopotou and Eleftheriou 2000, 2). From the first days of the Italian military conquest of the Dodecanese, ways and mechanisms for ideological support of their presence were explored. Among them was the appropriation of the historical past of the place (Eleftheriou 2002i, 37). Great amounts of money were spent to build a new province, where the fascist ideal in architecture, town planning, organisation and life-style would be demonstrated. The Classical and Roman world of antiquity would bring back glorious memories and support 'national' pride. Impressive restorations of ancient remains seem to have been a general attitude at that time. Intended exploitation of the island as a tourist resort may also have influenced the style and extent of restorations (Papadimitriou 1988, 169-171). The establishment of an Ephorate of Monuments and Excavations and the Historic-Archaeological Institute was not accidental; yet, their contribution to archaeological research was significant (Eleftheriou 2002i, 37).

In the late 1930s, the Italian governor of the Dodecanese ordered restoration of the monuments of the Lindos acropolis (Eleftheriou 2002i, 37; Filimonos-Tsopotou and Eleftheriou 2000, 2; Papadimitriou 1988, 169; Tataki 1979, 38;). The period of his governance was characterised by his personal interest for projection of the 'Greek-Roman idea' as represented by the ancient monuments of the area (Eleftheriou 2002i, 37; Papadimitriou 1988, 169).

Restoration work was undertaken between 1938 and 1940 by the archaeologist Laurenzi and the engineer Paolini (Eleftheriou 2002i, 37; Papadimitriou 1988, 169-170). It seems that Paolini was in favour of less impressive but more authentic interventions, closer to today's concept of restoration (Papadimitriou 1988, 169-170). By 1938, seven columns and a large section of the east wall of the Temple of Athena, as well as twenty-one columns of the Hellenistic Stoa, with part of the corresponding entablature, were re-erected. In addition, the imposing terraces of the Stoa and the Propylaea were rebuilt (Filimonos-Tsopotou and Eleftheriou 2000, 2-5).

The restorers aimed at restoring the architectural ensemble and elating the 'scenic' layout of the monuments. They attempted to use the dispersed ancient material to form legible archaeological entities. The monumental ensemble in the Lindos acropolis represents the tendency for exaggeration and scenery of the Hellenistic period. The result, from an aesthetic point of view, is judged successful, as it showed the value of the architectural ensemble (Eleftheriou 2002i, 44).

However, the extent of the resulting damage was catastrophic to the monuments and soon became apparent (Eleftheriou 2002i, 46; Filimonos-Tsopotou and Eleftheriou 2000, 2). Many surviving elements were assembled in corresponding rather than original locations, e.g. architectural elements from the Propylaeum were utilised in the Stoa (Eleftheriou 2002i, 41; Papadimitriou 1988, 170). Re-assembly of ancient members in corresponding locations, allowed the use of completions, at least in the initial stage of interventions. However, the percentage of new material is much higher (Eleftheriou 2002i, 42).

The greatest problem facing the restored acropolis monuments today results from oxidation of the steel of reinforced concrete joints, which causes expansion and cracking of the concrete and stone. Wind and earth tremors increase destruction rates. The core of restored columns is completed with local sandstone, which has less resistance than the ancient material. Moreover, the carving of drums has destroyed traces of original dowels, which could have allowed today better study of the monument and more authentic re-assembly (Eleftheriou 2002i, 41-46; Papadimitriou 1988, 170). At the same time, ancient connecting points were systematically ignored (Eleftheriou 2002i, 42).

The colour differentiation of the new stones must have been desirable. The size differentiation - new members were of smaller size and dimensions, compared to original ones- must have been a criterion for the Stoa only. In the Athena Temple there is no such differentiation. Morphological restoration of details was undertaken in the surfaces of new members, resulting in homogeneity of ancient members and new completions. Differentiation in columns and cornices is natural, due to the obvious deterioration of surviving material. A positive aspect was the decision of non-intervention in parts of the monuments (Eleftheriou 2002i, 42-44).

The documentation of the anastylosis, including restoration reports and diaries, was not complete and thorough, as confirmed by recent research by the CCAMAL. The drawings were mainly reconstructions of the monuments, rather than according to surviving material. Even the data recorded correctly was not respected during anastylosis. However, rich photographic material can be found in the archives of the Archaeological Service of the Dodecanese and the Italian Archaeological School at Athens (Eleftheriou 2002i, 41).

In 1952, Dyggve, on behalf of the Danish Expedition, did some fieldwork in the acropolis and published his research on the architectural remains in the third volume of *Lindos: Fouilles et Recherches* (Pakkanen 1998a, 147).

The natural deterioration of the ancient material from the sea environment, but mainly from the unfortunately methodology applied and the inappropriate new material, became obvious in the 1960’s (Zervoudaki 2002, 5). Early research, assessing the monuments’ deterioration and examining its causes, together with related treatment proposals, was launched in the 1970s (Eleftheriou 2002i, 47;

Filimonos-Tsopotou and Eleftheriou 2000, 3). In 1985, it became possible to begin systematic research and restoration on the monuments, through a programme co-funded initially by the Archaeological Association of Athens and later by the Greek Ministry of Culture and the European Community (Filimonos-Tsopotou and Eleftheriou 2000, 3; Zervoudaki 2002, 5-6). A three-member committee was established to scientifically guide, program and attend the works of conservation, consolidation and restoration-anastylosis. From 1987 to 2000, two more members were added to the synthesis of the committee, while in 2001 a new seven-member committee replaced the previous one (Eleftheriou 2002i, 48; Zervoudaki 2002, 5).

In 1988, systematic study for anastylosis and implementation of works were undertaken with collaboration of architects and civil engineers. The proposal for the method and extent of intervention in the Hellenistic Stoa and the Temple of Athena Lindia was approved in 1990 by the Central Archaeological Council (Zervoudaki 2002, 5). The main anastylosis work, planned in six consecutive stages, started in 1993 with the Stoa. After the completion of the first four, in the beginning of 2000, the works were transferred to the Temple. Upon its completion the last two anastylosis stages of the Stoa will initiate (Filimonos-Tsopotou and Eleftheriou 2000, 5; Zervoudaki 2002, 6).

D3.2 The Hellenistic Stoa of the Acropolis

D3.2.1 Introduction

D3.2.1.1 Description and history of the Stoa

The large Doric Stoa gives majesty to the approach to the temple (Konstantinopoulos 1986, 182; Tataki 1979, 38). Its façade stands in front of a marvellous monumental staircase, with 34 steps, that leads to the Propylaeum (Misdrache-Capon and Skiadaresis 1977, 33; Pakkanen 1998a, 147; Tataki 1979, 38).

It is a Đ-shaped Stoa with a length that classifies it among the greatest Hellenistic stoas. It consists of two covered wings flanking on both sides the Propylaeum monumental staircase (Eleftheriou 2002h, 49; Filimonos-Tsopotou and Eleftheriou 2000, 4; Misdrache-Capon and Skiadaresis 1977, 33; Papachristodoulou 2002, 28; Tataki 1979, 38). Its 42 columns were formed from seven unequal shafts (Eleftheriou

2002h, 59; Papachristodoulou 2002, 28; Tataki 1979, 38). The two wings, on either side of the Propylaeum staircase, were covered with a roof, ending in pediments in the two facades of the monument and based on the wall and the external colonnade (Dyggve 1960, 232; Eleftheriou 2002h, 80).

It was built on the 3rd century BC, after the Propylaeum and the monumental staircase, and was oriented to the north, facing the temple (Eleftheriou 2002h, 83; Filimonos-Tsopotou and Eleftheriou 2000, 4; Konstantinopoulos 1986, 183; Papachristodoulou 2002, 26; Tataki 1979, 38). It completed the monumental character of the sanctuary, in accordance with the spirit of Hellenistic architecture (Filimonos-Tsopotou and Eleftheriou 2000, 4; Konstantinopoulos 1986, 183; Misdrache-Capon and Skiadaresis 1977, 33; Pakkanen 1998a, 147; Papachristodoulou 2002, 28). Unity of form was achieved by a row of columns along the front of the stairway and the projecting wings (Eleftheriou 2002h, 49; Filimonos-Tsopotou and Eleftheriou 2000, 4; Pakkanen 1998a, 147; Papachristodoulou 2002, 28).

Limestone and sandstone were used from the surrounding area whereas porous stones were plastered with an external coat in two levels, for reasons of protection and aesthetic appearance of the vulnerable material (Eleftheriou 2002h, 49). Morphological details were roughly sculpted in the stone whilst given in plaster (Dyggve 1960, 40; Eleftheriou 2002h, 50). Lead-coated iron joints were utilised (Dyggve 1960, 225 and 232; Eleftheriou 2002h, 51-59 and 74-80).

D3.2.1.2 History of excavations and interventions

In 1914, under the supervision of Kinch, column drums were completed while consolidation and strengthening work was undertaken in the monument (Eleftheriou 2002i, 37; Pikoula 2002d, 96).

In the 1930s, extensive anastylosis activities commenced under the direction of the Italian Archaeological Institute of the Dodecanese. They consisted of gathering dispersed members, irrespectively of their state, and re-assembling them in the monument with reinforced concrete (Pikoula 2002d, 96). Twenty-one columns with parts of the entablature were re-erected. The walls were partially raised and the terrace vaults were rebuilt (Eleftheriou 2002i, 39-41; Filimonos-Tsopotou and Eleftheriou 2000, 2-4). Colour differentiation and size differentiation of new stones must have been desirable. Morphological restoration of details was undertaken in the surfaces of the new members, resulting in homogeneity of ancient and new members. Decision of non-intervention in parts of the monument was a positive aspect (Eleftheriou 2002i, 42-44). Documentation was not complete, as far as morphological and structural aspects were concerned (Eleftheriou 2002g, 87).

The Italian governance was interested in projecting the Greek-Roman idea as represented by the acropolis monuments (Eleftheriou 2002i, 37; Papadimitriou 1988, 169). The Classical and Roman world of antiquity would bring back glorious memories and support national pride. Restoration of ancient remains was a general attitude whereas exploitation of the island as a tourist resort may have influenced the restorations' style and extent (Papadimitriou 1988, 169-171).

The restorers' aim was to regenerate the architectural ensemble and elevate the scenic layout of the monuments in the surrounding environment. Partial anastylosis of the Stoa gave a fragmentary impression for the monument, while omission of anastylosis in the Propylaeum allowed the temple to be visible from the lower level of the Stoa. The restorers used illegible dispersed ancient material to create a legible archaeological entity. The aesthetic result is judged successful as it showed the value of the architectural ensemble, while mistakes are not easily identified by non-specialists (Eleftheriou 2002i, 44).

Despite aesthetics, the extent of the resulting damage was catastrophic to the monuments and soon became apparent (Eleftheriou 2002i, 46; Filimonos-Tsopotou and Eleftheriou 2000, 2). Surviving architectural elements were assembled in corresponding rather than original locations (Eleftheriou 2002i, 41; Papadimitriou 1988, 170). The amount of new material was high. Original material surviving was 90% in the colonnade, though only a 65% was used, while 114 re-erected ancient drums represented the 37% of the ancient construction (Eleftheriou 2002i, 42). The intervention of 1930 was justified, since at that time the limited use of every mean of contemporary technology, especially of the reinforced concrete, was allowed (Pikoula 2002d, 97).

Deterioration of the ancient material from the sea environment, the unfortunately methodology, and the inappropriate material, became obvious in the 1960’s (Zervoudaki 2002, 5). Research to assess the deterioration and examine its causes and treatment proposals were launched in the 1970s (Eleftheriou 2002i, 47; Filimonos-Tsopotou and Eleftheriou 2000, 3). The urgent need of intervention was highlighted by the collapse of a column in 1975. Three anastylosis proposals were formed, but financial reasons and lack of qualified personnel did not allow immediate intervention (Eleftheriou 2002i, 46-48; Zervoudaki 2002, 5).

In 1985, systematic research and restoration initiated (Filimonos-Tsopotou and Eleftheriou 2000, 3; Zervoudaki 2002, 5-6) after a committee (CCAMAL) was established to scientifically guide, program and attend works of conservation, consolidation and restoration-anastylosis (Eleftheriou 2002i, 48; Zervoudaki 2002, 5). In 1988, systematic anastylosis study and implementation works were undertaken (Zervoudaki 2002, 5). The main anastylosis started in 1993 with the Stoa, planned in six consecutive stages. The first four stages were completed by 2000, then the works were transferred to the Temple of Athena. The last two anastylosis stages of the Stoa will initiate on a later date (Filimonos-Tsopotou and Eleftheriou 2000, 5; Zervoudaki 2002, 6).

D3.2.1.3 State of preservation of the Stoa

The Stoa is the best preserved of the three Hellenistic structures (Pakkanen 1998a, 150). A great amount of architectural members from the monuments’ upper structure was discovered, mainly extracted from recent structures, in which they were found in second use (Eleftheriou 2002i, 35).

Large parts of the foundations were preserved, in some places up to the stylobate level. Column drums and architectural elements from the walls were found in situ (Eleftheriou 2002i, 35-37; Filimonos-Tsopotou and Eleftheriou 2000, 4; Pakkanen 1998a, 150). In the west wing, the back wall was surviving in situ, though restored in 1914 (Dyggve 1960, 23; Eleftheriou 2002h, 54; Eleftheriou 2002i, 35). In the southeast corner of the northwest wing, the back wall retained its full height (Pakkanen 1998a, 150). The two separating walls of the wings were preserved in situ in full length, while the sidewalls were destroyed (Eleftheriou 2002h, 57; Eleftheriou 2002i, 35). The east back wall was partially preserved (Eleftheriou 2002i, 35). Architraves do not survive (Eleftheriou 2002h, 74). Part of the frieze of the west back wall is noticed (Dyggve 1960, 229; Eleftheriou 2002h, 75). The cornice of the wall is preserved (Eleftheriou 2002h, 78-80).

The preservation state of the monument in the beginning of the 1980s resulted from natural deterioration and past interventions. Main causes of natural deterioration are the seaside environment, winds, rain, temperature fluctuation, and earthquake activities. Those factors, together with human intervention (looting, incorporation of new buildings in ancient constructions, extraction of structural material) were enough to convert the monument to an open ruin (Pikoula 2002d, 95-96). Yet, the greatest problem results from oxidation of the steel of reinforced concrete joints, which expands and cracks the concrete and stone. Wind and earth tremors increase the potential of destruction. The concrete core of the restored columns is completed with local sandstone, proved to have less resistance than the ancient material. The carving of drums has destroyed traces of original dowels (Eleftheriou 2002i, 41-46; Papadimitriou 1988, 170; Pikoula 2002d, 96). The ancient construction was altered to monolithic. Rules of the construction system were neglected, rendering its behaviour in wind or earthquake unpredictable (Pikoula 2002d, 98).

D3.2.2 Theory behind the recent anastylosis proposal

D3.2.2.1. Reasons and aims of the anastylosis proposal

The main reasons for the current anastylosis is the urgent need of total intervention after the collapse of a column in 1975, the natural deterioration of the ancient material from the sea environment, the unfortunate methodology, and the inappropriate material of the past anastylosis that caused rapid dilapidation of the monument (Zervoudaki 2002, 5). This critical condition demanded rescue of the ancient building material from further deterioration and restoration of its static resistance (Eleftheriou 2002d, 107).

D3.2.2.2. Principles and theoretical framework of the anastylosis

The theoretical framework of the anastylosis works is determined by confrontation of the problems presented by the monument and the results of previous interventions.

The monuments' image, as set for almost 60 years, is the only known form for the archaeological site, while it is impossible to re-use all authentic material due to its quality and deterioration. The effort to combine preservation of form with limited possibility of re-use of ancient material renders these choices exceptionally difficult. It would have been entirely different if the monument derived from excavation (Eleftheriou 2002d, 107-108).

Thus, the framework is formulated by repeating restoration using new technology, when it does not contradict the anastylosis principles. This framework considers past mistakes, as there could be no progress in ideas and methods related to restoration, if these attempts, which we tend to criticise, had not been made earlier (Pikoula and Papadimitriou 2002a, 171). It is based on the Venice Charter, but relative flexibility of its principles is demanded (Eleftheriou 2002d, 108).

According to the charter, intervention does not extend to non-restored parts. Parts that have remained in their original location may occasionally be removed, dismantled or reassembled. Morphological and structural inaccuracies are reinstated on the basis of data deriving in the process (article 9) (Eleftheriou 2002d, 108). The Italian restorations are acknowledged as comprising historical value. Respect is shown towards materials, methodology and morphological restitution of the monument. As the form of the monument has been established in the public conscience for many years, it was decided to prioritise preservation of the form of the entity rather than its material (articles 6 and 11) (Eleftheriou 2002d, 109; Pikoula and Papadimitriou 2002a, 171). Harmonious but discreet differentiation between new and original members is observed (article 12). Reconstruction is refuted and the introduction of new material is limited (article 15). New materials (natural stone, connecting elements, mortars) are subjected to laboratory tests and research (article 10). Archive keeping is undertaken and publications are produced to achieve systematic monitoring (article 16) (Eleftheriou 2002d, 109-110).

Completion of architectural members follows the requirements of the charter. The past restorers were more concerned with the monument as a whole, and there was no sensitivity for details (Pikoula and Papadimitriou 2002a, 171). It is also regarded that the form of the monument responds to the demands of modern society for educational benefits (Eleftheriou 2002d, 109).

Moreover, concepts like reversibility, minimum intervention and authenticity apply to each architectural member (Pikoula and Papadimitriou 2002a, 171). These principles aim at safeguarding eliminated archaeological elements saved in the authentic material. Preservation of the individuality of architectural members and preservation of their static function are significant objectives. Respect for the initial existence of the monument asks for preserving the initial structure, with the specific layout of classical monuments, the free placement of members with fine surfaces, and the absence of connecting mortars (Eleftheriou 2002d, 108-109).

D3.2.3. The anastylosis program of the Stoa

D3.2.3.1 The general strategy followed

The infrastructure works for the implementation of anastylosis were: organisation of the work-sites for storing, cutting and sculpting of stones; consolidation and draining works in reinforced concrete slabs of the vaults of the Stoa; organisation of the underground vault spaces for exhibition of ancient members that will not be used; geological exploration of the island to locate appropriate quarries for extraction of porous stone for completions; study of stones' durability; control of the durability of the rocky slope; study for production of mortars (Zervoudaki 2002, 6). The organisation of the work-site resulted from a series of studies. It is related to the topography and location of the site in relation to the Lindos settlement, the amount of visitors, the form and characteristics of the monument, and the intervention extent (Pikoula 2002c, 183-187).

Research projects facilitate the anastylosis, such as engineering geological studies on the slope instability. The acropolis is capped by ruined antiquities and attracts many visitors, both tourists and scientists. The engineering geological features of the rock-mass and the consequences of its geological history, in relation to locally developed steep morphology can lead to development of potential cliff instability. However, potential stability problems might occur at the circumference of the cliff, causing rocks to collapse and destroying the antiquities (Kazilis and Dalias 1988, 147-151).

Another significant study on the column shafts of the Propylaeum and the Stoa facilitates architectural research and measurement of dimensions that can, in turn, prove useful in further restorations. The study was based on the possibility of testing the computer programs developed for studying the temple of Athena Alea at Tegea (Pakkanen 1998a, 150; Pakkanen 1998b). The results were less significant than anticipated, because the column drum diameter measurements are not reliable (Pakkanen 1998a, 153-154).

The interventions have a saving character, extending only on restored parts, especially in the colonnade, which presents the most serious static problems (Eleftheriou 2002d, 107). Previous completions that are preserved remain as they have, though some columns are restored with more drums (Pakkanen 1998a, 111).

Dismantling of columns and cleaning of ancient members is followed by treatment and assessment as to the feasibility of returning them to their original positions (Eleftheriou 2002f, 110; Filimonos-Tsopotou and Eleftheriou 2000, 3). The condition of the ancient elements was far worse than initially assumed. Corrosion of iron parts, use of reinforced concrete in joining members, and rapid weathering of additional construction material resulted in fractured column drums and deterioration of the podium and foundations (Filimonos-Tsopotou and Eleftheriou 2000, 3). Porous stone is a weak stone, which cannot be fully conserved (Pikoula and Papadimitriou 2002a, 166). Fragmentary ancient parts, which do not preserve their original volume and cannot sustain much load, are replaced by freshly quarried sandstone. The members are drawn, photographed and kept in storage (Eleftheriou 2002f, 110-11; Filimonos-Tsopotou and Eleftheriou 2000, 3; Pikoula and Papadimitriou 2002a, 171). Thus, most ancient members are taken off the monument and some of them are reassembled, not necessarily in the initial location but in that of the previous intervention (Eleftheriou 2002d, 109). Ancient members that do not belong in the monument are removed, while members found in incorrect locations are transferred in correct ones, if possible (Pakkanen 1998a, 110). Since, only a small percentage of ancient material can be re-used, the process is considered more a reconstruction rather than restoration (Filimonos-Tsopotou and Eleftheriou 2000, 3).

The aim was restitution of the structural form of the building, and especially of those characteristics applied by ancient Greeks to safeguard against earthquake actions. The past restoration altered the initial static system into a monolithic one and lead to destruction of structural material. Hence, the ancient techniques were used for theoretical and structural reasons (Pikoula and Papadimitriou 2002b, 143-144). According to the structural study, the basic principles of connecting and joining members and using new material, were established. Main principle was to secure the individuality and homogeneity of every member, achieved through the use of titanium rods, as titanium has double the resistance of iron and is non-corrodible, and mortar, poor in concrete but with earth and lime. The mortar was strictly limited around the rods and not exposed to the environment (Eleftheriou 2002f, 110; Pikoula and Papadimitriou 2002a, 166; Pikoula and Papadimitriou 2002b, 144-147). For joints, laboratory tests examined the strength of the porous stone, which formed the criterion for production of titanium, which was also studied and tested in laboratory (Eleftheriou 2002f, 110; Pikoula 2002b, 164; Pikoula and Papadimitriou 2002b, 146). Bronze was also used for joining members, as it had been successfully used in the anastylosis of the Stoa of Vravrona in Greece (Pikoula and Papadimitriou 2002b, 145). The choice of mortar was based on experimental and laboratory research in the relevant centre of the Ministry of Culture (Pikoula 2002b, 165). Connections are such so that in the case of mechanical forces, not the original or new stones but the connections would break (Pikoula and Papadimitriou 2002b, 146). Hence, earthquake resistance, reversibility and authenticity can be achieved (Filimonos-Tsopotou and Eleftheriou 2000, 3).

The porous stone derived from a contemporary quarry, after laboratory experiments regarding its physico-chemical and resistance features. A relevant study was conducted for porous stone from Cyprus for construction of the architrave members of the east side (Eleftheriou 2002a, 115; Pikoula 2002b, 161-164). Completions of members are done by means of a pantograph. Plaster-casts of missing parts are made and then, using a pantograph, the points of ruptured surfaces are transferred to the new stones, making them exact copies of the missing parts (Eleftheriou 2002f, 110; Pikoula and Papadimitriou 2002a, 171). The choice of natural stone for completions and additions and the correct dimensions of new members contribute to harmonious incorporation of new material, which differentiates in colour and texture. Building phases may be differentiated with a distinctive material, such as thick lead plates. Morphological simplifications are not proposed, as the aesthetic result is doubtful (Eleftheriou 2002f, 110-111).

D3.2.3.2 The anastylosis programme

There are two major stages in the anastylosis program. The first one consisted of direct restoration of five columns of the transverse colonnade, including the collapsed column, and initiated in 1993. During that, new data derived, according to which a new proposal was formed. Planning of further interventions and dismantling of columns in various stages took place to ensure smooth undertaking of operations and avoid the presence of a big work-site in the site (Eleftheriou 2002e, 112).

The following intervention stages were approved for the Stoa anastylosis:

- <u>Stage 1</u>: Anastylosis of five columns (K16-20) of the free colonnade (Eleftheriou 2002a, 115; Eleftheriou 2002e, 112-113). Removal of additions and replacement with new compatible ones, following the ancient construction system, in parts of the crepis, the stairs and the stylobate. Non-action was decided for other parts (Eleftheriou 2002a, 115-118).
- <u>Stage 2</u>: Anastylosis of two columns (K21-22) of the free colonnade (Eleftheriou 2002a, 120; Eleftheriou 2002e, 112-113). Non-action in the first step, replacements of ancient parts with new ones in the second step. Replacement of the ancient slabs of the stylobate where the columns were based, completions of other parts of the stylobate (Eleftheriou 2002a, 120).
- <u>Stage 3</u>: Anastylosis of three columns (K34-36) in the east corner of the monument were three columns with entablature had previously been restored (Eleftheriou 2002a, 122; Eleftheriou 2002e, 112-3). No replacement of original members of the ancient stairs of the crepis. Restoration of non-surviving parts or previously restored parts. The stylobate that had been previously restored with stones of smaller dimensions was now reconstructed according to the new proposal. The columns were restored with replacement of some ancient drums with new ones, while some drums from other columns were placed in corresponding locations. The capitals were replaced by new ones, because their bad state of preservation would not withstand the weight of the entablature. The architraves, constructed by reinforced concrete, were replaced with natural stone. Restitution of morphological elements

had as a prototype that of the ancient architrave which survives in the west back wall. The state of preservation of the ancient slabs of the frieze was sufficient and allowed re-assembly. Morphological elements were formed on the basis of the relevant ancient fragments. At the same time, the fragmented ancient drums were connected with mortar and titanium rods and were placed in the Hellenistic arches (Eleftheriou 2002a, 122-133).

- Stage 4: Anastylosis of four columns (K1, 4, 5, 8) in the west wing of the Stoa (Eleftheriou 2002a, 133; Eleftheriou 2002e, 112-113). These columns had been restored with a small percentage of ancient drums in bad state of preservation and with drums from new porous stone completed with reinforced concrete plaster and cement mortar. In their capitals only small parts of ancient fragments are partially completed from new porous stone. The foundation, the stairs, the stylobate and the wall of this part were fully restored. The columns were dismantled and reassembled. Totally 37 new stone members were utilised in the wall. After necessary completions, the capitals from columns K34-36 were placed on these columns, as they did not have to carry the architrave, while drums of other columns were also utilised. Furthermore, the ancient drums that were fragmented were conserved and placed under one of the Hellenistic arches under the west wing (Eleftheriou 2002a, 133-140).
- Stage 5: Anastylosis of three columns (K38-40) (Eleftheriou 2002e, 112-113).
- Stage 6: Anastylosis of five columns (K23-27) (Eleftheriou 2002e, 112-113).

By 2000 the first four proposed restoration projects were completed and sixteen columns with corresponding part of the entablature and crepis were restored. Work will continue after the restoration of the temple of Athena and will be completed by 2008 (Filimonos-Tsopotou and Eleftheriou 2000, 4; Pikoula 2002a, 193-204).

D3.2.3.3 Assessment and evaluation of the anastylosis

Among the technical problems were the efforts to improve the structural method, with regard to the assembly of column drums. The problems presented were related to the sculpting of new drums, which demanded loads of testing assemblies and some extra sculpting. Furthermore, differences in the measurements created problems in the technical reconstitution of the shafts flutes (Eleftheriou 2002b, 173-175).

Besides, the issue of protection of the external surfaces has yet to be resolved. The ancient coating was functioning as protective. However, various solutions were not considered efficient, so projects are under way aiming at attaining the best possible action (Eleftheriou 2002b, 176-179).

The assessment of the anastylosis methodology indicated that dismantling the entire monument would create various problems. Therefore there was no possibility of researching all the available ancient material. Nevertheless, during anastylosis, no new data emerged, entailing the correct study of the monument and the safety of the choices made (Eleftheriou 2002b, 179).

In addition, the Committee acknowledges the extensive use of new material, which is justified only by deterioration of the original material due to past interventions. However, the intervention in the Stoa is considered exemplary for similar monuments that have been restored in the past and present similar problems (Eleftheriou 2002b, 180).

APPENDIX E (APPENDIX TO CHAPTER 5)
THE HISTORY AND ANASTYLOSIS OF THE CASE STUDIES FROM TURKEY

E1. The Library of Celsus at Ephesus

E2. The Temple of Trajan (Trajaneum) at Pergamon

E3. The Hellenistic Nymphaeum at Sagalassos

APPENDIX E1. THE LIBRARY OF CELSUS AT EPHESUS

E1.1 History of Ephesus

The topography of the library area reflects extensive changes from the Augustan up into the late Roman times. The ensemble, as presented by excavation and restoration work today, never existed in this form in antiquity (Scherrer 2000, 134).

E1.2 The Library of Celsus

E1.2.1 Introduction to the monument

E1.2.1.1 Description and history of the Library of Celsus

The Library, a compact ornate Roman building, forms the finest surviving specimen of its kind (Baker 1994, 2; Bean 1966, 175; Scherrer 2000, 130) and has become one of the principal symbols of the site (Demas 1997a, 140). It occupied the most prestigious site in the city, since the Processional Way began nearby (Koester 1995, 12 and 183). Its façade marks the western end of the lower Embolos and the building adjoins the corner of the south gate of the Tetragonos Agora (Scherrer 2000, 130).

According to Latin and Greek inscriptions, the Library was erected between 114-116/117 AD by the Consul Gaius Julius Celsus Aquila as a library for manuscripts and a heroon for his father and was named ‘Celsian Library’ (Baker 1994, 2-8; Bean 1966, 175; Hueber 1997, 77- 81; Hueber and Strocka 1975, 3-4; Koester 1995, 11 and 184; Scherrer 2000, 130; Wiplinger and Wlach 1996, 31). Its combined function was a quite modern idea, also found elsewhere in the Roman Empire (Hueber and Strocka 1975, 6).

Following the rule laid down by the Roman architect Vitruvius, it faced east to take advantage of the morning light (Bean 1966, 175). In its front was the auditorium where philosophers gave lectures (Cimrin 2002, 27-28). A wide flight of steps, flanked by two statues, led up to an aediculated façade and to the library room (Baker 1994, 13-24; Hueber 1997, 80; Hueber and Strocka 1975, 8; Scherrer 2000, 130; Wiplinger and Wlach 1996, 31). Behind the façade, galleries in three storeys surrounded the remains of a lofty hall. The most significant compositional elements were the alternately projecting and receding members of the façade, arranged so that both the lower and upper stories were subdivided into aligned pavilions. Rows of niches for the book rolls were arranged one above the other on the walls (Baker 1994, 2-13; Bean 1966, 175; Cimrin 2002, 27-28; Hueber 1997, 78; Hueber and Strocka 1975, 3-8; Scherrer 2000, 130-131; Wiplinger and Wlach 1996, 31). The three entrances, in the upper window openings, were arranged between four pairs of columns set one above the other (Hueber 1997, 81; Hueber and Strocka 1975, 8; Wiplinger and Wlach 1996, 31). The floor was built on a vaulted substructure (Baker 1994, 13; Cimrin 2002, 27-28; Hueber 1997, 80). The interior decoration was executed in marble revetments of various colours (Hueber 1997, 80; Hueber and Strocka 1975, 3; Scherrer 2000, 130-131). The marble sarcophagus of Celsus, found intact, was in a vaulted room under the big niche in the middle (Baker 1994, 13-16; Cimrin 2002, 27-28; Hueber 1997, 78; Hueber and Strocka 1975, 3; Koester 1995, 11; Scherrer 2000, 130-131; Wiplinger and Wlach 1996, 31).

The most impressive feature was the two-storied façade (Baker 1994, 16). Its niches were embellished with statues of Sophia, Arete, Eunoia and Episteme, symbolising the wisdom, virtue, knowledge and industriousness of Celsus (Baker 1994, 16-25; Cimrin 2002, 27-28; Hueber 1997, 81; Hueber and Strocka 1975, 3-6; Scherrer 2000, 130; Wiplinger and Wlach 1996, 31). In the frieze figurative carvings of palm and anthemion symbolised death and everlasting life. Four more statues that may have depicted the Celsus family at the higher level have been lost, but their honorific inscriptions may still be read (Baker 1994, 25; Bean 1966, 175).

For all its frontality and symmetry, the Library was not conceived to be seen head-on from afar, but more at an angle in order to appear more complex and spatially uncertain. The façade created a distinct and discrete place to the Agora (Baker 1994, 29; Hueber 1997, 81-83). The curvature of horizontal components, resulting from the increased height of vertical elements towards the centre, gives the illusion of a wider façade, and was deliberately intended by its architects (Hueber 1997, 82; Hueber and Strocka 1975, 8; Scherrer 2000, 130). Walls were from decorated ashlar masonry while the back walls from brick masonry (Hueber 1997, 78; Schmidt 1993, 165).

The library reading room was ruined and burnt down as a result of the invasion of the Goths in 262 AD and an earthquake in 265 AD. Its function and appearance changed completely after it had fallen into ruin. Only the façade was left as the monumental back wall for a nymphaeum, in the 4th century (Baker 1994, 2-8; Cimrin 2002, 27; Foss 1979, 65; Hueber 1997, 77; Hueber and Strocka 1975, 7; Koester 1995, 17 and 65; Scherrer 2000, 132; Wiplinger and Wlach 1996, 31). The transformed building was destroyed by an earthquake in the Middle Ages (Foss 1979, 65; Hueber and Strocka 1975, 7; Scherrer 2000, 132).

E1.2.1.2 History of excavations and interventions

In 1895 the Austrian involvement begun and continues to the present under the auspices of the Austrian Archaeological Institute. Much of the lower Roman city was investigated at that time (Demas 1997a, 136). The Library was uncovered at about 1903 and 1906 under the direction of Heberdey (Demas 1997a, 127-149; Hueber 1997, 77; Hueber and Strocka 1975, 7; Scherrer 2000, 130; Schmidt 1993, 165; Wiplinger and Wlach 1996, 14 and 31). The architect Wilberg drew reconstruction drawings that for half a century were the only illustration of the edifice (Baker 1994, 24; Hueber 1997, 15; Hueber and Strocka 1975, 7; Schmidt 1993, 165).

Even though it was excavated very early, the decision to restore it was not taken until 1970 (Demas 1997a, 140). Anastylosis of the façade between 1970 and 1978 was completed under the direction of the archaeologist Strocka and the architect and construction researcher Hueber (Scherrer 2000, 130-139; Schmidt 1993, 165). With re-erecting the South Gate of the Tetragonos Agora in 1989, the layout of the Library ensemble was expanded and attracted even more visitors (Scherrer 2000, 139), becoming the best known of the many restorations in Ephesus (Demas 1997a, 140).

The Austrian Archaeological Institute has carried out excavations in Ephesus for more than a hundred years, providing for conservation and restoration of findings and re-erection of monuments. It is hoped that the work of recovery and restoration, carried out jointly with the Ephesus Museum Selcuk, under the auspices of the Turkish Ministry of Culture, will serve as a model of co-operation for similar undertakings in the future. The excavations have opened new horizons in research into the civilisations of Anatolia, while the results of this research are submitted, without delay, to the international scientific community (Scherrer 2000, 5).

E1.2.1.3 State of preservation

When the Library fell to the ground, it became buried and laid undisturbed until Austrian archaeologists uncovered it at the beginning of the 20th century (Baker 1994, 2; Schmidt 1993, 165). Among the more significant pieces removed to various museums in Vienna were statues, as well as the Parthian reliefs reused in the 5th century fountain at the base of the steps (Demas 1997a, 136-137; Hueber 1997, 78; Schmidt 1993, 165). Other members were transferred to Izmir (Schmidt 1993, 165).

The ground plan had been relatively well preserved, enabling researchers to see the sizes and positions of various features (Baker 1994, 13). The 17m walls were preserved to a height of 7m (Hueber and Strocka 1975, 3; Schmidt 1993, 165). The inside wall was not preserved, as it was burnt in the fire of 262 AD (Hueber 1997, 79). The façade had fallen forward into the square in front of the west gate of the Agora. Piece by piece the elements were laid out in the Agora. Missing elements were recognised in other locations in Ephesus and in Izmir and were collected together to comprise 90% of the original fabric (Baker 1994, 24; Schmidt 1993, 165).

E1.2.2 Theory behind the anastylosis proposal for the monument

E1.2.2.1. Reasons and aims of the anastylosis proposal-Result

A major impetus for restoration activity at Ephesus derives from the need to impose some order on the chaos revealed upon the excavation of a collapsed city (Demas 1997a, 140). For the Library, the reasons and aims for anastylosis were varied.

The most important reason was the amount of surviving material from the façade and 'the completeness of the excavated remains' (Baker 1994, 24). If enough structural building material cannot be regained, then anastylosis cannot be carried out. It is mentioned that 75% original material survives from the library (Hueber and Strocka 1975, 11) whereas in other publications the amount is up to 90% (Baker 1994, 24; Schmidt 1993, 165). Since, much original material from the entire building was missing, an intervention would result in a 1:1 scale reconstruction with modern material. But it would be isolated, entirely artificial and with no archaeological and historical documented value. This is why only anastylosis of the façade was decided (Hueber and Strocka 1975, 11).

The façade anastylosis was historically justified, since only the façade had served for centuries, either as part of the library or as wall of the monumental nymphaeum. The aim was to make the façade fulfil its old task, to announce to visitors the impressiveness and fame of Celsus (Hueber and Strocka 1975, 11-14), in other words to give a historical insight. The restoration was further rationalized on the basis of its research value for scholars (Demas 1997a, 140).

Another aspect was the handing of the ruins themselves. According to the Austrian Archaeological Institute, ‘anastylosis, in a methodical strict consequence of research, makes historical building processes comprehensible and helps today’s visitor to make a lively picture of the ruined area’ (Wiplinger and Wlach 1996, vii) and gain a real insight into ancient architecture (Schmidt 1999, 64). As stated by Hueber, architectural members could have been kept in warehouses where they would be preserved and where specialists would have access. Disadvantages would be that they would not admonish their real connection (Hueber and Strocka 1975, 10). However, they had actually been deposited in the Agora, exposed to dangers of increasing tourism and forces of nature (Hueber 1997, 78). By connecting them in anastylosis, they could be understood by both laymen and experts. Visitors want to experience the original figure, function and importance of the monument (Hueber and Strocka 1975, 10); they do not want to see romantic ruins anymore (Demas 1997a, 140). Apart from preservation, sensible representation of objects is required. Anastylosis gives information about appearance, height dimension, and protects structure and fabric, as fragments are set against decomposition, human playfulness, fires, rather than lying picturesquely on the ground (Hueber and Strocka 1975, 10). It has been noted though that the restoration of the Celsus Library exemplifies a new phenomenon at Ephesus and in the world of archaeology: the trend towards massive and costly interventions in direct response to the demand for interpretation of monuments to the visiting public (Demas 1997a, 142).

However, the re-erected building would disturb the harmonious impression of the scenery. Therefore, attention was paid to the surroundings of the monument, its relation to the neighbourhood construction and the whole scenery. These demands were met in Ephesus where the site has developed to an open-air museum and half a million visitors visit annually (Hueber and Strocka 1975, 10). Restoration of the

Mazaeus and Mithridates Gate, which stands next to the Library, gives a better visual impression of the size and beauty of the Roman town architecture to the visitors (Hueber 1997, 21; Schmidt 1993, 168). Anastylosis of columns of the agora and the Curetes Street and partial restoration of the theatre give a new dimension to the scenery where the Library is found (Hueber and Strocka 1975, 11).

Additionally, since completion of restoration, the library has become a principal symbol of Ephesus and primary attraction for visitors. Ephesus is recognised as a symbolic link between Turkey and Europe, as principal representative of the Hellenistic and Roman cities that once thrived in Asia Minor. The Library, embodying European values, is used in the marketing campaign for tourism in Turkey, accompanied by the slogan ‘Discover the undiscovered Europe’. At a time when Turkey has been striving to obtain entry to the European Community, such national symbols are important (Demas 1997a, 131 and 141).

Increase in tourism and restoration of monuments were incentives for their extensive use for musical concerts and local festivals. Since its restoration, the Celsus Library has been used for social gatherings and cultural events (Demas 1997a, 130 and 143).

The completeness of the new façade reflects the quality of the work – and should set the standard for comparable work in other ruins (Schmidt 1999, 64). Even so, the re-erection of the 17^{th}-meter-high facade changed the character of the entire site, and the Library became the most prominent ruin of Ephesus: it towers over the remains of other structures, and, since they are lower, their importance is diminished. Even after reconstruction of the Gate of Mazaus and Mithridates and the Tetragonos Agora, the library dominates the site. The intention was to create an architectural ensemble around the central court. It was achieved by integrating the Library pleasingly among the other ruins (Demas 1997a, 140; Schmidt 1993, 55 and 168).

E1.2.2.2 Principles and theoretical framework of the anastylosis

The works on the Library are considered a good anastylosis, because it did not introduce much new material (Demas 1997a, 146-147). The restorers used the Venice Charter as their philosophical guide and referred to their intervention as anastylosis (Demas 1997a, 140; Schmidt 1993, 165). The features of this intervention were:

- recourse to all sciences and techniques (article 2);
- safeguarding of the monument as work of art and historical evidence (article 3);
- use of the restored monument for some socially useful purpose (article 5);
- provisions for the traditional setting (article 6);
- preservation and revealing of the aesthetic and historic values of the monument, based on respect for original material and authentic documents, distinguishable extra work when indispensable, archaeological and historical study of the monument before and after restoration (article 9);
- use of modern techniques for conservation and construction, where traditional techniques prove inadequate (article 10);
- respect for the valid contributions of all periods (article 11);
- harmonious but distinguishable integration of missing parts (article 12);
- not allowed additions (article 13);
- minimum use of recognisable new material (article 15);
- precise documentation with analytical reports, illustrated with drawings and photographs, and publication and distribution of the published material (article 16).

The building does not look as a historical forgery but as a recently created modern ‘artificial’ ruin, a misleadingly dominant structural presence. The result provides an image of the entrance of the former building while the library space remains ruined (Demas 1997a, 146-147; Schmidt 1993, 68).

E1.2.3 The anastylosis of the Library of Celsus

The anastylosis lasted from 1970 until 1978 (Demas 1997a, 146-147; Hueber 1997, 78; Schmidt 1993, 165). Hueber carried out the rebuilding and Strocka led the archaeological research (Hueber 1997, 78; Wiplinger and Wlach 1996, 102). The façade was re-erected with much publicity and acclaim (Baker 1994, 2).

E1.2.3.1 The general strategy followed

There has been no attempt to reconstruct the whole building, as in the case of the Attalos Stoa (Demas 1997a, 146-147). Around 90% or 75% of original material was recovered from excavations in the site and from architectural members transferred to museums (Baker 1994, 24; Hueber and Strocka 1975, 11; Schmidt 1993, 165; Wiplinger and Wlach 1996, 124). Decision was towards anastylosis.

New methods of anastylosis were developed using modern technical devices, resulting in better understanding of ancient building practices (Hueber and Strocka 1975, 13; Scherrer 2000, 39; Schmidt 1993, 167; Wiplinger and Wlach 1996, 124). Whenever problems and questions were presented, the plan was altered accordingly (Hueber and Strocka 1975, 14).

Initially, the blocks of the façade were laid out on the Commercial Agora and were prepared for re-erection in their original positions (Wiplinger and Wlach 1996, 124), only when the original positions could be determined. Members missing in museums were either missing in the modern re-erection or replaced by copies (Demas 1997a, 146-147). Missing column shafts and capitals were produced as exact cast stones. Ornamentation was copied only so far as continuity of form and original light shade effect required. Decoration on pilaster shafts was freely followed in a form similar to the original. Wall surfaces imitated ashlar masonry. Defects in capitals, cornices and frame remained untouched, though smaller defects were filled in with white cement mortar by the sculptor. However, edges and structural lines, which determine the construction of the building, were carefully restored (Schmidt 1993, 167-168 and 253). The age, earlier repairs, restoration and tracks of the collapse of the building remained visible (Hueber and Strocka 1975, 14). The cast stones had a colour suitable to the marble (Schmidt 1993, 167 and 252). Colour and original light shade determined harmony but today's viewers can distinguish original from new parts. New additions had to remain recognisable but adapted themselves harmoniously to the general destruction degree of the building so as to achieve a uniform appearance (Hueber and Strocka 1975, 14; Schmidt 1993, 167-168 and 252-253). Plaster casts of statues were placed in the four aedicule of the lower storey (Scherrer 2000, 130).

Static calculations were worked out and a reinforced concrete skeleton was developed into which the ancient building substance could be fitted. This massive construction was implemented to secure against earthquakes (Demas 1997a, 146-147; Hueber 1997, 79; Schmidt 1993, 165-166; Wiplinger and Wlach 1996, 124). Columns and entablature were re-erected to give the effect of the original building structure, while components not able to carry a load were replaced by new elements, sometimes of different material (Schmidt 1999, 87-88). Epoxy resin connected the iron-concrete construction and the structural members. Plates of lead were put among the joined members (Hueber and Strocka 1975, 14; Schmidt 1993, 166 and 252).

Importance was stressed to the jobs of archaeologists and architects. Archaeologists undertake organisation, discovery of fragments, typological observations and comparisons, establishment of dates and destruction phases. They were regarded partners with architects about the position of construction elements. Architects were considered responsible for fixation of the original position of stones and scientific argumentation, together with planning, realisation and supervision of works, theoretical reconstruction of ancient working technologies, and establishment of static systems (Hueber and Strocka 1975, 14).

Detailed documentation, including photography and drawing, was very important (Hueber and Strocka 1975, 13-14). In addition, the excavation discoveries have been extensively published, though very little appears in English (Koester 1995, xvii). The publication by the Austrian Archaeological Institute gives details about the German version, prepared and printed on the occasion of the hundred-year jubilee of the Ephesus excavations. The revised English edition gives valuable information to those interested in Ephesus, academic specialists and laypeople. The Austrian Archaeological Institute has been fortunate that the Director of the Ephesus Museum and his colleagues agreed to contribute to this work in a modern spirit of international co-operation (Scherrer 2000, 4-5).

Notice boards illustrating the ancient methods of construction and the modern re-erection were set up in the interior of the building (Scherrer 2000, 130), together with an honorary inscription with the reconstruction sponsor and other historical and archaeological information (Hueber 1997, 79-80).

E1.2.3.2 The anastylosis programme of the monument

The intention was to restore only the ornamented marble façade, including the aedicule and the front wall, leaving the interior walls and space in a ruinous state (Demas 1997a, 140; Schmidt 1993, 165). The stone masonry at the back was not reconstructed. The building remains in a partially ruined condition. A close look reveals the use of original broken elements (Demas 1997a, 146-147).

In 1970 preparations were made and all material was documented (Hueber and Strocka 1975, 11; Vetters 1971, 37). Later, the work continued on laying out architectural fragments (more than 700) and doweling broken pieces. The space in front of the library was prepared for the heavy crane (Hueber and Strocka 1975, 11-12; Schmidt 1993, 166; Vetters 1972, 43). A photogrammetrical record of the building was made, and control excavations were completed, resulting in some alterations to the earlier plan. On the Tegragonos Agora, 80 more architectural elements were recovered during clearance. A geological study of the area resulted in identification of 16 new quarries and the 45 sorts of marble found at Ephesus were subjected to mineralogical analysis (Vetters 1972, 43).

In 1972 preparatory work was completed with dismantling of the façade remains and investigation of the load-carrying capacity of the foundations and the actual re-erection begun. Afterwards, the first floor was reconstructed (Schmidt 1993, 167; Vetters 1974, 31-36). In the next years, the wall of the lower storey was rebuilt up to the architrave. The columns of the front and upper storeys were all set in place (Vetters 1976, 40; Wiplinger and Wlach 1996, 124).

By 1976 the lower storey was erected, and the coffered ceilings were placed in position. The back wall of the next storey was also built (Vetters 1977, 39). Later, the first preparatory work on the façade was carried out. Preparations of a new overall plan begun, based on photogrammetry. In September, the last stone was placed ceremonially on the façade (Vetters 1978, 20; Wiplinger and Wlach 1996, 124).

APPENDIX E2. THE TEMPLE OF TRAJAN (TRAJANEUM) AT PERGAMON

E2.1 Introduction

E2.1.1 The city of Pergamon

Pergamon is located in the north Aegean region of west Turkey. The history of the city began in the archaic Age, but the main findings belong to the period after Hellenistic Age. It is one of the rare cities that preserved the characteristic structural inheritance of the Hellenistic Age until today (Tuna 2001, 3-5).

The ruins of the city are divided into the following areas:

- The fortified hill (Acropolis), founded on a hill of 275 metres (Nohlen 1985, 140; Tuna 2001, 23). It comprised of the upper citadel – with sanctuaries, king palaces, and the living quarter – and the lower acropolis, including the sanctuary of Demeter, the gymnasium, and the lower market (Radt 1973, 58). It was a main habitation centre of the Hellenistic and Roman Ages and a significant acropolis due to its strategic positioning and magnificence (Nohlen 1985, 140; Tuna 2001, 3-8).
- The Roman city with large buildings – the 'Red Hall', the amphitheatre, the theatre, the stadium (Radt 1973, 58) – none of which is preserved to its original height. The city was built on artificially constructed terraces (Bean 1966, 73).
- The sanctuary of Asklepios, a health centre, in the front of the city (Radt 1973, 58; Tuna 2001, 3).
- The ancient tombs dispersed around the city (Radt 1973, 58).

E2.1.2 Monuments of the Pergamon Acropolis

The upper Acropolis comprises the following monuments:

- The Heroon, a large building arranged around a peristyle court (Radt 1973, 63). The Heroon cult consisted of a place of worship built on behalf of the Pergamon kings, in the age of King Attalos I, but was altered during the Roman age. It was called Attaleion and Eumeneion as well (Tuna 2001, 28).
- The Door of Acropolis, built in the age of Eumenes II, who reigned Pergamon between 197-159 BC. Visitors enter the upper city remains in the centre through the main entrance that had the same function in the ancient ages too (Tuna 2001, 28).

- The Palace Entrance and the Palace of Eumenes II. These are found right in the north of the main entrance of the upper acropolis area and near the east walls. They were buildings functioning as the palaces of Pergamon kings. In the centre of this palace, built in peristyle style, a courtyard was surrounded with adjacent living areas (Tuna 2001, 28).
- The Palace of Attalos I, found right next to the palace of Eumenes II. It forms a relatively smaller palace built for Attalos I, the king of Pergamon between 241-197 BC. This palace has a courtyard surrounded by living rooms. In contrast to the stone columns of the former palace, the columns of this courtyard were made of wood, but no remains have survived today (Tuna 2001, 30).
- The Residences. Going out of the Palace of Attalos I, on the north side there are the remains of the residences where most probably the king's men and generals lived. Unfortunately, no important remains have survived today (Tuna 2001, 30).
- The Barracks and the Tower of Command. This is a Hellenistic complex consisting of adjacent rooms with a big courtyard in the middle. The tower of the complex probably served as a tower of command (Tuna 2001, 30-31).
- The Arsenals magazines, seen a little lower than the rest of the buildings. Their construction began in the Hellenistic Age and improved in the next periods. These magazines with wooden decks consist of five main buildings parallel to each other to store military materials (Tuna 2001, 31). The barracks of the royal troops of the citadel are located southeast. The northeast wall of these barracks is the best-preserved portion of the Hellenistic fortification of the citadel (Radt 1973, 69).
- The Library. The Pergamon library was famous as one of the two richest libraries of antiquity. It is accepted as the only library of the Hellenistic Age that has survived today. It is located on the sacred area between the Temple of Traianus and the Temple of Athena, and consists of four (Tuna 2001, 36) or five (Bean 1966, 74) adjacent rooms. On a pedestal standing in front of the north wall was a marble copy statue of Athena Parthenos. The statue was brought to light during cleaning activities and then was delivered to the Pergamon Museum of Berlin (Tuna 2001, 37).
- The Hellenistic House, a large residence consisting of rooms (Tuna 2001, 38).
- The Temenos of Athena, one of the oldest buildings of the acropolis, constructed in Doric style. Unfortunately, no remains have survived today because its stones were later removed and used for the construction of other buildings. Only some pieces of the foundation may be partly seen (Radt 1973, 65; Tuna 2001, 38-40).

- The Theatre, on the south slope of the library and the Hellenistic residence. It was built from andesite that has survived until today. It was the steepest theatre of the ancient times, known as the most attractive theatre of Asia Minor, and was built for 10000 people. It was probably built in the 3rd century BC, during the reign of Eumenes II, and then altered at the Roman Age (Tuna 2001, 41). The problems presented in construction by the steep lay of the land were especially well brought out in the theatre of the citadel with its unique architectural solutions. This is why it was built on the edge of the steep west slope of the acropolis (Radt 1973, 70).
- The Terrace of the Theatre. The Theatre was built at the north end of the terrace with 250 metres length in the form of a fortress located right in the back of the orchestra. Ancient people of Pergamon were entered the door with two arches located in the south end of the terrace way in order to reach the temple (Tuna 2001, 42). Very little now remains of this stone building (Bean 1966, 78).
- The Temple of Dionysos, located in the north end of the terrace way and built of andesite stone in 2nd century BC. In the Roman Age, it was renovated with marble in Ionic style. The prostyle temple had an entrance with four columns supported by monumental stairs of 25 marble steps (Tuna 2001, 44). It is comparatively well preserved. The walls are standing to a certain height, and the flight of steps in front is still in place. Considerable fragments of the columns and the ornamentation survive. The existing structure is a rebuilding of a Roman date (Bean 1966, 78).
- The Altar of Zeus. Only the foundation stones and stairs remain from the famous Altar of Zeus, which was accepted as one of the seven wonders of antiquity. During the construction of the road passing nearby, the German engineer Humann found relieves of the famous altar by chance. In 1878 the Germans took the permission of the Ottoman government to start archaeological excavations. During the excavations, 132 panels and 2100 pieces, which belong to the marble relieves depicting the wars between gods and giants, together with the other architectural pieces were taken to Berlin where they were restored, reconstructed and remounted as originally as possible. This Museum was named the Pergamon Museum, due to the big amount of pieces taken from Pergamon. This altar, built in the Hellenistic Age (Tuna 2001, 46), constitutes the masterpiece of Pergamene, and perhaps of all Hellenistic art (Bean 1966, 77). In addition to its architectural structure, the altar owes its fame to the extraordinary relieves and wall paintings describing the wars between giants and gods on its outside walls (Tuna 2001, 46). Today, only the foundation is preserved on

the site of the Great Altar of Pergamon, but enough fragments were found to permit an almost complete restoration (Bean 1966, 75; Radt 1973, 64). It stood in the centre of a broad square, the entrance to which was on the east side, while the altar itself was ascended by a staircase on the west. The visitor to the sanctuary, therefore, would be compelled to circle the building on one side or the other in order to reach this staircase on the front of the altar (Radt 1973, 64).

- The Official Agora (Upper Agora), constructed in the Hellenistic Age. The remains are found in the large area in the south of the Altar of Zeus. The large square of the Agora built in Doric style was surrounded by andesite stoas from the southwest and southeast. This area probably formed the Agora temple built on behalf of Zeus or Hermes. Despite being in Doric style, the architecture of this temple also showed Ionic qualities (Tuna 2001, 50). The market was surrounded by Doric stoas as far as the terraced lay of the land would allow. The stoa on the south side had a two-storey substructure, whose rooms served as storerooms (Radt 1973, 65).

E2.2 The Temple of Trajan

E2.2.1 Introduction to the monument

E2.2.1.1 Description and history of the monument

The Trajaneum is one of the most prominent monumental structures visible today at Pergamon, situated on the north end of the upper acropolis. One of the most splendid Roman buildings, it was built by and dedicated to the deified emperors Trajan and Hadrian, in the 2^{nd} century AD (Nohlen 1985, 140; Nohlen 1991, 31; Nohlen 1997, 185; Nohlen 1999, 91; Radt 1973, 68; Schmidt 1993, 173; Tuna 2001, 32).

The temple stood on a platform, more than half of which was artificially created with powerful vaults and retaining walls on the southwest (Nohlen 1985, 140-142; Nohlen 1991, 31; Nohlen 1997, 188; Radt 1973, 68; Schmidt 1993, 173), because originally the rock of the citadel fell away steeply (Radt 1973, 68). The adopted engineering solution was in accordance with the principles of Hellenistic architecture. It made possible using the mountain slope and resulted in saving great amounts of structural material (Nohlen 1985, 142-153).

The temple was built out of white marble, as opposed to the Hellenistic buildings usually made of andesite stone, and dominated the aspect of the citadel hill. It was peripteral (6 columns in front and back and 9 or 10 columns on sideways), of the Corinthian order, built on a podium with a stairway on the southwest (Nohlen 1985, 140-142; Nohlen 1991, 31; Nohlen 1997, 188; Radt 1973, 68; Tuna 2001, 32).

On its three sides, it was surrounded by stoas (Nohlen 1985, 141; Nohlen 1991, 31; Nohlen 1997, 188; Radt 1973, 68; Schmidt 1993, 173). The northern stoa stood on a higher terrace (Nohlen 1985, 141; Nohlen 1991, 31; Radt 1973, 68). The high retaining wall on the southwest has its own architectural impact, created by round moulding and arched openings of the vaulted plaza substructure (Nohlen 1985, 143; Radt 1973, 69). It was never entirely buried after the destruction of the sanctuary and was repeatedly repaired during the Byzantine times (Nohlen 1985, 143).

E2.2.1.2 History of excavations and interventions

The first excavations on the acropolis took place between 1878-1886 under the direction of the engineer-researchers Umann and Conze on behalf of the Berlin Museum (Tuna 2001, 8). In 1874 the architects Stiller and Raschdorff excavated the temple. Architectural fragments were taken to Berlin and were reconstructed for the most part. They can now be seen in the Pergamon Museum. Following a second excavation season, the results, including detailed reconstruction drawings of the Trajaneum, were published in 1895. The ruin itself remained untouched and in a messy state (Nohlen 1985, 143-144; Nohlen 1991, 32; Nohlen 1997, 185; Nohlen 1999, 91; Schmidt 1993, 173).

These excavations enlightened the historical significance of the acropolis and inspired periodical excavations until today. Extensive excavations started in 1900 by Germans and continued until 1913, under the direction of Dorpfeld. Important buildings were brought to light. Activities stopped due to the First World War, but in 1927 a team guided by Wiegand initiated research again, until the Second World War. In 1957, a fourth stage began in the leadership of Boehringer (Tuna 2001, 8-9), who represented the German Archaeological Institute (Nohlen 1985, 145).

In the early 1960s, the Turkish authorities expressed a wish for enhancement of the presentation of the site. The German Archaeological Institute took it upon itself to restore the Trajaneum and develop the site presentation (Nohlen 1991, 31-32; Nohlen 1997, 185; Nohlen 1999, 92; Schmidt 1993, 173). Regular activities of excavation and restoration after 1972 were supported by the co-operation of the German and Turkish governments (Tuna 2001, 9-10). These efforts continue today. Radt led the excavations on behalf of the German Archaeological Institute of Istanbul and made discoveries about the history of the Pergamon (Nohlen 1985, 145; Tuna 2001, 10).

E2.2.1.3 State of preservation

The substructure had been preserved fairly well but, after the front sections of the vaults collapsed, it was filled with debris and building stones (Nohlen 1997, 188; Nohlen 1999, 92). On the hillside, marble blocks were protected by earth accumulations. Western terrace vaultings and the western building had totally collapsed. On the eastern section, the platform was preserved to a greater extent. No part of the north wall was survived in full height. The ashlar of the northern stoa had been destroyed (Nohlen 1999, 97). The wall of the valley side was mended partly during Byzantine times and was found in good state (Nohlen 1985, 154). A great number of ancient elements from the temple survived (Schmidt 1993, 173-174).

Only the foundations of the statue bases, resting on the paving of the plazza, could be seen (Radt 1973, 69). Heads and other pieces from colossal statues of Emperors Trajan and Hadrian were discovered and are exhibited today in museums in Berlin, Pergamon, Istanbul and Paris (Radt 1973, 68-69; Tuna 2001, 10 and 32).

E2.2.2 Theory behind the anastylosis

E2.2.2.1. Reasons and aims of the recent anastylosis-Results

The reasons and aims of the anastylosis are explained along with the description of works. The main aim was identical to the international definition of anastylosis, the re-assembly of existing by dismembered parts of the monument (Nohlen 1999, 101), especially since a great number of elements survived (Schmidt 1993, 173-174).

A previous extensive reconstruction project (suggesting the rebuilding of both pediments and the roofing of parts of the halls) was refuted (Nohlen 1999, 101).

Restorers had the chance to follow the 20th century restoration methods and principles (Nohlen 1997, 185).

The decision to renew the work afforded opportunities not only for conservation but also for archaeological investigations. Generally, anastylosis served various research aspects, especially with regard to precise investigation and systematic documentation. Understanding the construction process offered possibilities for scientific results, especially with relation to civil engineering issues. Questions were answered with regard to the topography of the temple, its construction phases, later use and destruction (Nohlen 1985, 145; Nohlen 1997, 189; Nohlen 1999, 101; Schmidt 1993, 176-177).

At the same time, the excavation and the ancient architecture would be more clearly and effectively presented (Nohlen 1991, 33; Nohlen 1997, 191-196; Schmidt 1993, 173-174). Visual guidelines for visitors would be provided, enabling them to imagine the dimensions and splendour of the monument, as well as its location and arrangement in the site (Schmidt 1993, 145; Nohlen 1999, 101). Often, even for informed viewers it is difficult, if not impossible, to decipher complicated excavation findings. By reassembling available components, visitors get a picture of the original architecture and become able to understand proportions, dimensions, construction and decoration. The task of Archaeology is to prove this understanding on a scientific basis with the help of restoration technologies and static protection (Nohlen 1985, 144). The connection of architectural members would become clearer and recovery of the third dimension would be achieved (Nohlen 1997, 188-191). The exposed antique vault would give an impressive image of the achievement of the Roman engineer; the re-assembled marble architecture of the halls would offer a valuable insight; the other restoration works would elevate the ornamentation of the building (Nohlen 1985, 168; Schmidt 1993, 176-177).

The partial nature of the re-erection was in the interest of preservation and necessary for understanding its history, as the restored building made clear the historical topography of the place (Nohlen 1985, 145; Nohlen 1991, 33; Nohlen 1999, 99-100). Existing architectural elements would be protected against deterioration, decomposition, wind, rain, humidity, root spraying and vandalism by restoring them to their original places (Nohlen 1985, 145; Nohlen 1991, 33; Nohlen 1997, 188-196; Nohlen 1999, 101; Schmidt 1993, 176-177). Restoration work in the substructure was necessary for its lasting preservation and for ensuring the safety of the work, the workers and the visitors in the area (Nohlen 1985, 145; Nohlen 1999, 92; Schmidt 1993, 176-177).

Political considerations played an important role. In Turkey, monument preservation is related with granting an excavation approval, and aims at promotion of tourism as an important part of the industry (Nohlen 1985, 144-145; Nohlen 1997, 185-186). Restoration was a gesture of gratitude towards the host country for the research opportunities it has long provided and a kind of economic help (Nohlen 1985, 144-145; Nohlen 1991, 31-32; Nohlen 1997, 185; Nohlen 1999, 92; Schmidt 1993, 173).

E2.2.2.2. Principles and theoretical framework of the works

Initially, the concept and planning of the works were based on the idea of a big expenditure in the short term. Only after Nohlen was appointed as a construction researcher and later as a site manager, and due to influences of restoration at Ephesus, reconstruction changed to anastylosis. It was planned with a view of a less engineering approach to be achieved with easier means (Schmidt 1993, 179). Anastylosis was considered a window in the history of monuments. The question was whether everything could be shown at the same time, as later construction phases and materials did not become apparent until during the works (Nohlen 1997, 190).

A basic condition of the anastylosis was the independence of structural members, since original members could be moved again in their original position (Nohlen 1997, 185). Another principle and prerequisite was the precise investigation of the building (Nohlen 1985, 148). It was acknowledged that the areas of research and reconstruction would not be separated, but that reconstruction would be a conversion of the research results (Schmidt 1993, 174). When sufficient information about the architectural elements could not be reached by any method, a possible solution was suggested or they built nothing at all (Nohlen 1999, 95). New material was included due to architectural reasons. The didactic result, as opposed to aesthetics and authenticity, was clarified and defined by architectural reasons (Nohlen 1997, 191).

A guiding principle was that it should always be apparent that the structure, though of ancient appearance, had been re-erected. The monument should not look as though it was standing there since antiquity (Nohlen 1999, 101). The facts that the construction was completely destroyed and that architectural parts were joined in modern times would not be obscured (Nohlen 1991, 33). Anastylosis would not signify production of the building, but give a recollection of its last phases and an image of the temple in its exact surroundings (Nohlen 1997, 195). Thus, the architect-restorer acknowledged the fact that the effect of completeness, as illustrated in drawn reconstructions and in construction descriptions, diagrams and models, could never be achieved in anastylosis (Nohlen 1985, 144; Nohlen 1999, 101).

The real dimensions, especially the third, were reached (Nohlen 1997, 185). Despite provisions for limited and partial anastylosis, the result is considered an extensive partial reconstruction, more like a modern ruin with its own architectural and aesthetic qualities (Nohlen 1985, 146; Schmidt 1993, 173-177). Yet, the re-erection preserves the integrity of the temple, while enables the visitor to imagine the original splendour of the monumental building (Nohlen 1999, 91). However, the monument stands there alone and unintentionally imposing the impression of misalignment between Hellenistic and Roman architecture. There is no care for the surroundings, especially the nearby library and the Athena sanctuary, which are Hellenistic and are preserved in foundations (Nohlen 1985, 146). However, by being partial, the temple better integrates into the surrounding ruins (Nohlen 1997, 191).

E2.2.3 The anastylosis programme of the Trajaneum

E2.2.3.1 The general strategy followed

The anastylosis plan was presented to the Turkish authorities that agreed on its implementation. A committee, established by the German Archaeological Institute, consisted of experts who supervised the planning and realisation of the works. Turkish authorities were represented by a commissioner (Nohlen 1991, 32). Disciplines that collaborated were archaeology, architecture, ancient history, conservation, civil engineering, photography and illustration. Skilled stonecutters came from Germany and assisted in the training of Turkish workers (Nohlen 1991, 31-32; Schmidt 1993, 174).

Archaeological investigations of the site concluded in clarifying topography and cultivation of the area. Below the sanctuary, Hellenistic occupation levels were reached, providing important information about the later use and destruction of the site (Nohlen 1985, 151; Nohlen 1991, 31; Nohlen 1997, 185; Nohlen 1999, 93).

In the substructure, whenever necessary to complete the walls, the antique style of building was followed. A 'red joint' of mortar served to distinguish new stonework from the ancient structure (Nohlen 1985, 154-158; Nohlen 1999, 93; Schmidt 1993, 174-175). Broken vaults were consolidated up to the ancient construction joint over the passageway (Nohlen 1997, 154; Nohlen 1999, 93). Missing parts of the vaults were, like the original, set using rubble stones and mortar fill (Nohlen 1999, 93). Byzantine elements were preserved and secured (Nohlen 1985, 155; Nohlen 1999, 93). These extensive but unobtrusive works were dictated, not for reasons of completeness, but in order to circumscribe the temple base and allow passage through the vault without danger (Nohlen 1985, 155).

The first task was complete documentation of all existing architectural elements. Although the work of the first excavators was excellent for its time, documentation was incomplete, recording only the most outstanding elements (Nohlen 1999, 91-94). That restrained the abilities of the recent restorers (Nohlen 1997, 188), as they were unaware of the location of not documented structural parts (Nohlen 1985, 150). Therefore, exact measurement, meticulous documentation and careful observation of all remaining architectural elements became essential (Nohlen 1985, 145-150; Nohlen 1991, 32; Nohlen 1997, 188; Nohlen 1999, 94; Schmidt 1993, 175). Photogrammetry was utilised for grasping all points of the building (Nohlen 1985, 147). Drawings were complemented by photographs (Nohlen 1985, 148; Nohlen 1999, 94; Schmidt 1993, 175). Documentation and recording played a major role in the theoretical reconstitution, in planning the structure, in essential preliminary work for joining fragments and assigning members (Nohlen 1985, 148; Nohlen 1999, 102), for illustrating the scientific text and for the clear presentation of the monument (Nohlen 1997, 186). After documentation, the architectural members were stored according to their types, hence providing a clear overview about their condition and allocation. The theoretical reconstitution followed (Nohlen 1985, 156).

To avoid wrong interpretations and improve the joining of elements, stone members were cleaned from dirty crusts and lichens (Nohlen 1985, 148). Discoveries that assisted in planning the theoretical reconstitution came from archaeological and architectural investigations, and from fitting together broken parts and checking their sequence. This work yielded further important information, such as the total height of the temple, the exact location of the stylobate of the northeast corner, the height of the side hall (Nohlen 1985, 149-150; Nohlen 1997, 189-191; Nohlen 1999, 94).

When the preserved fragments yielded sufficient information, they were joined together and restored to their original position, provided they could give precise indications regarding the total structure (Nohlen 1985, 147; Nohlen 1997, 191; Nohlen 1999, 91 and 97). Epoxy resin was used as glue. Rods of titanium-stabilised stainless steel were drilled in, to make fractured surfaces fit easier. The drill holes differed in depth, so as not to strain the marble. They were deeper than the rods length and had a certain distance from the outside surface to avoid tensions. The rods had to ensure stability over the long term, as there was no experience of the synthetic resins durability (Nohlen 1997, 194; Nohlen 1999, 97; Schmidt 1993, 175). In higher elements, which are not subject to tension, the steel was replaced by fibreglass to minimize risk of lighting (Nohlen 1999, 97).

Breaks, gaps and small defects, were -if possible- left visible, in order to retain signs of age. Where necessary, missing parts were added as recognisable modern components, made by artificial stone of crushed marble and white cement (Nohlen 1985, 157-158; Nohlen 1997, 191; Nohlen 1999, 97-98; Schmidt 1993, 174-179). Initially, it appeared cheaper and easier to produce missing parts in natural stone, but that was rejected later (Schmidt 1993, 179). All treatments produced material of high quality, which will age without problems: no armature was placed in the concrete of new blocks (Nohlen 1999, 98). The material was skilfully worked so that the sparkle of the marble grain yielded a lively surface (Nohlen 1985, 158; Nohlen 1997, 191; Nohlen 1999, 98).

While new materials are easily distinguished from old, the visual continuity of the structure is unharmed. When new architectural elements were added, only profiles and major features were indicated, completing basic lines but not competing with the ancient ornamentation. As each abstraction of form of sculptured shapes results in alteration of volume, experimentation proved that it was important to reconstruct entire forms, carved by stonemasons (Nohlen 1985, 147-158; Nohlen 1997, 191-192; Nohlen 1999, 98; Schmidt 1993, 175). Casts were used in a few cases for structural elements of identical form. Flutes were added to the new columns drums, exactly as their working was done in antiquity, because flutes are an essential feature of the column (Nohlen 1999, 99). The flutes of the restored column parts were worked on after the assembly of drums, on the standing column, from the top downwards, as it was done in antiquity (Nohlen 1997, 191; Nohlen 1999, 99).

The use of advanced technology facilitated the shifting and re-assembly of members without damaging them and their ornamentation (Nohlen 1985, 148-149). Modern additions, installed to protect visitors, were designed in modern style but are unobtrusive and in harmony with the appearance of original elements. New stairs and paths of andesite lead discreetly through the site. In order to limit plant growth, newly installed floor levels were paved with quarry stones (Nohlen 1985, 159; Nohlen 1999, 100-101). Information regarding the anastylosis is available to visitors while they are guided through pathways in the site (Nohlen 1997, 195).

Regarding statics, all parts of the structure work as independent blocks. However, missing connections to rigid elements necessitated strengthening of certain links, with newly inserted connection dowels (Starosta 1999, 89). Hence, the re-erected columns are not connected with internal constructions, as in antiquity. The reason is that, since the columns are incomplete, the building cannot rely on the original system but it has to be stable. Safety measures against potential earthquake damage were taken with the view that in such a case, the steel would reach breaking point before the elements collapse, but will not be shattered (Nohlen 1985, 159; Nohlen 1997, 194; Nohlen 1999, 99; Schmidt 1993, 175-179; Starosta 1999, 89).

The parts not used in anastylosis, because too much new material would be needed to replace them in their original locations, were arranged, classified into types, as parts of an on-site exhibition. Sometimes, numerous fragments belonging to one part were combined to show the correct architectural coherence, but not the three dimensions (Nohlen 1985, 146; Nohlen 1997, 194; Nohlen 1999, 99-100).

The work-site was arranged east of the temple and included workrooms for draftsmen and stonecutters, together with depots for ceramics and stones. Scaffoldings, trucks, cranes and smaller devices formed a sophisticated technology, which can be obstructive but was carefully operated (Nohlen 1985, 153).

E2.2.3.2 The anastylosis programme

The substructure was restored after debris and building stones, reaching up to the vault spring, were cleared out and endangered parts of walls or vaults were repaired (Nohlen 1985, 154-155; Nohlen 1999, 92).

According to the anastylosis strategy, the silhouette of the re-erected sections followed the slope of the hill (Nohlen 1997, 191; Nohlen 1999, 97; Schmidt 1993, 174-175). On the hillside, numerous blocks were protected by accumulations of earth. Their re-erection facilitated the integration of the rebuilt parts within the surrounding ruins (Nohlen 1997, 191; Nohlen 1999, 97).

Furthermore, the temple was divided into two sections, leaving the western part almost unrestored, mostly as a ruin, as the western terrace vaultings and the western part of the building had totally collapsed. An exception was made for three columns of the western stoa, so as to indicate the width of the terrace (Nohlen 1985, 159; Nohlen 1999, 97; Schmidt 1993, 175-176).

Restoration concentrated on the eastern section, where the platform surrounding the temple was preserved to a greater extent. Further rebuilding of the wall of the hall using artificial ashlars emphasised that it is a restoration and not a relic from the ancient world (Nohlen 1997, 191; Nohlen 1999, 97; Schmidt 1993, 175-176). As the ashlar on which the northern stoa stood had been destroyed, a row of columns was placed above the eastern temple court and opposite the temple pediment. In this way, the eastern part, with the north and east stoas and the northeast corner restored to full height, gives a three-dimensional impression of the temple and its interplay with the surrounding structures (Nohlen 1999, 97).

E2.2.3.3 The stages of the excavation and anastylosis program

1965-1975: Long preparatory work and overview of the available structural members and plans for copying new members (Nohlen 1985, 145; Schmidt 1993, 173-174).

1973: Continuation of the survey initiated in previous campaigns (Radt 1974, 48).

1974: A start was made on the clearance of the vaulted substructure of the Trajaneum, which was piled high with debris. Among numerous architectural fragments, the richly decorated foot from a colossal marble statue was found. Between the Trajaneum and the Library an area was cleared and levelled to form a collecting ground for the planned architectural restoration (Radt 1975, 42).

1975: Conclusion of preliminary investigations and introduction of a reconstruction model that involved re-assembly of both temple gables and partial reconstruction of the halls and their roofs (Schmidt 1993, 173-174).

1976: Because of the great number of new material proposed to be utilised, the responsible committee of the German Archaeological Institute called for limitation of the works, reducing them to anastylosis (Nohlen 1985, 145; Schmidt 1993, 173-179).

1977: Restoration work began in April and lasted till September. The expedition house was completed. Two cisterns were cleaned out and large quantities of pottery were removed to the depot. Recording by drawing and photography continued (Radt 1978, 28-32).

The Vaulted Substructure: Vaults under the entrance stairway to the temple were completely cleared, as well as those under the temple to the north. The intervening row proved to lie very deep and was difficult to excavate. They had served as cisterns and their contents were muddy and damp, so that remains of ancient wooden beams were preserved and these were removed for scientific study (Radt 1978, 32).

Eastern Annex: A test trench was dug along the east wall. Under the Roman fill, Hellenistic walls were encountered, running diagonally to the direction of the temple (Radt 1978, 33).

1978: In Vault A the earth bulk on the east side was removed layer by layer. Also Vault C was largely excavated (Radt 1979, 210).

1980: Restoration work began in May and ended in September (Radt 1981, 201). The main emphasis was on reconstructing the supporting wall of the north portico, from which considerable parts existed (Schmidt 1993, 175), to the west of the central axis of the building. The blocks had to be systematically taken down, numbered and, after removal of fallen earth and rock, re-laid. The subsidence had been caused by a hollow in the rock connected with a previous building phase. The reconstructed wall was protected against earthquakes by ties of reinforced concrete (Radt 1981, 205). Columns in the north portico were rebuilt, capitals and architraves reinstated. Vaults and arches in the substructure were strengthened. Restoration of the facing wall of the Eastern Annex was completed. Restorations were carried out on the rear wall of the Eastern Portico (Radt 1981, 205; Schmidt 1993, 175-176). The apse of this portico was completed to its intended height; the staircase from the apse to the Northern Portico was raised in concrete. West of the Western Annex, a section of the citadel wall that was in a dangerous condition was strengthened. Furthermore, excavations were carried out in the Eastern Annex, in Vault A, and in the Western Annex (Radt 1981, 205).

1981: Restoration work began in May and ended in September. The excavations that were necessary for the progress of the restorations were concentrated on the Western Annex, Vault A, and the south end of the Eastern Colonnade (Radt 1982, 18-21).

An important find was that of a colossal marble statue of an armoured man in the Western Annex, with a base that probably belonged to it. The inscription on the base states that the person represented is the Emperor Hadrian (Radt 1982, 21).

In the restoration of the temple special care was devoted to the re-erection of the northern portico. Six more columns with their capitals, four architraves and three cornices were put up (Radt 1982, 21; Schmidt 1993, 176).

1982: Restorations and archaeological works lasted from May to October. Archaeological activities were closely related to the necessary safety measures, partly caused by the severe weather conditions. Behind the supporting wall of the north portico, earth pressure during the winter had caused part of the wall to move, and some andesite blocks had fallen into the courtyard. In order to be able to remove the resulting bulge structurally and to obtain a better dating for the ancient fill behind the portico, the back of the wall was cleared of earth. A trench was cut up the slope at right angles to the wall and down to the bedrock. Building work on the north wall of the so-called Red Hall revealed that to the north of this wall there was a channel for draining the water on the slope. Sounding in the northern part of Vault L revealed scanty traces of the diagonally oriented Hellenistic levels and a cutting in the rock for the original east wall of the Trajaneum. Another sounding was made in the southern part of the vault. In its medieval fill two pairs of overturned Doric capitals of good Hellenistic form were found, one upon the other. At a lower level, there were remains of a water tank made of mortar. Other soundings were carried out on the western side of the Trajaneum. At the Western Annex the objective was to clarify the underlying buildings. Documentation by drawing, architectural studies, replacing of fallen elements and safety measures were undertaken (Radt 1983, 257-258).

1983: Restorations and archaeological work began in May and ended in September. The small vaults C and D west of the temple foundations were excavated down to bedrock, and remains of earlier Hellenistic buildings running obliquely to the Trajaneum were found. At Vault C the north and east walls of a Hellenistic room were identified. The south wall had disappeared. To the south of the north wall lay many fragments of Hellenistic roof tiles. Further south the floor had been patched up with pieces of late Byzantine brick and stone. Debris of bone, mussels and signs of burning showed that the vault had been used in the 12^{th}-14^{th} centuries AD. By Vault D the north and west walls of a Hellenistic room were found, and again the south wall on the steep slope was missing. The water tanks found in the southern part of Vault L were Hellenistic, running obliquely to the temple. There were several plastered tanks side by side. Under them traces of an earlier building were observed. Preparations for publication were actively continued. Architectural elements were carefully studied, building blocks were measured and listed, all walls were surveyed and plotted, and dismembered fragments of architecture were either fitted together or were assigned to their correct positions with a view to future restoration. Further safety measures were carried out (Radt 1984, 230-231).

1984: The campaign began in May and ended in September (Radt 1985, 206).

Western Annex A further wall was uncovered that belongs to the building under the Trajaneum and runs up against the wall of the Empire period. It was connected with the Hellenistic structures better represented in vaults, west of the temples, which were excavated earlier and were finally clarified this year (Radt 1985, 208).

Vault C: The excavations of the previous year were extended to the south. The Hellenistic room, which was partly exposed last year, was completely excavated, including its south wall, and its connection with the walls of the next terrace to the south was clarified (Radt 1985, 209).

Vault M: The arched passage from Vault L eastwards into Vault M had become blocked with concrete as part of an earlier restoration plan. It was opened up to facilitate a sounding across the vault, which brought various results (Radt 1985, 209).

Sounding in the Stylobate of the East Portico: A sounding down to bedrock was made in the area of the stylobate of the East Portico and immediately west of it, in order to clarify the nature of the foundations and the perimeter wall of the fifth phase of the Trajaneum before the re-erection of the columns. The usual oblique walls of earlier buildings were found, and in the northern sector, a strong white-plastered terrace wall on the valley side and damp-proof space against the hillside. Under the paving of the courtyard a packing of stones and cement was founded on the bedrock and was intended to prevent the subsidence of the stylobate (Radt 1985, 209).

1985: Restoration works lasted from May to September. Digging took place in Vaults L and M for the purpose of final clarification of the findings, and a sounding became necessary to the north of the staircase of the Eastern Annex in preparation for the construction of an approach road from the East. Stratification was confirmed, and in the sounding walls running obliquely to the Trajaneum again came to light. These walls evidently continued eastwards in the direction of the Library of the Temple of Athena. The rest of the season was devoted to recording and reconstruction (Radt 1986, 208-210).

1986: Restoration work began in May and ended in September. Soundings and cleaning-up operations were carried out in Vaults A and B for the clarification of the antecedent Hellenistic buildings excavated in the 1960s. In Vault B workings in the rock were uncovered that looked as if they might belong to an extension of the wall encountered in the Western Annex. The rest of the season was mainly devoted to recording and restoration (Radt 1987, 211-214).

1987: Prior to construction of a tourist road to the vaults of the Trajaneum, the ground had to be tested archaeologically. West of Vault A, remains of two Hellenistic rooms were encountered. They were in a line with the vaults A-D and formed a direct continuation of them, with a total length of 40m. Another street seemed to have run south of them. North of the north wall of the Western Annex a length of wall with two doors was found (Radt 1988, 205).

1988: The Hellenistic structure encountered in 1987 northeast of the Eumenian wall was followed further to the northwest. The partly excavated casemate-like room was cleared and another similar one was found on the west side. Beyond this were further walls. There were signs that the most north-westerly room had been used as a workshop in Roman times. Protective operations and preparations for publication actively continued (Radt 1989 182).

APPENDIX E3. THE HELLENISTIC NYMPHAEUM AT SAGALASSOS

E3.1 Introduction

The ruins of Sagalassos, the most important city in Pisidia region during the Roman Imperial Period, are found north of Antalya in the Burdur province in Southern Turkey (Bisnir *et al.* 1993, 85; Bracke 1993, 15; Waelkens 1993b, 37).

E3.1.1 History of the site and the excavation expeditions

In 1706, Lucas discovered the ancient site (Bracke 1993, 16; Waelkens 1993b, 40; Waelkens and team 1997, 225). Description of the site and the first sketch of ruins were given in 1824 by Arundell (Waelkens 1993b, 40; Waelkens and team 1997, 225). In 1885, a team led by the Polish Count Lanckoronski studied the region and produced a full-scale survey. This remains an indispensable source book for knowledge of Pisidia, even though it deals with the most important buildings only. Other research was restricted to general descriptions of archaeological remains and single buildings (Bracke 1993, 16 and 40; Waelkens 1993b, 40; Waelkens and team 1997, 225-226). Smaller expeditions followed in the 20th century, Italian missions and Austrian teams visited and surveyed the site, focusing on particular monuments (Waelkens 1993b, 40; Waelkens and team 1997, 225). Topographic knowledge of the region remained vague and uncertain, due to the difficulty of accessing some places (Bracke 1993, 16).

In 1982 a team led by Mitchell, from the University College of Swansea, and Waelkens, from the Catholic University of Leuven, undertook the ‘Pisidia Project’ (Bracke 1993, 16; Waelkens 1993a, 9). The purpose was to compile a complete account of the archaeological remains and map all sites (Waelkens 1993a, 9; Waelkens 1993b, 40). The Sagalassos campaign initiated in 1986 conducting surveys for five years (Mitchell *et al.* 1989, 63; Waelkens 1993a, 9-10; Waelkens and team 1997, 226). Gradually, the Belgian participation became more important and eventually predominant, both financially and as far as participants were concerned (Waelkens 1993b, 40; Waelkens and team 1997, 226). The Turkish Council of Ministers and the Turkish Ministry of Culture granted full-scale excavation permit, henceforth making Sagalassos a Belgian excavation (Waelkens 1993a, 10). In the 1990s, large scale excavations started, directed by Waelkens and the Archaeological Museum of Burdur (Bracke 1993, 16; Waelkens 1993a, 10). Besides excavations in the city, the ultimate purpose developed into an interdisciplinary study of all material remains and research concerning the relationship of Sagalassos with its vast territory (Waelkens 2000a, 77). In 2000, only a small, although impressive part of the site had been uncovered and much remained to be done (Sagalassos Division 2004), although the monumental city centre has been exposed, an intensive urban and geophysical survey has been undertaken and four major restoration projects have been completed (Waelkens and Vereenooghe 2003).

Sagalassos is situated in the heartland of the Neolithic revolution (Waelkens 1993b, 41; Waelkens *et al.* 1997, 103). The first source is Arrian's description of the capture of Sagalassos by Alexander the Great in 334 BC (Waelkens 1993b, 41; Waelkens and team 1997, 225). The oldest preserved monuments are from the early Hellenistic Period (334-189 BC). Sagalassos was also exposed to Attalid influences (middle Hellenistic Period) (Bracke 1993, 25), while various monuments of the late Hellenistic Period were found too (Waelkens 1993b, 45). During the 2nd and 3rd century AD, the city had effectively become the 'first city of Pisidia' (Waelkens and team 1997, 226), as Roman rule meant stability and economic growth. Despite a possible temporary back-fall during the 1st century AD, perhaps as result of earthquakes or other catastrophes, the city regained its full strength and enjoyed its heyday, flourishing during the 4th century AD (Waelkens 1993b, 45-47).

An extensive urban conservation programme forms part of the annual excavation programme at Sagalassos, in order to preserve architectural remains irrespective of their size, function or date. This programme aims at keeping excavation results intact and contributes to the presentation of the site to the general public. Examples are the Roman Baths, the early Byzantine domestic Complex close to the Baths, the Western Portico of the Upper Agora, the Neon Library, the early Imperial Heroon, the Antonine Nymphaeum, and the Gateway with the monumental stairway (Sagalassos Project 2002).

E3.2 The Hellenistic Nymphaeum

E3.2.1 Introduction to the monument

E3.2.1.1 Description and history of the monument – building phases

The Nymphaeum was built against and partly set into a steep natural slope in the north-eastern part of the upper city of Sagalassos (Patricio 1996, 102- 103; Patricio and Van Balen 1993, 88; Waelkens 1993b, 44; Waelkens 1993c, 44; Waelkens *et al.* 1991, 197; Waelkens *et al.* 1992, 79; Waelkens *et al.* 1995, 47).

Although it is difficult to establish the date of the structure, the stratigraphy, the workmanship and details of the Doric order suggest a late Hellenistic or early Imperial date, around the middle of the 1st century AD (Patricio 1996, 102; Patricio and Van Balen 1993, 88; Waelkens 1993b, 44; Waelkens 1993c, 47; Waelkens and Owens 1994, 170; Waelkens *et al.* 1991, 203; Waelkens *et al.* 1995, 47), though archaeologists were able to distinguish among four different building phases. It is one of the first imperial Nymphaea with a U-shape, imposed by the hillside (Waelkens 1993b, 44; Waelkens 1993c, 47; Waelkens *et al.* 1991, 197). It represents a transition between the one-storied Doric order stoa-like Greek fountain houses and the two-storied U-shaped nymphaea, popular in Asia Minor in the Flavian period (Waelkens 1993c, 47).

It is rectangular and built of stone, with dimensions 10.90m wide and 7.33 m deep (Patricio 1996, 103; Patricio and Van Balen 1993, 88; Waelkens 1993b, 44; Waelkens *et al.* 1992, 81). It was originally composed of three Doric porticoes, along the west, north and east sides (Patricio *et al.* 2000, 400; Waelkens 1993c, 44), enclosing a courtyard. Each of the three wings contained two half-columns (Waelkens 1993b, 44; Waelkens *et al.* 1992, 81). The façade had eight Doric tall columns, of local white limestone (Waelkens 1993c, 44-46). Both corners of the entablature were treated plainly into an architrave and triglyph-and-metope frieze (Patricio and Van Balen 1995, 145; Patricio *et al.* 2000, 400; Waelkens 1993c, 43). The roof was constructed of large limestone slabs (Waelkens 1993c, 43). Each portico contained four supports, of which the middle ones were attached to a rectangular pillar (Waelkens 1993b, 44; Waelkens 1993c, 46; Waelkens *et al.* 1991, 197; Waelkens *et al.* 1992, 81). A layer of mortar covered the back wall and the parapets, in order to prevent water from disappearing through the joints (Waelkens 1993c, 45). Parapets and walls formed three water basins (Patricio *et al.* 2000, 400). The south wall of the side wings and the back wall of the drawing basin reinforced the structure (Waelkens *et al.* 1991, 198). Back walls were constructed of polygonal dry masonry (Waelkens 1993b, 44; Waelkens *et al.* 1992, 81). A window in the back wall of the central wing opened upon the natural spring (Waelkens 1993b, 44; Waelkens *et al.* 1991, 198).

Interesting details and techniques (Patricio and Van Balen 1995, 146) were found in stone blocks originally connected vertically by iron dowels and horizontally by iron cramps (Ercan *et al.* 1997, 423; Van Balen 2000, 213; Van Balen *et al.* 1999, 106); column drums and capitals were linked by iron dowels set in square blocks of lead (Patricio and Van Balen 1995, 146; Van Balen *et al.* 1999, 107; Van Balen 2000, 213; Waelkens 1993c, 46); architraves posed directly on capitals, interconnected with π-shaped rectangular lead-protected iron cramps (Patricio and Van Balen 1995, 146; Van Balen 2000, 213; Van Balen *et al.* 1999, 107).

In the first building phase the monument is as we know it (Waelkens 1993c, 44-47). In the second building phase the west portico was repaired and the south wall was constructed (Waelkens 1993c, 47-50; Waelkens and Owens 1994, 170; Waelkens *et al.* 1995, 47; Waelkens *et al.* 2000, 324). A new wall, built over the original courtyard pavement, closed the fountain courtyard towards the south. From this time onwards, a stairway built against the central part of this enclosing wall gave access to the fountain. Stratigraphical analysis dated these changes in the 2nd century AD (Waelkens and Owens 1994, 170; Waelkens *et al.* 1995, 47; Waelkens *et al.* 2000, 324), perhaps when the Neon Library was built immediately behind the fountain. These changes extended along the north side and next to the ‘service room’. The fountain was accessible by a stairway (Waelkens *et al.* 2000, 324).

In the third building phase, near the beginning of the 3rd century AD (Waelkens *et al.* 1995, 51), a paved square was arranged around it (Waelkens 1993c, 50-52; Waelkens *et al.* 1997, 113). Urban transformation of the area – maybe because the street running behind and even partly above it, connecting the upper agora with the theatre, increasingly became one of the most monumental thoroughfares of the city – may have also included construction of a peristyle building in the south (Waelkens and Owens 1994, 170; Waelkens *et al.* 1995, 48-50). Layers of a massive fill on either side of the fountain can be distinguished behind the massive southern terrace wall, which kept the fill in place when the original slopes in the east and west were levelled to pave the street and esplanade (Waelkens *et al.* 1995, 47-48). Its southern part was the back wall of a large peristyle building (Waelkens *et al.* 1995, 51).

In the fourth building phase the fountain house was transformed into water reservoir (Waelkens 1993c, 53-54), feeding three water supply systems made of terracotta pipes. Probably most aqueducts of the city were destroyed in the first half of the 6th century AD, as a consequence of the earthquakes in 518 and 528 AD. As a result, the Nymphaeum was no longer used as a public fountain: three holes were cut through the back wall of the north portico, so that the water within could be directly transported by the three terracotta pipes to well-chosen spots within the city. These water-supply systems were partially supported by a wall made of re-used stones inside the north basin and the courtyard, while a deep earth fill thrown inside the basin and the courtyard formed at the same time a support and a protective cover (Waelkens *et al.* 1995, 47; Waelkens *et al.* 1997, 112; Waelkens *et al.* 2000, 329). That was around the first half of the 6th century AD. From this time onwards, these systems distributed water directly towards the city (Waelkens and Owens 1994, 171; Waelkens *et al.* 1995, 50).

Regarding the function of the nymphaeum, originally, the water was flowing into the drawing basin through a horizontal slit in the middle of the central back wall. Later, this opening was replaced by three irregular holes cut to receive terracotta pipes, arranged on top of rough walls placed within the original drawing basin and inside the courtyard. They belonged to a system, which captured the water of the source behind the back wall of the central portico and delivered it directly to various points within the city. Consequently, the fountain house ceased to function as a Nymphaeum and became a kind of closed water reservoir instead. During its ultimate phase, the courtyard had been flooded and became an open-air water basin (Waelkens *et al.* 1992, 82).

E3.2.1.2 History of excavations and interventions

The Nymphaeum was excavated during 1990 and 1991 (Waelkens 1993b, 44; Waelkens *et al.* 1995, 47), immediately selected since its shape identified it as a fountain house (Waelkens 1993c, 43), almost totally buried with only part of it showing above ground. Excavation revealed a fountain with a natural spring (Patricio and Van Balen 1993, 88). Removal of blocks and collapsed parts resulted in clearing the interior courtyard (Waelkens 1993c, 43; Waelkens *et al.* 1992, 79). The roof and entablature of the eastern half of north portico were taken away for restoration. Further excavations were undertaken around the fountain, before and during its restoration (Waelkens 1993c, 43; Waelkens 2000b, 10; Waelkens *et al.* 1995, 47). Dismantling of the western portico and stairway preceded it. By 1997 the late Hellenistic fountain house was restored to its original function (Waelkens 2000b, 10).

The disciplines that collaborated in the research and anastylosis of the monument, apart from archaeology and architecture, were geology, cartography, anthropology, ancient history, architectural restoration, illustration, geomorphology, archaeozoology, conservation, and photography, together with computer technology (Martens *et al.* 2000, 205; Sagalassos Project 2002; Waelkens 1993a, 10; Waelkens *et al.* 1992, 79; Waelkens 2000a, 7; Waelkens and Owens 1994, 169). Lately, further scientific research topics became virtual archaeology, ceramics analysis, palaeobotany, agro-engineering, and genetic research (Sagalassos Project 2002). The Sagalassos campaign became an interdisciplinary research project, during which archaeological evidence would be interpreted and tested against data from other sources (Martens *et al.* 2000, 205; Sagalassos Division 2004; Waelkens and team 1997, 226). Presence of specialists from various disciplines prevents the risk of multidisciplinary approaches, according to which disciplines work ‘next to one another’ without necessarily linking their results. Their approaches are interdisciplinary, as disciplines collaborate to produce answers to questions formulated in common (Waelkens and team 1997, 227).

Scholars come from various countries (Waelkens 1993b, 41), including specialists from the Universities of Swansea, Belgium, and the U.K., and involvement of Turkish experts, together with locals and workmen (Waelkens 1993a, 9-10). In its duration, the campaign was funded by various British, Italian, Belgian, and Flemish governmental and research archaeological institutes and universities, organisations and private companies, and the 'Friends of Sagalassos' association (Mitchell 1989, 63; Patricio and Van Balen 1993, 90-91; Patricio and Van Balen 1995, 147; Van Balen and Patricio 1995, 167; Waelkens 1993a, 9-10; Waelkens 2000a, 9; Waelkens 2000b, 185; Waelkens and Owens 1994, 169; Waelkens *et al.* 1991, 197; Waelkens *et al.* 1992, 79). The DAB Ludwig Boltzmann Institute and the Juntal Nacional de Ivestigacao Cientifica e Techologica, Lisbon provided a valuable grant, which made the restoration study and architectural research possible (Ercan *et al.* 1997, 436-437; Patricio *et al.* 2000, 417).

E3.2.2.3 State of preservation

The Nymphaeum remains were found relatively well preserved (Patricio and Van Balen 1995, 143; Waelkens 1993c, 43; Waelkens *et al.* 1991, 197). Before excavation, only part of the entablature and the front of the north portico were visible above ground (Patricio 1996, 103; Patricio and Van Balen 1993, 88; Waelkens 1993c, 43; Waelkens *et al.* 1991, 197). Most elements were present around the building (Patricio 1996, 103; Patricio and Van Balen 1993, 88). Yet, an enormous quantity of elements, both blocks and fragments, were found beyond their original location and settled in successive levels (Patricio and Van Balen 1993, 88). Because seismic activities and deterioration processes over the centuries had caused collapse of the structure, after being artificially buried, most building blocks were found fragmented in pieces, with serious cracks, and with missing fragments (Patricio 1996, 103; Patricio *et al.* 2000, 400; Patricio and Van Balen 1993, 88).

Along the north edge, some large slabs from the esplanade pavement in front of the library, probably from the 3rd century AD, were still *in situ*, but elsewhere most of the pavement had disappeared (Waelkens *et al.* 1995, 48). The huge limestone slabs were still supporting the eastern extremity of the central part but had partly collapsed in the western half (Waelkens *et al.* 1991, 198; Waelkens *et al.* 1992, 79). Three cornice blocks were missing: one from the central part of the north portico, and two from the south part of the east and west porticoes (Patricio *et al.* 2000, 400). The roof system seemed to be *in situ* in the eastern extremity of this wing, whereas its western half had collapsed towards the centre. The position of the entablature and roof slabs (some broken in several places) indicated that this had happened when most of the building had already been buried beneath a thick erosion layer. In the west and east wings, only the back walls were still standing, but the porticoes had collapsed too (Waelkens 1993c, 43; Waelkens *et al.* 1991, 198 and 203; Waelkens *et al.* 1992, 79). Architectural investigation of the fountain revealed that some complete stone members from the original structure were missing, e.g. blocks from the south and west wall, steps from the entrance stair, and three cornices and capitals (Patricio *et al.* 2000, 408).

Regarding the movement suffered by the structure, earthquake forces induced it in south-west/north-east directions. This resulted in total collapse of the west and east porticoes and partial destruction of the west wall. It induced a strong tilt in the east wall with the consequent slipping of the foundations of the east and west porticoes (Patricio *et al.* 2000, 416).

The remote location of the site did not invoke systematic dismantling of its monuments for building materials. Other disturbances were prevented by rapid burial of urban remains under extensive erosion deposits, which obscured the ruins from sight and protected them (Patricio and Van Balen 1993, 88; Sagalassos Project 2002).

The 448 stones removed from the ruin were sorted out into families: 46 column and capital pieces, 22 architrave pieces, 48 cornice pieces, 50 wall stones, 35 pavement slabs, and 247 stone fragments of miscellaneous origin (Patricio *et al.* 1993, 88).

E3.2.2 Theory behind the anastylosis proposal for the Nymphaeum

E3.2.2.1 Reasons and aims of the anastylosis

As unknown ancient sites in the interior of Turkey have acquired a new interest (Bracke 1993, 15), Sagalassos, located close to the well-known port and holiday resort Antalya, has become part of most *cultural tours* and a favourite day excursion. Furthermore, the site provides a unique possibility for archaeologists to examine an ancient city and its territory. This is why restoration projects are necessary to archaeological research (Sagalassos Project 2002).

Excavations of the fountain fitted into the aim of studying the water supply of the city in greater detail (Waelkens 1993c, 43). Ability of reusing the original system and filling the basins with water would permit reinstatement of the original function of the building as a fountain, a unique achievement in classical archaeology (Patricio *et al.* 2000, 399; Sagalassos Project 2002). Moreover, it was considered that, unlike other archaeological finds, architectural objects by their very nature need to be preserved and restored *in situ* (Patricio 1996, 101; Patricio and Van Balen 1993, 87).

Starting point for anastylosis is considered the restoration of a stone structure that at the time of discovery is totally or partially dismembered, as was the Nymphaeum. Anastylosis was possible as most constituent elements are preserved, allowing allocation of each element to its original position with its own structural role (Patricio and Van Balen 1993, 87-88; Patricio *et al.* 2000, 399). Hence, the proposed anastylosis aimed at re-erecting the dismembered structure with its original elements and preserving its original structural behaviour (Ercan *et al.* 1997, 423; Patricio *et al.* 2000, 399; Van Balen *et al.* 1999, 106). The restorers of the Nymphaeum see anastylosis, as integral part of historic investigation that leads to understanding the original building (Patricio and Van Balen 1993, 87-88). Hence, research on the monument before its reinstatement provided a unique opportunity to analyse and develop scientific knowledge on its architecture. It also reveals information about building techniques and helps understand the initial concept of its architect and those who intervened over time (Patricio and Van Balen 1993, 90; Patricio *et al.* 2000, 90).

Apart from forming the first step in preserving historical information, restoration improved the structural behaviour of the building to a certain extent, but did not intend to protect it against severe earthquakes (Ercan *et al.* 1997, 423-424; Patricio *et al.* 2000, 399-408; Van Balen 2000, 214-215; Van Balen *et al.* 1999, 108-109).

E3.2.2.2 Principles and theoretical framework of the works

The theory embracing anastylosis of the Nymphaeum is resumed by the principle that anastylosis should not be considered as a specific theory, but as similar to any other restoration, and it should correspond to fundamental principles generally valid for restoration. Restoration, besides aiming at preservation, must also deal with problems such as collecting and processing information, technical difficulties, and aesthetic matters. Its aspects cannot be fitted into rigid classifications, but must be studied individually, initiating with the survival of the monument in time (Patricio 1996, 101-102; Patricio and Van Balen 1993, 87).

The concept of anastylosis was considered as based on comprehensive technological research, weighted considerations, and the drawing up of criteria for technical and methodological actions. The starting point for work is the monument itself and the preservation of most of its constituent elements, which should be able to regain their structural role (Patricio 1996, 102 and 108; Patricio and Van Balen 1993, 87). A methodology for restoration should therefore be designed, so that all interventions would be consistent within it (Ercan *et al.* 1997, 423). For elaboration of a full architectural study, guidelines needed to be established to correctly and conclusively interpret the historiography of the monument, reconciling scientific objectives with the need to inform the public (Patricio 1996, 101; Patricio and Van Balen 1993, 87).

In restoring the Nymphaeum, it was important to have complete understanding of the ruin, including its construction methods, the context in which elements were found, their position when found, their relationship to one another, and their state of preservation (Ercan *et al.* 1997, 423; Patricio 1996, 101; Patricio and Van Balen 1993, 8;). Therefore, according to current practices and principles of architectural restoration, the exact position of each building part had to be recorded, and the intervention techniques had to be based on an accepted scientific methodology (Van Balen 2000, 212; Van Balen *et al.* 1999, 106).

Assessment of the values of the available material should be made in order to gain awareness of its historic and aesthetic values. Detailed and accurate drawings for setting up the anastylosis uncovered aesthetic, formal and historical values, as well as information about the mechanical behaviour of the structure and how the building deteriorated or collapsed (Patricio 1996, 107; Patricio and Van Balen 1993, 89).

The most general principles declared that materials and techniques employed should not have adverse effects on the building and that intervention should be the minimum to satisfy structural purposes. The principle of minimum intervention is a fundamental aspect in the anastylosis philosophy, meaning that all works should strictly guarantee proper use, conservation and prolongation of the *life* of the original fabric. Original material and construction system should be preserved (Ercan *et al.* 1997, 423-424; Patricio *et al.* 2000, 400 and 408; Van Balen 2000, 213-215; Van Balen *et al.* 1999, 106-109), as form, structure, and construction technique are fundamental characteristics of stone structures and an anastylosis project must consider them (Patricio and Van Balen 1995, 146).

From the generally accepted *Venice Charter* and current discussions on conservation and restoration of historic buildings, some principles had to be taken into account, encapsulating notions of authenticity, reversibility, compatibility and retreatability. Authenticity of an excavated structure should be seen as different 'layers' of significance. Apart from *authenticity* of surviving building materials, the original structural system also represents a *state of understanding* of construction. Structural restoration should respect the system of the original construction, as this forms integral part of its authenticity and historic value (Ercan *et al.* 1997, 423-424; Van Balen 2000, 214-215; Van Balen *et al.* 1999, 108-109).

Reversibility is related to heritage conservation but is harder to achieve in building conservation. In the Nymphaeum, research led to application of criteria, such as compatibility and retreatability, developed at the Dahlem Conference in Berlin in 1997. Compatibility entails that treatment materials will not have negative consequences and retreatability means that conservation would not preclude or impede future treatments (Van Balen 2000, 211-215; Van Balen *et al.* 1999, 109).

E3.2.3 The anastylosis programme of the Nymphaeum

E3.2.3.1 The general strategy followed

According to the interdisciplinary approach, various studies were undertaken to investigate diverse topics on the site. A hydrographical study investigated if the site or its surroundings provided enough water to serve a fair-sized population (Waelkens 1993b, 38), while a geomorphological study revealed information on the function of the fountain (Waelkens *et al.* 1992, 81-82). Archaeometric studies explored the ancient mortars in view of their conservation and composition of new protective ones. Mortars had disintegrated due to the wet burial circumstances or weathered rapidly after exposed by excavation. Concern over authenticity, loss of traditional know-how, experience in mortar preparation and application, and importance of compatibility between new and original material instigated research with a view to composition of appropriate repair mortar (Degryse 2002, 1457-1458; Viaene *et al.* 1997, 406).

A study of the building stones aimed at finding out whether local limestones were used and at delineating their petrographical, geochemical and physical features, which would be used to select suitable limestone to restore the building (Bisnir *et al.* 1993, 85-87). Preliminary tests on small stone samples revealed variations in quality and, thus, in mechanical strength (Van Balen 2000, 213; Van Balen *et al.* 1999, 107). Investigation on the structural behaviour, building construction methods and techniques continued throughout the campaigns. The study of construction elements afforded important conclusions for the reconstitution of the original building (Patricio *et al.* 2000, 399; Van Balen 2000, 213-214; Van Balen *et al.* 1999, 107-108).

Further excavations, before planning the anastylosis, were conducted in large sections on the fountain house, providing valuable information about its complicated building history and various transformations (Waelkens 1993c, 43-44). Archaeological excavations enabled the definition of the historical context and the position of architectural elements (Patricio and Van Balen 1993, 89), the understanding of the structure, the preparation of anastylosis (Waelkens *et al.* 1995, 47), and determination of the water supply system (Waelkens *et al.* 1997, 110).

Minor preparatory work contributed to better handling various technical aspects of the works, such as cleaning of the monument and its surroundings, preparation of working zones close to the monuments, and gathering of any possible information (Patricio 1996, 104; Patricio and Van Balen 1993, 88-89).

An international team is developing 3D multimedia tools to measure, reconstruct and visualise archaeological urban landscapes, monuments and artefacts in virtual reality, using as a test case the ancient town of Sagalassos (Cosmas *et al.* 2001, 1; Cosmas *et al.* 2002, 1; Pollefeys 2001; Sagalassos Project 2002; Van Gool *et al.* 2002, 53; 3D Murale 2003). Virtual reality is a technology that offers promising perspectives for archaeologists (Pollefeys *et al.* 2000, 71). The goals of the project are to provide tools that will produce accurate and visually convincing results both for guiding ongoing conservation and anastylosis efforts and for presenting archaeological materials and sites to a wider audience of non-specialists (Cosmas *et al.* 2002, 1; Van Gool *et al.* 2002, 55; 3D Murale 2003). Among the possibilities offered are techniques developed to allow virtual and possibly subsequently physical completion or anastylosis of artefacts or buildings (Cosmas *et al.* 2001, 2; Cosmas *et al.* 2002, 1; 3D Murale 2003). Reconstruction is done in steps, which include the existing building blocks being completed, hypothetical blocks being assembled like 3D puzzle elements to reconstruct the original building, and missing parts being added by creating additional hypothetical objects (3D Murale 2003). Among these new possibilities, an interesting example is matching parts for virtual restoration and anastylosis, possibly as a first step towards physical restoration (Van Gool *et al.* 2002, 54). This offers a flexible method to test building hypotheses without the problems of manipulating the real building blocks (Pollefeys *et al.* 2000, 77).

In order to identify pieces originating from the same block and for such a comparative study, all blocks and fragments were first sorted out into large typological families (Patricio 1996, 104-106; Patricio and Van Balen 1995, 143). A first model was established from the part of the building, which remained in situ with its constituent elements practically still intact (Patricio 1996, 103; Patricio and Van Balen 1993, 88). As many elements were found beyond the original location and settled in successive levels, the first phase of reconstitution could be carried out with relative accuracy as far as dimensions and scale were concerned (Patricio and Van Balen 1993, 88).

Extensive surveying of ruins and their components was one of the longer and more extended methods of information gathering in the whole restoration process and a fundamental aspect of the anastylosis. The various surveys, whether topographic, graphic, photographic or written, were carried out in a systematic manner to avoid drawing premature conclusions. They referred to all elements found in situ, the position and location of fallen blocks, their context, and their relationship with one another. The data is copied into files kept for each individual stone (Patricio 1996, 104; Patricio and Van Balen 1993, 88-89).

Once the overall graphic survey of the ruins was completed and the various forms, typologies, characteristics and traces of the blocks were identified, referenced, and studied, it was possible to carry out partial anastylosis. The connections between various fragments and blocks were confirmed by experimental joining. Conclusions derived from partial anastylosis of fragments and blocks were recorded in drawings, which improved understanding of the structure and provided the first approximate measurements, to be featured on the first graphic synthesis (Patricio 1996, 103-106; Patricio and Van Balen 1993, 88-90; Patricio and Van Balen 1995, 143). It was decided to work with three-dimensional (test) models on an 1:1 scale built with the original and restored material itself (Patricio *et al.* 2000, 416). When conclusions could be drawn concerning the correct position of a block, this was immediately indicated in models constructed to represent the formal composition of the building. By following this method, the possibility of error was minimised without loss of information while the correct form and proportions of the building gradually took shape (Patricio 1996, 104-107; Patricio and Van Balen 1993, 88-90; Patricio and Van Balen 1995, 143-145; Patricio *et al.* 2000, 416). During the partial anastylosis fragments, which made up one block were discovered and were immediately cleaned and glued (Patricio 1996, 106-107; Patricio *et al.* 2000, 416).

Materials and techniques used for gluing and completing stone fragments were chosen based on the retreatability principle, leaving aside the generally accepted use of ductile materials for reinforcement (Van Balen 2000, 213; Van Balen *et al.* 1999, 105-106). The structure of the Nymphaeum consists of stone blocks originally connected vertically by dowels and horizontally by cramps (Ercan *et al.* 1997, 423). For the reinstatement, the broken stone blocks had to be joined and missing parts completed (only as far as necessary to satisfy the structural continuity) to make the original block, and, then the treated blocks had to be re-assembled on the structure with the aid of horizontal and vertical connections (Ercan *et al.* 1997, 423; Patricio *et al.* 2000, 408; Van Balen 2000, 213; Van Balen *et al.* 1999, 106).

Missing parts were completed for structural reasons using material with physical and mechanical properties similar to the original stone. Completion of stone blocks by epoxy mortar is an expensive solution, and when the missing part was too big, other solutions were sought (Ercan *et al.* 1997, 427-428; Van Balen *et al.* 1999, 113). Missing blocks were only replaced by new elements when strictly necessary for positioning existing ones. Natural stone was used as it is not expensive in Turkey, its long-term durability is known, is highly compatible from aesthetic and structural points of view, and its carving took into account traditional tools and craftsmanship. The final surface carving was integrated into the ancient one to guarantee satisfactory aesthetic results without violating the principle of differentiation among new and original elements (Patricio *et al.* 2000, 408-409).

For reasons of structural consolidation, broken fragments had to be joined together and where parts of blocks were missing they were completed (Patricio *et al.* 2000, 400), with the aim of preserving the original unity of the stones and provide abutment against possible horizontal forces and earthquake resistance (Van Balen and Patricio 1995, 166). That was achieved by pinning fibreglass rods, anchored by epoxy grout through cracks (Patricio *et al.* 2000, 408; Van Balen and Patricio 1995, 166). The laboratory tests measured the mechanical characteristic of the stones and the structure and the properties of epoxy glues and fibreglass (Ercan *et al.* 1997, 423-424; Patricio and Van Balen 1993, 90; Van Balen and Patricio 1995, 165; Van Balen *et al.* 1999, 111). The fibreglass-epoxy system combines the advantages of both materials while laboratory tests improved the performance of the system (Ercan *et al.* 1997, 423-424; Van Balen 2000, 217; Van Balen *et al.* 1999, 110). Hence, for joining structurally important broken blocks, fibreglass rods were used together with the epoxy adhesive (Patricio *et al.* 2000, 400). Fissured and flaking stone blocks of no structural importance were consolidated in situ by injection of water-porous glue, then sealed with a covering mortar (Ercan *et al.* 1997, 436; Patricio *et al.* 2000, 400 and 408; Van Balen 2000, 217). All restored blocks were cleaned by cold water under pressure. A chemical cleaning method, tested earlier in the laboratory, was applied to biological dirt deposits that did not come off with water (Patricio and Van Balen 1993, 90; Patricio *et al.* 2000, 408; Van Balen and Patricio 1995, 165).

Different connections should not be too strong, the criterion being the limit of strength of the stone. Damage to the original material due to high stresses induced by an earthquake, would be reduced. Its impact on the structure will be exhausted in breaking connections and moving blocks, instead of crushing the original stone because of too rigid connections (Ercan *et al.* 1997, 424; Van Balen 2000, 214).

Safety measures were taken since the work was relatively hazardous for both workers and visitors. Continuous maintenance work of the area was undertaken and whenever necessary, the ruins were covered for protection and temporary conservation measures were taken. An important problem was the seasonal contact with the site (Patricio 1996, 104-108; Patricio and Van Balen 1993, 89-90).

E3.2.3.2 The anastylosis programme of the monument

The first phase of the anastylosis included gathering information and preparing discovered material for further restoration, as well as producing the theoretical reconstitution model. The second phase led to partial anastylosis of some parts of the building together with smaller fragments (Patricio 1996, 106; Patricio and Van Balen 1995, 143; Patricio *et al.* 2000, 399). Preliminary study of the architectural elements permitted the first laboratory experiments and tests and a detailed study by direct observation (Patricio and Van Balen 1995, 143; Patricio *et al.* 2000, 399). The third phase started with restoration of damaged building blocks. Restoration of stone blocks was divided into four main activities: joining broken parts, completing missing parts, consolidation and cleaning of blocks. The last phase of the work began with placing the restored blocks started into position. Research continued until all blocks were re-assembled in the building (Patricio *et al.* 2000, 399-400).

The anastylosis project included: positioning of existing architectural elements without insertion of new ones; positioning of architraves of the three porticoes and the cornices of the north and east portico, integrating some completely new elements; positioning of the cornices of the west portico; and completing the west wall with new stone blocks to serve as support. Additionally, it was essential to correct the deformation of the foundations. The basins, parapets, and steps from the west and east side porticoes were dismantled and the foundation level corrected. Then everything was replaced and strengthened. As the natural water spring still existed, a plan to recover the original function of the building as a fountain by canalising the water flow into the basins of the fountain house was carried out (Patricio *et al.* 2000, 408-409 and 416-417).

E3.2.3.3 Surveys of the ruins - Structural consolidation and steps to be completed

The following surveys took place. A graphic survey of the fragments began together with the excavations, starting with removal of fallen blocks, and was applied to the totality of each block. It included sketching of faces, drawings of details, recording of minor observations, taking measurements and reproducing an accurate and comprehensive collection of traces. The graphic survey of blocks is of uttermost importance to understand the position of the block in the building or its history and preserve the historic document (Patricio 1996, 105; Patricio and Van Balen 1993, 89).

A graphic survey of the ruins followed so as to inform about the life of the building as a structure with an original shape, later changes of use, form or function, how the elements behaved, the existing deformations, and correct the position of the elements. A photographic survey together with drawings was carried out to complement the information supplied by the sketches. The photographs were taken from various angles and points of view in order to visualise the relationships between various blocks more effectively (Patricio 1996, 105; Patricio and Van Balen 1993, 90).

During excavations, the various blocks and fragments were grouped by species, typology and characteristics. These elements were assigned a serial number. This reference, which will be maintained until each element has received its final position in the building, is applied to all blocks and fragments, including even the smallest ones (Patricio 1996, 105-106; Patricio and Van Balen 1993, 90; Patricio and Van Balen 1995, 154). However, whenever there were doubts about the typological family to which an element belonged, especially in the case of small fragments, it was preferable not to draw any hasty conclusions (Patricio and Van Balen 1993, 90).

Such thorough surveys are fundamental if the building has collapsed due to seismic activities. They provide not only information of historical importance, but also technical information, such as how the building deteriorated or collapsed and what the mechanical behaviour of the structure was (Patricio and Van Balen 1993, 89).

The structural consolidation of the Nymphaeum was completed in stages:

a. Completion of missing parts

Missing parts were completed for structural reasons using material with physical and mechanical properties similar to the original stone. Tests had showed that it was possible to obtain an epoxy mortar with similar characteristics to the stone. The stone samples were prepared, after completing their missing parts with epoxy mortar. Then they were tested under compression and bending. Completion of stone blocks by epoxy mortar is an expensive solution, and when the missing part was too big, other solutions were sought (Ercan *et al.* 1997, 427-428; Van Balen *et al.* 1999, 113).

Following the principle of minimum intervention, the missing blocks were only replaced by new elements when it was strictly necessary for positioning an existing one. For replacement of missing blocks, two problems arose: the determination of the shape and dimensions of the missing stone blocks and the choice of the material to produce them. As sufficient information was available from studying the existing architectural material, the definition of shape, dimensions and proportions was not a difficult task to accomplish. However, the choice of the material was more complicated. A material with physical and mechanical properties similar to the original structural parts was sought. The use of pre-cast concrete was out of question, because cements in Turkey have a very high salt content, which could cause future problems to the structure. It was decided to prepare new blocks by carving natural stone. This material is not expensive in Turkey, cannot harm the building, its long-term durability is known and it is highly compatible with the original material from an aesthetic and structural point of view. Furthermore, as concern for preservation of authenticity tends to take into account craftsmanship, this solution was reinforced. After making an investigation to find a similar stone to the limestone used in the original elements and after evaluating its geological properties, it was decided to use limestone from a quarry near the city of Burdur. The stones were carved on site using traditional tools. Small fragments, belonging to missing capitals, were found and it was decided to integrate all the capital fragments found into the new carved ones. To improve aesthetic integration, the final shades and decoration of the new carved stones matched the integrated original fragments. They were further finished when the new stone blocks were in their final position on the structure. The carving of the final surface was integrated into the ancient one to guarantee more satisfactory aesthetic results, without violating the principle of differentiation among new and original elements (Patricio *et al.* 2000, 408-409).

b. Structural consolidation

The first problem to solve for the re-erection of the building was to make up sound blocks, as strong as they had been originally. Broken fragments had to be joined together and where parts of the blocks were missing they needed to be completed for structural integrity (Patricio *et al.* 2000, 400). Any structural consolidation must preserve the original unity of the stones and provide abutment against the possible horizontal forces. Earthquake resistance would be improved mainly by strengthening these connections, for the structure is unlikely to collapse so long as horizontal thrust is maintained and the abutments do not spread (Van Balen and Patricio 1995, 166).

Structural consolidation was necessary for blocks of structural importance that had severe cracks. Inspection and sound testing detected the cracks, and then structural consolidation was undertaken where necessary by pinning fibreglass rods, anchored by an epoxy grout through the cracks. The fissured and flaking stone blocks of no structural importance were consolidated *in situ* by injection of water-porous glue. Afterwards, all the fissures and cracks were sealed with a covering mortar, to avoid water seeping in, which could cause further frost damage (Patricio *et al.* 2000, 408).

c. Technical joining

In an ancient building used as a site to visit, safety requirements are different from those required for a contemporary building. The scale of building plays an important role, and the risk that a piece of the structure would fall on a visitor is low. Therefore, no reinforcements would be necessary to guarantee enough safety to the visitors. This approach informed the techniques of intervention: reconnect stone elements together to allow the connection to break before the stone, install dowels to resist stresses between the column drums and cramps to resist horizontal tensions stresses between the other stones (Van Balen 2000, 215-216; Van Balen *et al.* 1999, 109).

From the structural studies, it became clear that the contact areas subjected to compression stresses between stones should be restored by filling in the missing fragments and that the different connections should function properly (Van Balen 2000, 214) and not be too strong, the criterion being the limit of strength of the stone (Ercan *et al.* 1997, 424). Damage to the original material due to high stresses induced by an earthquake, could be reduced (Van Balen 2000, 214), as its impact on the structure will be exhausted in breaking the connections and moving the blocks, instead of crushing the original stone because of too rigid connections. In the worst case, the blocks would fall one by one (Ercan *et al.* 1997, 424).

More tests were conducted to study the most appropriate techniques for cleaning the stones and gluing the fragments (Patricio and Van Balen 1993, 90; Van Balen and Patricio 1995, 165). Restored blocks were cleaned by cold water under pressure. A chemical cleaning method was applied to the biological dirt deposits. The cleaning product, which does not leave or generate harmful salts on the stone, was tested in the laboratory (Patricio and Van Balen 1993, 90; Patricio *et al.* 2000, 408). The final cleaning was done after putting the blocks in place (Patricio *et al.* 2000, 408).

The laboratory tests measured the mechanical characteristic of the stones and the structure and the properties of epoxy glues (Patricio and Van Balen 1993, 90; Van Balen and Patricio 1995, 165). For obvious reasons, it was not possible to test the actual stones used in ancient buildings, and as a result, building stones were taken from ancient quarries in the vicinity of the city. The tests showed that the stone is much weaker than the values suggested by the previously mentioned geological study. That was due to difference in interpretations, as the geologists aimed at determining the type of stone in question and engineers and architects had to predict the mechanical behaviour of building elements. The mechanical tests showed widely differing values for tensile strengths while a second series of tests confirmed the significance of irregularities within the stone. The broken samples were glued back together using an epoxy resin containing fibres and again subjected to direct tensile stress, after which the samples broke elsewhere at the next weaker irregularity. This means that the glue was always stronger than the original material. In the Nymphaeum, this led to some interesting conclusions about the planning of the building and the techniques to be used in restoring it. The failure mechanism – breaking of stones – might have originated with the high stresses induced by one of the earthquakes to which Sagalassos is prone. The structure collapsed at some point, and the exact mechanism is still unknown (Van Balen and Patricio 1995, 165-167).

For joining the structurally important broken blocks, such as column drums, architraves and cornices, fibreglass rods were used together with the epoxy adhesive (Patricio *et al.* 2000, 400). Epoxy based adhesives and mortars are widely used in the restoration field, as they have high mechanical strength, very little shrinkage and excellent adhesion to stone (Ercan *et al.* 1997, 423). An epoxy-based adhesive mixed with limestone powder filler was used to glue small fragments, so the strength of adhesion and cohesion was reduced to almost the strength of the stone (Ercan *et al.* 1997, 436; Patricio *et al.* 2000, 400 and 408; Van Balen 2000, 217). The epoxy mortar, which was tested earlier in the laboratory, has similar physical properties to original stone, mechanical properties slightly weaker and a more elastic behaviour. According to the volume to fill and the structural function of the block, fibreglass bars were used for a stronger bond between the epoxy mortar and the stone blocks. As epoxy mortars discolour under ultraviolet radiation and in order to create a proper surface texture, a quick setting and non-shrinking thick covering mortar with a very similar colour to the stone, was applied over the dried epoxy mortar fillings (Patricio *et al.* 2000, 408). Although epoxy-based adhesives have high mechanical strength and perform very well in gluing the broken stones together, the use of epoxy resin alone may be unsafe according to weight, size and structural function of the glued stone. Reinforcements had to be used together with the epoxy adhesive in joining broken stone blocks subject to tensile stress (Ercan *et al.* 1997, 424; Van Balen *et al.* 1999, 111). Tests on joining elements were done in three parts: gluing, anchoring and joining by application of both gluing and anchoring (Ercan *et al.* 1997, 424). These tests proved that, with the fibreglass-epoxy system, it is possible to join broken members without exceeding the limit state strength of the stone, while adding limited ductility (Ercan *et al.* 1997, 427; Van Balen 2000, 217; Van Balen *et al.* 1999, 113).

Fibreglass (glass-fibre reinforced polyester rods) was investigated as a cheaper, strong and corrosion-free anchoring material (Ercan *et al.* 1997, 423). Its brittle nature was an advantage, as it meant that the reconstruction could be altered at any time in the future, as the broken reinforcement could be removed and replaced by a similar system (Patricio *et al.* 2000, 400). Fibreglass is increasingly being used as substitute for steel in modern reinforced concrete constructions (Ercan *et al.* 1997, 423). In restoration of classical architecture, stainless steel or titanium is often used as reinforcement and for anchoring. Those materials have the necessary resistance against corrosion and have a considerable mechanical strength. The disadvantage is that when subjected to high loads the reinforcement can deform and remain as such in the structure, hindering the next repair, thus reducing the retreatability (Ercan *et al.* 1997, 423; Van Balen 2000, 216-217; Van Balen *et al.* 1999, 110).

The fibreglass-epoxy system combines the advantages of both materials: fibreglass and epoxy resin. The conformity of the fibreglass-epoxy system to the structural restoration policy of the Nymphaeum was born out by the laboratory tests which also improved the performance of the system in joining, connecting and integrating the stone elements (Ercan *et al.* 1997, 423-424; Van Balen 2000, 217; Van Balen *et al.* 1999, 110). These tests were carried out on samples of a limestone from around Belgium, found to have similar physical and petrographical properties to the Sagalassos limestone (Ercan *et al.* 1997, 424; Van Balen *et al.* 1999, 107). The test results revealed that, with this system, it was possible to join and complete the stone elements so that they are as strong as their monolithic form and to connect the stone elements – horizontally or vertically – so that the connection would be less strong than the stone itself. The main advantage of the system is that its use in restoration is harmless for the monuments, as it is corrosion-free and resistant to a wide range of chemicals. Having a high mechanical strength, it also makes it possible to strengthen the members and the structure itself by minimum intervention. Additionally, the system is compatible with stone, as it acts as a unit, in itself and as a whole with the stone, creating a perfect bond (Ercan *et al.* 1997, 436; Van Balen 2000, 219; Van Balen *et al.* 1999, 116). The problem of differential expansion due to temperature change between the original and the new material can be minimised. On the other hand, the system has some disadvantages. The long-term durability of the fibreglass and epoxy resins, being both rather recent materials, is not yet established. The risk of degradation in the long term, however, can be minimised by using the system in isolation inside the stone (Ercan *et al.* 1997, 436). Reversibility can be guaranteed if a precise dimensioning and methodology is applied, which is an advantage compared to the use of ductile reinforcement materials such as steel or other metallic alloys (Ercan *et al.* 1997, 436; Van Balen 2000, 219; Van Balen *et al.* 1999, 216).

d. Final re-assembly

In the final stage, the treated stone blocks were placed in their original positions on the structure with suitable connections. The results of the tests on dowels prepared by the ancient technique were not satisfactory because the failure always occurred at the stone rather than the dowel. The situation where the connections should have less bearing capacity than the surrounding stone was preferred as, in this way, the ancient stone would be protected by the connections breaking before the stone can fracture. Dowel and cramp connections prepared with the fibreglass-epoxy system proved to be every effective, as it was possible to connect the blocks in such a way that the connection was slightly weaker than the stone itself. Thus, the treated stone blocks were connected to each other with horizontal and/or vertical connections to provide the fixation of the blocks to each other, and thus protect against the relative movements of them caused by horizontal forces such as earthquakes (Ercan *et al.* 1997, 428-432; Van Balen 2000, 217-218; Van Balen *et al.* 1999, 113-115 and 213).

e. Further considerations

Safety measures were taken since much of the work was relatively hazardous and concerned both workers and visitors. Continuous maintenance work of the area, including profiles and excavation sections (Patricio 1996, 107; Patricio and Van Balen 1993, 90) was undertaken. Whenever necessary, the ruins were covered for protection and temporary conservation measures were taken (Patricio 1996, 108).

An important problem was the seasonal only contact with the site, restricted to two or three months of each year. Accordingly, at the end of each campaign, it was needed to make sure that all information was accurate and complete so that it could later be processed elsewhere (Patricio 1996, 104; Patricio and Van Balen 1993, 89).

E3.2.3.4 Publications

A specific publication policy has been delineated with certain categories of materials or certain general topics published in a special series called *Studies in Eastern Mediterranean Archaeology*. Preliminary reports, in the past presented in Anatolian Studies, are still published within two or three years of completion of each campaign, in order to present its results and materials to the scholarly world. A second publication series, called *Sagalassos*, was created to contain preliminary or partial results from all disciplines involved in the project. A third category of papers, presenting more or less intermediate or completed studies of a more general nature, but too limited in length to be published as monographs, are published in various scholarly journals or congress proceedings of each discipline (Waelkens 2000a, 7-8).

E3.2.3.5 Using virtual reality for restoration and reconstruction

Besides the construction of a virtual site consisting of different levels of detail, some other applications to archaeology and heritage conservation are presented. These techniques can be applied to construction of virtual reality models of archaeological sites. Several new applications come to mind, such as testing building hypotheses through virtual reality. The presented techniques allow acquiring the 3D-model of the remains of the building. It becomes possible to carry out a 'virtual reconstruction', reassembling different parts of a monument on a computer screen. This offers a flexible method to test building hypotheses without problems of manipulating the real building blocks. Additional tools could be developed to simplify reconstruction even more; for example broken parts of pillars could automatically be matched using standard registration software (Pollefeys *et al.* 2000, 71 and 76-77).

APPENDIX F (APPENDIX TO CHAPTERS 4 AND 5)

GLOSSARY OF ARCHITECTURAL TERMINOLOGY

acropolis: the fortified ‘upper citadel’ of a Greek city.

acroterion-acroteria: the decoration at the edge or corner of the roof of a building. It is the plinth at the feet of a pediment, which holds statues or ornaments, the entire ornamental element at these angles. It was usually floral or statues.

aedicula-aedicule: in classical architecture means a small room or a sacred shrine. It came to be used for a niche or shrine containing a statue and enclosed by flanking columns carrying an entablature and pediment.

agora: a market place; literally a place of assembly for the citizens.

aisle: subsidiary space alongside the body of a building, separated from it by columns. In ecclesiastical architecture the term was applied to a lateral division of a church where, aisles flanked the nave and choir on both sides, divided from these by an arcade or colonnade.

alloy: a mixture of tow or more chemical elements, at least one of which is a metal.

amphiprostyle: apteral temple without flanking colonnades, but with a prostyle portico at each end of the cella.

andesite: a fine-grained brown or greyish intermediate volcanic rock.

annex: a separate or added building, especially for extra accommodation.

anta: square or rectangular pier formed by the thickening of the end of a wall where the sidewalls or pteromata terminate. Where porticoes were formed by carrying the sidewalls out beyond the front wall of the temple and placing columns in a line between the antae, the columns, portico, and temple are described as *in antis*.

anthemion: classical ornament like a honeysuckle flower.

antefix: ornament on the frieze of early Classical temples, or over pediment acroteria, often of terracotta. It was used in order to conceal the ends of the tiles.

apse: a polygonal or semicircular recess or termination usually vaulted or domed. In classical architecture sometimes is called an exedra.

Archaic: early period of art and culture, especially the 7th-6th centuries BC in Greece.

architrave or epistyle: the lowest of the three parts of entablature, resting directly on the columns.

armature: metal structure used for reinforcement in sculptural decoration and in columns.

ashlar: stone, usually larger than brick that has been square-cut, so that the exposed faces are rectangular.

ashlar masonry: regularly dressed masonry.

attached column: one that partly merges into a wall or pier.

auditorium: a large building for public meetings or performances.

avaton: hall or portico where the seekers of cure slept.

basilica: aisled building, especially a church, with windows in walls rising over the aisles.

basin: bowl for the water in a fountain, or an artificial pool.

base: in architecture, the part of a column between the shaft and the pedestal or pavement.

beam: horizontal structural element supported at each end by means, i.e. walls and columns.

bedding layer: bottom layer.

bema: from Greek word *βήμα*, meaning ‘step’. In church architecture, it is a raised area behind the iconostasis, which contains the altar.

buttress (analimma): pier-like projection of brick, masonry or other material, built either in close connection with a wall needing extra stability, or standing isolated, to counter the outward thrust of an arch, vault, or other elements.

Byzantine: a style, which originated at Byzantium (Constantinople), in the 5th century, spreading around the Mediterranean and, with Eastern (Orthodox) Christianity, from Sicily to Russia later.

capital: the crowning feature of a column or pilaster. Its function is to give an area from which an arch may spring or on which an entablature may rest larger than the supporting column or pier. A capital also ornaments the junction between arch or entablature and column and is helpful feature in identifying a period or style of architecture.

Caryatid: in classical architecture, a female figure used as a column support of an entablature.

cast copy: reproduction of an object, usually in a material that hardens after a time.

cella: the main chamber of a classical temple, which housed the cult image.

cement: substance made by burning a mixture of clay and limestone; ingredient in concrete.

chisel: a hand tool with a squared bevelled blade for shaping wood, stone or metal.

circuit: a line or course enclosing an area.

cistern: a tank for storing water; an underground reservoir for rainwater.

citadel: a fortress commanding a city. Alternatively, an inner fortified city, generally sited upon an eminence, round which the city later expands.

clamp: a device, especially a brace or band of iron etc., for strengthening other materials or holding things together.

Classical: a term used for the specific period of ancient Greece. Its architecture used a range of conventional forms, the roots of which are the orders, Doric, Ionic and Corinthian.

coffer-coffering: decorative pattern on the underside of a ceiling, dome or vault, consisting of sunken panels. In classical architecture they are square, diamond, hexagonal or octagonal. In Roman architecture they are enriched with decorative mouldings and central motif.

colonnade: row of columns supporting an entablature and usually one side of a roof.

column: a vertical structure, usually circular in form. It may be used as support and in decorative schemes in many styles of architecture. It may be made of any building material, e.g. stone, wood, metal, marble, and brick. Columns in classical architecture follow certain specifications of design and proportion. A column has three main parts: the base or lowest part; the shaft, or central, trunk-like section; the capital or top, crowning feature.

concrete: cement mixed with coarse and fine aggregate (pebbles, crushed stone, brick), sand and water in specific proportions. It dries and attains strength not unlike stone.

Corinthian: the most slender and ornate of the three main classical orders.

cornice or geison-geisa: a moulded projection, which crowns a wall, building or arch. In classical architecture, it is the top member of the entablature.

cramp: piece of metal used to hold stones together in the same course.

crane: machine for moving heavy objects, by suspending them from a projecting arm/beam.

crepis or crepidoma: the platform on which a temple stood, normally of three tall steps.

chryselephantine: gold-and-ivory.

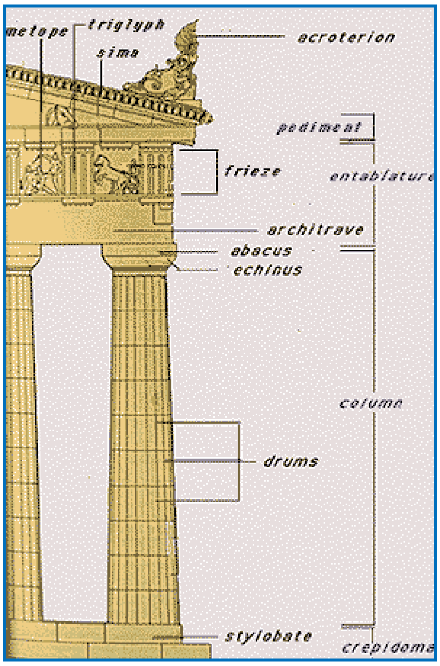
curvature: the deviation of a curve from a straight line.

Cyclopean: large irregular polygonal stones, smooth and finely jointed.

dactyl: (from Greek *daktylos* meaning finger) round-shaped.

disiecta membra: dispersed members.

Doric order: the oldest and simplest of the three orders of classical Greek architecture, evolved in the Dorian and western regions of Greece, characterised by heavy, fluted columns with plain saucer-shaped capital and no base.



dowel: headless peg, pin, or bolt of wood, metal or other material, used to fasten two members together by being set into each part.

drum: one of the nearly cylindrical pieces of which a column-shaft is constructed.

engaged column: a column where a part of its surface is in contact with the wall.

entablature: superstructure carried by columns, divided into 3 parts: architrave (supporting member resting on columns), frieze (decorative portion), cornice (crowning and projecting member).

entasis: the very slight convex (curving out) curve used on columns to correct the optical illusion of concavity (curving in), which would result if the sides were straight.

epikrano-epikrana: the topmost member of a pillar.

epoxy resin: it among the most important resins and perhaps best known as adhesive. It has bonding properties, being suitable for the bonding of glass, plastics, metal and wood, and give very high strength, water resistance, heat resistance and good electrical properties.

euthynteria: below stereobate (only in the ionic order) and part of the crepidoma.

façade: principal face of a building; any side of a building facing a street or open space.

fibreglass: fine glass fibres produced in various forms.

flank wall: an end or sidewall of a structure as distinguished from the front or back.

flute: concave groove in the shaft of a column.

frieze: a deep band, plain or decorated with sculpture or painting, extending round the upper walls of a room below the cornice.

gomfos: wooden or metal nail used to connect structural members.

grain: small hard particle of salt, sand, etc.; discrete particle or crystal in a rock or metal.

gutter: part of ancient building in the form of an open conduit along which liquid flows out.

gymnasium: place for physical exercise and teaching in ancient Greece; called palaestra too.

gypsum or calcium sulphate: when, as a fine powder, it is mixed with water, it sets to a hard mass within a few minutes. It also expands to such an extent that it fills the details of a mould face completely and thus reproduces faithfully the smallest features of an impression. Hard wall-plaster used for the finishing of internal walls can be made from gypsum.

half-column: an engaged (attached) column projecting slightly from the wall a little more than one-half its diameter. This form is most often used in classical architecture.

Hellenistic: Greek architecture and culture from the consolidation of Macedonian supremacy under Alexander the Great (356-323 BC) to the foundation of the Roman Empire under Augustus in 27 BC and after in the Eastern Mediterranean.

heroon: monument dedicated to a hero.

hexastyle: term descriptive of a six-columned portico.

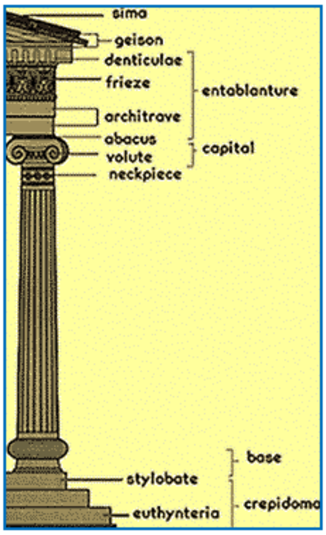
hypostyle: any roofed colonnade, or series of colonnades.

iconostasis: in the Eastern Church, the screen that separates the sanctuary from the main body of the church and upon which the icons (sacred pictures) are displayed.

in situ: in its original place; in its place.

intercolumniation: space between the lower parts of the shafts of adjacent columns in classical colonnades or porticos defined by modules the same size as the shaft diameters.

Ionic order: evolved in the Ionic and eastern Greece. Its characteristics are tall slim columns with 24 flutes resting on moulded bases and crowned by capitals forming a double scroll.



iron: although only second to aluminium in abundance in the earth's crust, iron is the most important of all metals.

iron post: a long stout piece of timber or metal set upright in the ground etc. to support something, especially in building.

jamb: the vertical side members of a doorway.

lead: it has been used from very early times. It is the softest of the common metals and is a very poor conductor of heat and electricity.

lead-plated: covered with plates of lead, especially for protection.

limestone: it is a bedded rock that includes marble and chalk.

lime mortar: it is made from high-calcium lime and has good working properties. It gains strength very slowly, stiffening by loss of water and subsequently by the absorption of carbon dioxide.

lintel: horizontal member, from wood or stone, spanning an opening and supporting the wall above it.

marble: a fine-grained limestone re-crystallised naturally by heat and pressure. The term is applied to any limestone having sufficient hardness for it to be polished and at the same time having a texture and general character fitting it for ornamental purposes.

masonry: art, craft, and practice of building with natural or artificial stone, involving its quarrying, cutting, dressing, joining, and laying; work produced by a mason (dry-stone masonry: rough stones laid without mortar).

mausoleum: a monumental building to house a tomb or tombs.

Mediaeval: period of art and architecture of Europe in the Middle Ages, from the end of the 8^{th} century to the first half of the 16^{th} century, including the Romanesque and Gothic styles.

metope: sunken pictorial panel between triglyphs in the Doric order, approximately square and generally filled with sculptured or carved slabs.

monolithic: it derives from ***monolith***, meaning a single block of material shaped into a column or a monument.

mortar: mixture of sand, lime and water used to cement stones and bricks together. When it dries, it becomes very hard.

moulding: modelled surface given to parts of a building, for instance, an arch, a jamb, a panel, a capital, an entablature. Mouldings are purely decorative, intended to define and accentuate the architectural character of the structure but some are designed to protect a vertical surface by projecting outwards so keeping rain or show away from it. Mouldings and their ornament are characteristic of certain periods of building and are of assistance in identifying architectural style.

mud-brick: brick made from baked mud.

nave: the main arm of a church, west of the crossing and generally flanked by aisles.

Neolithic: period relating to the later Stone Age, when ground or polished stone weapons and implements prevailed.

niche: a recess in a wall or pier designed to contain a statue or decorative object. Many niches are semicircular in plan and are arched.

nymphaeum: grotto or garden building dedicated to the nymphs.

Nymph: immortal woman who personifies a place (spring, river, fountain) or other natural features (threes, the waves) and is worshipped under the name of a locality or the genus.

octastyle: term descriptive of an eight-columned portico.

opisthodomos or opisthonaos: enclosed area at the rear of the temple, utilised as a treasury.

orthostate: vertical stone posts set in the base of a wall to form part of the facing, sometimes carved, e.g. forming part of the revetment at the base of a temple cella.

oxidation: the process of a metal becoming covered with a coating of oxide or of making or becoming rusty.

palm or palmette: sculptural ornament like a symmetrical palm shoot.

pantograph: an instrument for copying a plan or drawing etc. by a system of jointed rods.

parapet: low wall built along the edge of a bridge, balcony or cornice for reasons of safety.

parastas-parastades: part of the flanking wall of a Greek temple porch projecting beyond the front wall, finished with an anta; space between two flanking walls outside the pronaos.

pavilion: it may take several forms: a projecting part of a façade of a building, usually at the ends or the centre; the terminating blocks attached by side wings to the central mass of a building; a separate, small structure of ornamental type to be found in a garden or park.

pedestal: the base as a decorated block supporting a column or colonnade.

pediment: recessed triangular area within the angle formed by the meeting of the cornices at the roof; usually filled with sculpture.

pentelic marble: marble deriving from the Mountain Penteli in Greece.

peripteral: a temple enclosed by columns (by a peristyle).

peristasis: outer colonnade.

peristyle: series of columns surrounding a building or enclosing a court. It can be seen in a classical temple, stoa and domestic architecture.

pila or pillar: plain, unmoulded, undecorated, detached rectangular or square masonry pier, with no allusions to the orders whatsoever.

pilaster: a column of low projection and rectangular form, projecting from a wall and evidencing the same characteristics of the relevant classical order. It may be a supporting member or only a decorative element.

plaster: pasty composition of soft and plastic consistency spread or daubed on a surface where it hardens. It was traditionally made of burnt limestone (quicklime or calcium oxide) mixed with sand, water, and hair to provide a smooth surface fit to receive decorations.

plateau: an area of fairly level high ground.

plaza or piazza: an open space, generally square or rectangular, surrounded by buildings.

plinth: lowest plain square block under the base-mouldings of a column, pedestal or pilaster.

podium: low wall or continuous pedestal, used to support an order of classical columns high above ground level in monumental buildings.

polos: Greek centring-pin or dowel used when joining the drums of the column-shafts.

polychromy: the use of different colours in a variety of materials to give a decorative effect, both internally and externally, to buildings.

polygonal: with many sides and angles.

porch or portico: a covered entrance to a building consisting of a roof supported by columns. It described originally a colonnade, but now specifically a porch with columns.

porous stone: medium to fine-grained golden-grey limestone, used in temple building.

Portland cement: it is made by roasting a mixture of mineral raw material.

pronaos or prodomos: area enclosed by sidewalls in front of the temple, behind the portico.

prop: a rigid support, especially one not an integral part of the thing supported.

Propylaeum or Propylon: entrance as a free-standing gateway to the sacred enclosure of a temple when there is one doorway only; when there is more than one doorway, the plural term '***Propylaea***' is used.

prostasis: the front colonnade of a temple.

prostyle: a temple in which the portico columns stand in front of the pronaos.

pteron-ptera (or pteroma-pteromata): the passageway or ambulatory, formed by columns, between the temple walls and the peristyle.

ramp: inclined plane connecting two different levels.

relief: projection of a design, or parts of it, from a plane surface in order to give a natural and solid appearance.

reinforced concrete: steel rods inserted in concrete beams to help them withstand longitudinal stress without collapsing.

retaining wall or revetment: a wall built to hold back water or support an earth bank; facing, especially of marble, to a wall built of another material.

ridge: the upper angle of a roof.

rod: a slender straight bar, especially of wood or metal.

Roman: art and architecture of ancient Rome during the Republic (509-27 BC) and from the time of Augustus (Emperor 27 BC – AD 14) to the foundation of Constantinople (AD 330).

sanctuary: especially holy place within a church or temple.

sandstone: a bedded rock consisting essentially of quartz-sand grains cemented together by other minerals. There are various types of sandstones.

sarcophagus: coffin of stone or other durable material.

scaffold: a temporary structure to provide secure access for exterior building work.

shaft: the main body of a column or pier between base and capital.

slab: large flat but not very thick portion of any material.

spring: plane at which an arch or vault unites with its impost.

stratigraphy: the order and relative position of strata (a layer or set of successive layers of any deposited substance); the study of this as a means of historical interpretation.

stele: a stone slab, usually decorated in relief and inscribed.

stereobate: top of a foundation or substructure, immediately below the stylobate, forming a solid platform on which a classical temple stands. It is the top of a crepidoma.

stoa: type of ancient Greek portico of limited depth but great length, with a long wall at the back and a colonnade on the front, usually facing a public space.

storey, story: volume between the floors of a building or between its floor and roof.

stylobate: upper step of a three-stepped crepidoma forming the platform on which a Greek temple, any colonnade, or peristyle stands; the uppermost part of a stereobate.

synthetic resin: man-made resinous materials produced by chemical reactions and thus differ from natural resins, which are substances exuded or otherwise produced by plants.

temenos: the sacred precinct surrounding or adjacent to a temple.

temple: a sacred edifice devoted to divine worship and containing the symbol of the deity.

terrace: any artificial or built level platform for promenading, with a vertical or sloping front or sides faced with masonry, etc., and sometimes having a balustrade.

terracotta: a fired earthenware material introduced to Britain from Italy in the 16th century for moulded decoration on buildings. Terracotta is harder and less porous than brick.

tetrastyle: with four columns.

tholos: ancient Greek circular building, often with a peristyle.

thranos-thranoi: bench.

threshold: a strip of wood or stone forming the bottom of a doorway and crossed in entering a house or room, etc.

tie: any member that resists a pull, as to prevent the spreading of two sides of a sloping roof.

titanium: a grey metallic element occurring naturally in many clays etc., and used to make strong light alloys that are resistant to corrosion.

toichobate: the platform on which the walls of a building or temple are raised.

transversal: structural feature at 90 to the main axis of the outside wall, separating one bay of another feature from another.

transverse columns: columns situated, arranged, or acting in a crosswise direction.

triglyph: vertically grooved block separating the metopes in a Doric frieze.

tympanum-tympana: triangular or segmental vertical surface of a classical pediment between its sloping and horizontal cornice mouldings. In many cases it is sculptured.

vault or vaulting: arched interior roofing made of stone or brick.

ward: bailey or court of a building, protected by a wall, etc.

white Portland cement: an ordinary Portland cement with low iron oxide content. Thus, it is white instead of grey. It has therefore a special use where delicate colours are required.

whitewash: liquid of lime and water, used as an inexpensive substitute for paint.

wing: pteron.

APPENDIX G (APPENDIX TO CHAPTER 6)
PROFESSIONALS AND ORGANISATIONS

G1. PROFESSIONALS WHO PARTICIPATED IN THE SURVEY

G2. PROFESSIONALS AND ORGANISATIONS CONTACTED

APPENDIX G. PROFESSIONALS AND ORGANISATIONS

G1. Professionals who participated in the survey

G1.1 Professionals who answered the anastylosis questionnaire

- an architect-heritage consultant in international heritage and restoration organisations;
- a restoration architect from a Finish university;
- two architects from an Italian regional archaeological service;
- an architect-restorer and an art historian from Italian universities;
- an architect working in Italy;
- an archaeologist-architect from an American university;
- a heritage consultant from a heritage organisation in the USA;
- an civil engineer and an architect from Belgian universities;
- an archaeologist from an archaeological service in the Lebanon;
- two architects and a conservation architect from Turkish Universities;
- an architect from a German archaeological organisation in Turkey;
- an architect and an archaeologist from German universities;
- an architect from an Austrian university;
- a conservation architect from a restoration organisation in Malta;
- a conservator-restorer working in Cyprus;
- an architect-architectural conservation consultant from the UK;
- an anthropologist and psychoanalyst from the UK with experience in archaeological restoration in the Oriental East.

G1.2 Professionals who participated in the interviews and discussions

- two architects, an architect-archaeologist, a civil engineer, an archaeologist from a Greek university and a restoration committee in Greece;
- an architect, formerly working in a Greek central restoration service;
- an archaeologist from a Greek archaeological organisation;
- an archaeologist from a Greek university and an archaeological organisation in Greece;
- an architect from a Greek university;
- two architects and an archaeologist from a restoration committee in Greece;
- an archaeologist from a Greek regional archaeological service;
- an archaeologist-restoration architect from a Turkish university.

G1.3 Professionals with whom correspondence was established

- an architect-restorer from a Turkish university;
- a conservator from a British art institute;
- a heritage consultant from a heritage organisation in the USA;
- an archaeologist-historical architect from an American archaeological organisation and member in a restoration committee in Greece;
- an archaeologist from a foreign archaeological school in Greece.

G2. Professionals and organisations contacted

G2.1 Organisations

- a non-governmental heritage restoration centre in Italy;
- a non-governmental centre for architectural conservation in Italy;
- a non-governmental restoration institute in Italy;
- a university (Faculty of Architecture) in Italy;
- twenty governmental regional archaeological services in Italy;
- two governmental central archaeological and conservation services in Italy;
- two non-governmental foreign archaeological schools in Italy and Turkey;
- two governmental central archaeological and preservation services in Turkey;
- three governmental central archaeological services in Greece;
- twenty-seven governmental regional archaeological services in Greece;
- two governmental central restoration service in Greece;
- five governmental regional restoration service in Greece;
- a governmental regional museum service in Greece;
- three universities (Faculty of Architecture, Department of History and Archaeology, Faculty of Communication and Mass Media) in Greece;
- seventeen governmental foreign archaeological schools in Greece;
- a non-governmental heritage institute in France;
- a university (Department of Structural and Architectural Engineering) in Britain.

G2.2 Professionals

- two archaeologist-heritage consultants and a conservator-heritage consultant from international heritage organisations;
- a conservator working in the Mediterranean;
- five architects from a Turkish university and an architect-restorer working in Turkey;
- an architect, two archaeologists, a civil engineer in foreign schools in Turkey;
- an archaeologist and three architects from regional archaeological services in Italy;
- two archaeologists from a foreign archaeological school in Italy;
- two architects from an Italian university and an anastylosis professional from Italy;
- an architect working in Germany with anastylosis experience in the Mediterranean;
- an architect and an archaeologist from German universities;
- an architect and an archaeologist from foreign archaeological schools in Greece;
- an archaeologist-anastylosis professional working in Greece;
- a restorer from an archaeological restoration service in the Lebanon;
- two architects and a museum professional working in Spain;
- an archaeologist from a Portuguese university.

APPENDIX H (APPENDIX TO CHAPTER 8)
GUIDELINES IN THE PLANNING AND IMPLEMENTATION OF ANASTYLOSIS

I. DECISION-MAKING PROCESS

A. Anastylosis should be part of a <u>heritage management plan</u> that will organise approaches and establish the framework of the intervention in terms of:

- the values and significance of the monument and the archaeological site;
- the interpretation and presentation of the monument;
- the identification of the stakeholders and public;
- the theoretical background;
- the technical aspects;
- the organisational matters;
- the financial issues;
- the plans for monitoring of the monument during and after its anastylosis;
- the plans for the future maintenance of the monument.

B. The <u>procedure for determining the need for anastylosis</u> should be conducted in the following stages:

1. Determination of the objectives of the intervention in terms of its contribution to the <u>preservation and presentation</u> of the monument.

2. Identification of the <u>reasons</u> and the <u>driving forces</u> of the intervention.

3. Identification, analysis and assessment of <u>the values of the monument</u>:
historic, artistic, aesthetic architectural, archaeological, scientific, cultural, social, contextual, symbolic.
Values should be judged:

a. according to heritage and context;

b. by being comparatively explored with technical aspects.

Decisions should be based on a *compromise* of value judgements to satisfy all of them. *Economic values* should be assessed in terms of the benefits they can provide.

4. Determination of the type of the structure and its architecture.

5. Assessment of technical aspects and feasibilities of intervention.

It should focus on:

- the available original material and its state of preservation;
- understanding the monument and its structure.

The *available original material* should be assessed qualitatively and quantitatively. Its qualitative and quantitative assessment should be undertaken according to: amount; volume; mass; surface; weight; entirety of members; location; variation in parts of the building.

6. All the above should be comparatively discussed and analysed. The decision should depend on their combination and compromise.

II. PLANNING OF ANASTYLOSIS

A. Management planning and anastylosis

As part of a management plan for the archaeological site in which the monument in question is found the following steps should be followed:

1. Assessment of the values of the monument and the archaeological site in which it is found.

2. Identification of all stakeholders and the public and their inclusion in the processes of value-assessment and decision-making. Ways in which it should be accomplished are: provision of information about the proposed anastylosis and thorough consultation with regard to the set objectives and the ways in which they will be achieved.

Visitor surveys and social studies should be conducted before anastylosis implementation. Their aim should be to assess the values of the monument as perceived by the stakeholders and the public and evaluate the proposal and its possible result. Accordingly, educational and other values of the monument could be properly assessed, without necessarily determining the extent of anastylosis.

3. Planning of anastylosis should take into account the presentation and interpretation of the monument, including:

- interpretation of the monument and the archaeological site in which it is found;
- information on the undertaken works and the final result of the anastylosis.

Explanatory material should be present near the monument and within the site. It should aim at provision of information to visitors about:

- the undertaken works,
- the history of the monument and the site,
- their interpretations, either possible or alternative ones.

These means of interpretation and display can be interchanged before, during, and after completion of anastylosis works. They should be employed in direct relation to the extent of the intervention.

This interpretative material should not impose on the site or the monument but be carefully selected, arranged, and displayed. Such material has the form of:

- signs with drawings and explanatory texts;
- diagrams;
- models;
- video programs.

Its selection should be decided, planned and implemented by all professionals, particularly archaeologists, architects, restorers, educators and interpretation professionals. Any alternative means of interpretation should always be welcome. Experimental archaeology can also contribute to understanding the construction and architecture of the monument and could be considered in the framework of anastylosis works. Education, in terms of experimentation and research, for professionals should also not be dismissed.

4. Planning should also delineate actions for the monitoring of the restored monument and its future maintenance.

5. The circulation of visitors around the site and the monument during implementation of the works should be carefully planned. Minimum disturbance of the visitor experience and the safety of both visitors and workers should be primary considerations. Tourism and visitor management are significant parts of management planning.

6. The planning and installation of the worksite should be the subject of extensive research and carried out with the following considerations:

- topography and location of the archaeological site and the monument;
- ground morphology of the monument and the area;
- choice of technical equipment;
- organisation of working areas;
- existing possibilities for transporting material and equipment;
- state of preservation of the monument;
- extent of intervention;
- aesthetic considerations;
- amount of visitors;
- safety requirements for working crews and visitors;
- possibility of readjusting it, according to the stages of the anastylosis and the needs of the site.

7. In extensive and long-term anastylosis projects, planning should be designed in numerous stages, according to:

- organisational matters;
- the needs of the monument;
- achievement of minimum interruption to the site.

8. Planning for anastylosis undertaken in monuments found in extensive sites:
If site extended in terms of dimensions, establishment of when excavation and relevant research stops and when preservation begins should be aimed at and compromise between conservation and stabilisation of elements and applications of anastylosis should be reached,.

9. Safety measures during the anastylosis works should be decided by experts with experience in working in building sites and take into account:

- the safety of both workers and visitors;
- the temporary coverage of the monument;
- the needs and values of the monument.

10. Planning and provisions for the setting of the monument should be based on respect for the traditional setting and the integrity of the site. They should be planned with careful consideration of the following aspects:

- balance kept among the restored monument and the other ruins in the site;
- programmed anastylosis, restoration or consolidation of other structures on site;
- provisions for acceptable environmental conditions and studies about atmospheric pollution;
- surroundings not drastically changed with modern structures, visitor centres, and other facilities;
- removal of dispersed material and arrangement in the site or in warehouses;
- employed presentation and interpretation methods;
- designation of the way in which visitors can circulate around the site.

11. Management plans and anastylosis proposals should be reviewed yet remain flexible and predict possible problematic issues while including alternative solutions and actions.

B. Theoretical principles of anastylosis

1. Anastylosis should be <u>a matter of conservation</u> and <u>less interventive approaches</u> in monuments. It should be well thought-out with regard to its <u>interpretative effects</u>.

2. Interpretative strategy and vision are essential in deciding anastylosis and should not aim at extensive interventions. This is why <u>minimum intervention</u> should be the fundamental principle.

3. Principal aim of anastylosis should be its actual definition: <u>reassembly of the existing parts of the monument</u>.

4. Respect should be shown towards the <u>form, morphological identity, and architectural unity</u> of the monument.

5. The <u>effect of completeness</u> should never be achieved. Restoration of morphological continuation should be undertaken without hypotheses, if possible. If

insufficient information exists regarding the form and architecture of the monument or parts of it, then nothing should be restored.

6. Respect should be shown towards original elements by avoiding any new intervention on them. If necessary, it should be undertaken only on those elements most affected structurally.

7. Respect should be shown towards architectural and structural members and ensure their autonomy and static function. The structural system of the monument should be respected and followed as far as possible. Anastylosis can be implemented as a means of self-protection of the monument and its members.

8. In implementing anastylosis, compromise should be made between structural stability of the monument, enhancement of its values, and fulfilment of the demand for interpretation and education for the public, if these aims are contradictory.

9. A principle that should be respected and followed in all cases is the reversibility of the undertaken interventions.
The reversibility of intervention should be assessed according to variables of structure and restored blocks. Thus, it can be achieved in two levels: reversibility of the structure and reversibility of the restored blocks.
Prerequisites for achieving reversibility are:

- non-extensive interventions;
- the good preservation state of structural members;
- documentation of interventions and the state of preservation of the monument;
- following the ancient structural system, as far as possible;
- compatible new materials in integrations and connections;
- retreatability (possibility of intervening again) of original members.

10. Authenticity plays a major role in anastylosis. The concept of authenticity in anastylosis should remain flexible and open to different perceptions and contexts.
Authenticity should, mainly, be respected in terms of:

- original structural system;
- individual architectural members;

- original material and form;
- integrated new material;
- workmanship and building techniques;
- aesthetics.

11. Preservation of historic memory should take into account the form in which the monument has survived through years and not make major alterations. Respect should be shown for all historical phases of the monument, including its most recent history. These historical elements can be found in alterations of form and function of the monument in past and present and in its possible history of interventions.

Changes in the appearance of the monument should be limited to minimum. The historical period to be represented should be decided after evaluation of the monument and the amount of information and original material available.

12. Aesthetics should be emphasised in anastylosis and be constantly assessed and evaluated by all stakeholders.

Decisions on what is aesthetically acceptable and what is not in the context of anastylosis depend on and should be made according to:

- exploration of the intention of the creator(s) of the monument;
- assessment of the aesthetic values of the monument;
- speculation on the effect of creating artificial ruins;
- harmony of presentation in the layout of the monument and its surroundings;
- judgements by the public.

C. The extent of anastylosis

The best decision on the extent of anastylosis is to adopt a modest approach.

The extent of anastylosis should be established according to:

- the aims sought to be achieved;
- the values attributed to the monument;
- the structural stability of the building;
- the availability of original material

The extent of anastylosis can be varied in different parts of the monument, according to the following factors: stability of the structure, amount of surviving material, enhancement of values, and aims sought to be achieved.

Original material should survive in amounts of at least 70-80% of the entire monument. As much possible of it should be re-assembled. New material to be integrated should ensure the structural stability of the monument and its members. It should not enhance the architectural form and unity of the monument but rather indicate it. It should not complete in 100% the original material.

D. Anastylosis interventions should be implemented with the collaboration of a variety of disciplines through both multidisciplinary and interdisciplinary approaches.

1. Multidisciplinary approaches can be achieved with collaboration of disciplines: archaeology and its specialisations, according to needs of each monument (epigraphy, art history, and so on); architecture, architectural history, topography, history; conservation, restoration, science; structural and civil engineering, chemical engineering; photogrammetry; geology, metallurgy, geomorphology, archaeometry stonemasonry; photography, illustration; heritage management, planning, public relations, marketing, information systems; heritage interpretation and education.

More specific choices of disciplines that can collaborate should be decided according to the needs of the monument.

2. Interdisciplinary approaches can be achieved by:

- proper training of the disciplines involved;
- understanding of the features of each discipline;
- training of collaboration and connection between the different disciplines;
- equality and respect of all fields in decision-making.

Disciplines should not work next to another but link the results of their answers.

3. Possible collaborations and discussion should be instigated among professionals with diverse expertise and from different countries and contexts.

4. The anastylosis study of the monument should be readily available to experts for constructive criticism and exchange of opinions, before any action takes place. Professionals should be given time to discuss architectural and archaeological matters of the monument and its interpretation, before studying the anastylosis

proposal. In case the monument is in dire need of preservation, then individual conservation treatment of members can be undertaken.

E. Research before intervention

Thorough research should be undertaken before any planning and implementation. It should include analytical studies of all preserved material.

1.1 Archaeological research:

Archaeological research should comprise:

a. excavation as complete as possible of the site in which the monument is found;

b. limited excavations and architectural clearings around the monument to:

- diagnose the consolidation state of the building;
- determine chronologically its architectural elements;
- explore its dimensions and various structural problems;
- enrich the already acquired historical information;
- recover more architectural members that can be reassembled.

Attention should be paid in not destroying the stratigraphical data of the monument.

c. studies of sculptural and architectural elements and features of the building;

d. various archaeological studies according to the peculiarities of the monument, for instance epigraphical studies for stone inscriptions.

1.2 Architectural and topographical research:

Architectural and topographical research should comprise:

a. details on the use and function of the monument;

b. alterations through its history;

c. comparative studies of similar architectural types in the geographical area.

d. historical research of past interventions (*monuments previously restored*).

1.3 Structural study of original components

Study of the original components of the monument should focus on:

- their dating;
- their architectural forms;
- the location in which they are found;
- their original location in the building;

- identification of misplaced architectural and structural elements (*monuments previously restored*);
- identification of the original location of misplaced elements (*monuments previously restored*).

Their documentation should include:

- drawings showing where they were found;
- profiles;
- measurements of dimensions;
- drawings;
- photographs;
- minor observations;
- relevant codes and accessioning numbers.

1.4 Surveys of the ruins, their components, and the setting in which found:

Surveys of the ruins and their components should be:

- topographic;
- graphic;
- photographic;
- written.

1.5 Building information

Information on the building and its construction should focus on:

- exploration of construction techniques;
- study of construction techniques of similar structural types;
- typological, morphological, and structural details;
- studies on ancient connecting joints;
- studies on joining and re-assembly of stone members in the original construction;
- historical research for identification and study of past interventions and alterations (*monuments previously restored*);
- studies on joining and re-assembly of stone members in past restorations (*monuments previously restored*).

1.6 Planning with graphic restorations

The planning of anastylosis interventions should be undertaken in parallel with:

- reconstruction drawings of individual pieces;
- reconstruction drawings of architectural groupings;
- overall architectural design;
- graphic restoration;
- comparisons with other restored monuments to extract information on techniques and equipment employed;
- grouping of blocks and fragments by species, typology, and characteristics.

Alternative graphic restorations should be considered depending upon the amount of surviving material. They should also be flexible to alterations when wrong interpretations and decisions become apparent.

1.7 Technical studies

A wide variety of technical studies may be undertaken to facilitate the conduct of the works, provide the possibility of conducting laboratory experiments and analyses to decide upon compatible and durable new materials and of deciding upon a variety of conservation and stabilisation treatments for deteriorated elements. Yet, caution should be exercised and the possibility of not correctly judging their results should always be considered.

F. Recording and documentation

Exhaustive documentation should precede and follow any intervention.

Recording and documentation should comprise of:

a. information on structural details, specifically:

- different kinds of stones used with descriptions of colour, characteristics, deterioration, construction and building details;
- connection of architectural elements in terms of materials, techniques and ways;
- contours and position of joints.

b. presentation of architectural forms, specifically:

- impressions and drawings in various scales;
- photographs of elements;

- detailed and accurate measurements.

c. photogrammetric records;

d. information on material deterioration, state and amount of preservation;

e. conservation matters, specifically:

- photographs of members before, during and after conservation;
- description of physical condition;
- description of corrosion phenomena, cracks, older repairs, later graffiti;
- description of past and present treatments;
- preserved original surfaces (*monuments previously restored*);
- signs of later operations (*monuments previously restored*);
- past restorations (*monuments previously restored*);
- plotting of damaged surfaces (*monuments previously restored*);
- drawings of new metal reinforcements (*monuments previously restored*);
- drawings of marble/stone additions (*monuments previously restored*).

f. information on material:

- dispersed around the monument;
- removed from the monument.

g. plans and drawings of:

- work-site installations;
- mechanical equipment in terms of tools and devices that will be employed.

h. with regard to planning the anastylosis:

- plans of anastylosis and graphic restorations (ground plans, views, and sections);
- presentation of all working phases;
- presentation of how much surviving material will be restored -- to what heights;
- extensive presentation of the anastylosis proposal and plan.

i. bibliographical references and thorough information regarding:

- philosophical and theoretical restoration theories and principles;
- past studies and interventions (*monuments previously restored*).

Drawings, plans and photographs should accompany all information.

Information should also be as accurate as possible.

It should be included in the final publication of the monument and be widely available.

Records could be computerised for easier access and processing.

Documentation could be archived to facilitate access of scholars and the interested public.
Efforts should be made for preservation of the archives that contain the records of the monument and its anastylosis.

III. IMPLEMENTATION OF ANASTYLOSIS

A. Anastylosis in relation to other types of treatments.

1. Other types of intervention or non-intervention may be employed during the course of anastylosis works, such as removal of members of particular importance to the museum; removal and storage of non-valuable material; display or storage near the monument of the members not re-assemble on the monument; members found in second usage removed from structure to be re-integrated to original locations.

2. Other interventions may include: conservation and stabilisation treatments to be applied to elements deteriorated and in order to ensure their static stability and future protection; reconstruction to be avoided

B. Implementation of anastylosis

1. Historical phases or important artistic and architectural parts

Ideally, all historical phases should be preserved. If a selection of them should be made, then the following factors should be considered:

- the values of the monument;
- the state of preservation of each phase;
- the amount of archaeological and architectural information.

If features or parts are removed, this should occur with exhaustive documentation. Efforts should be made for preservation and presentation of these parts near the monument.

Choices about removal, or not, of artistic and architectural elements from a monument depend on:

- the possibility of reversibility of the intervention;
- the protection of removed members;
- the respect for the original architecture and structure;

- the sacrifice of authenticity;
- the introduction of extensive amounts of new material;
- aesthetics in terms of the end result;
- the possibility of augmenting didactic values;
- the completion of the image of the monument by replacing elements with copies;
- consideration of aesthetically acceptable solutions;
- choices between schematic, or not, representation of removed elements;
- clearly presented information to visitors about removed elements and copies.

For original members found in second usage in other monuments, the solution should be decided upon assessing and comparing:

- the values of the monument in which they are found and the monument to which they belong;
- the values of those members found in second usage.

***2. Original stones*:**

Actions to be undertaken with regard to original stone members are:

- laboratory and experimental tests in order to assess the mechanical, physico-chemical and petrographical features of the original stones;
- exploration of reasons of deterioration of badly preserved structural members;
- subsequent conservation of all deteriorating parts and materials of the building;
- choice of the most appropriate conservation treatment;
- cleaning or stabilisation for the various types of stones to be decided after assessing available options and scientific programs.

Possible actions can be:

- laser cleaning of stone surfaces;
- use of thin lead leaves or membranes among members for waterproofing and prevention of dampness;
- application of protective plasters or other methods.

3. Use of eroded fragments and weathered members:

Assessment of the overall state of preservation of the monument and the individual condition of its elements should be undertaken.

Elements that may be used in reassembly should be qualitatively and quantitatively assessed according to:

- their condition and state of erosion;
- their amount;
- their importance as structural elements;
- the condition of elements close to them;
- the architectural form of the monument;
- the general context;
- whether they derive in that state due to past interventions.

4. Choice of material for additions and completions.

The material for additions and completions is either natural or artificial stone.

Decisions on the new material should be made with regard to:

- its material compatibility (natural, physical, chemical, and mechanical features);
- its durability;
- whether the result would be aesthetically satisfying or not;
- respect towards the original material;
- its harmonious visual integration;
- financial aspects (if not enough funding is available);
- existence of trained personnel and stonemasons;
- enhancement or not of traditional crafts;
- collaboration with stone centres and geological institutes;
- research on available quarries in countries where anastylosis is frequent practice.

Artificial stone as a choice. Steps to be taken:

- careful examination of past examples;
- scientific experimentation in terms of its natural, mechanical and chemical characteristics, durability, compatibility with original stone, and being weaker than the original one;
- care for integration: harmonious, not harmful, efficient, optimal adhesion.

Natural stone as a choice. Steps to be taken are the geological exploration and cartography of the area in which the monument is found, to research:

- the kinds of stones used, in terms of their composition, deterioration reasons, and possible conservation;
- suitable quarries from which natural stone with similar composition, texture and colour to the original can be extracted.

5. Differentiation and harmonious integration of new and original material.

To achieve differentiation and harmonious integration of new and original material aims should be:

- distinction between authentic and new parts;
- truth in presentation;
- non-creation of intense contrasts;
- not overthrowing of the aesthetic view of the restored monument.

Issues to be considered for achieving the set aims:

- respect for the signs of age of original members;
- good quality of workmanship;
- continuity of form of the monument; and
- ability to detect original and non-original members in the long term.

To achieve clear differentiation but harmonious co-existence of new and original material, the choices can be:

- application of contemporary stamp or mark, such as inscription of dates or letters (for scholars);
- use of different texture or colour, abstraction of details, use of a different composition material, new members placed slightly inwards (for the public).

Possible options that should be further explored:

- creation of artificial patina, after speculation on aesthetics and authenticity;
- use of lead leaves or inserts for differentiation among building phases;
- multimedia, explanatory labels and drawings, choices offered by modern technology;
- original light-shade effect.

Combination of less interventive and obvious techniques cannot fake the monument and offend its authenticity.

6. Structural system

The values of the structural system of the monument should be assessed and respected.

Respect should be demonstrated by following the original construction, when possible.

All structural parts should work as independent blocks.

In *already restored monuments*, in which the original structural system has been changed, efforts should be directed towards reinstating it.

If it is not possible to follow the original structural system, only minimum alterations should take place.

Solutions may differentiate from structure to structure, given their state of preservation and attributed values.

Respect for the original structural system can be shown by following the principles below:

- preservation of the autonomy and self-efficiency of the structural members;
- minimum interventions;
- improvement of static sufficiency and anti-seismic protection;
- concern for the structural characteristics of the building;
- economy in the extent of reinforcements;
- reversible operations;
- in cases of mechanical strain, damage of the connections and not the ancient material.

Steps to be taken:

- geological research for monuments found in earthquake zones to assess the earthquake resistance of the structure and the durability of its members;
- further geological engineering studies for hill-top monuments, in order to determine potential cliff instability, including study of the rock mass, diagnosis of causes of deterioration, and assessment of steps to cope with them;

- structural studies to assess the static sufficiency and construction techniques of monuments and individual members and explore measures for their repair before intervening;
- structural studies to include radiography, ultrasonic, and gammagraphy, to check the condition of members without dismantling them.

Problems to consider are:

- the bad preservation state of the structural blocks;
- partial anastylosis may have to follow a different system. Since not all blocks participate in the anastylosis, the ancient system can not be faithfully followed;
- financial problems that may require cost-effective solutions.

7. Connecting material and joining of elements.

To decide on the connecting material the following steps should be taken:

- archaeometric studies to determine the provenance of mineral raw materials and the properties and composition of ancient mortars;
- archaeometric studies to compose appropriate repair mortars;
- metallurgy for examining metals for connections;
- laboratory tests to determine and test mortars and joining materials for the connection of architectural members.

The joining of fragmented material and members should be executed by:

- testing connections to conclude on the correct position of structural blocks;
- checking ancient connecting points and joints in order to establish and evaluate them, and assess the possibility of reusing them in the current reassembly
- research on past connecting joints and ancient connecting materials;
- ancient or modern techniques, depending on the durability of members and their connecting material;
- new joints to be used for connecting broken elements rather than individual members;
- avoidance of drilling new holes on stone members, whenever possible;
- introduction of minimum possible new connecting points.

Aspects to be taken into account in deciding the type of joining material are:

- material should be similar to the original or compatible to the ancient fabric and follow ancient connecting points, if possible;
- each material has different attributes and different advantages and disadvantages;
- diverse materials can be employed in the same monument, for example lighter materials for higher members, and heavier and stable materials for lower members;
- commercial materials should be used after laboratory experimentation to confirm their attributes and their compatibility with the original building materials

Considerations related to the choice of material:

- the role of reintegrated parts;
- the original materials;
- the structural system and its specific requirements;
- the achievement of weaker connections compared to original members;
- the features of the connecting materials: strength or weakness, corrosion free attributes, compatibility to stones, durability, potential retreatability;
- the scale and type of connections, in terms of efficiency, weight, strength, deterioration.

Most common chosen materials are:

- titanium rods and pins;
- epoxy glues;
- fibreglass rods and pins;
- stainless steel rods and pins;
- cement mortars;
- mortars following the synthesis of the old ones;
- lead;
- bronze;
- wood;
- hydraulic lime.

***8. Traditional and new methods and tools*:**

Original and new methods and tools can be employed interchangeably, as they can complement each other and are quite effective in achieving homogeneity, compatibility, reversibility, and minimum interventions.

Advanced methods and techniques can be employed for shifting and reassembling members to ensure their safe handling. They are efficient, easy, and cheap. They offer advantages in terms of results, safety, and preservation. They facilitate processes. They leave modern tooling marks on hidden surfaces, so they can be distinguished in the future.

Ancient methods and techniques can be employed for sculpting and elaborating the stones or juttings, for joining blocks, and protecting stone surfaces. They enhance authenticity of workmanship and result in authentic looking textures, better integration. They are compatible to theoretical and philosophical issues regarding the preservation of ancient techniques. They do not have adverse effects nor do they endanger the structural system and the original material. Further research on ancient techniques and methodologies could establish technological features and devices to attain the best possible and faithful results.

The choice of tools should be made in accordance to the aim of the intervention and the desirable results. Assessment of these factors should be prioritised. Accuracy in anastylosis works and the condition of the monument dictate a judgement of choice. Understanding building practices is achieved with both ancient and modern tools.

Ancient working tools should be preferred if the aims are:

- authenticity of workmanship;
- accurate results;
- study and research on ancient techniques.

Modern tools (e.g. pantograph) can be employed if the aims are:

- accuracy;
- economy;
- reduced need for training.

9. Final re-assembly:

In the final reassembly these aspects should be taken into consideration:

- efforts should be made to establish the original location of surviving members;

- re-assembly of members in non-original locations should be limited.

10. Anastylosis in previously restored monuments:

In *previously restored monuments*, which suffer damages from past interventions or natural phenomena, important aspects of anastylosis are:

- intervention limited to already restored parts, if no more elements will be reassembled;
- correction of morphological and structural inaccuracies, if necessary;
- dismantling of restored parts of the monuments in order to study the correct locations of members, extract harmful connections, and conserve structural elements;
- research to confirm archaeological and architectural features of the monument;
- research on previous conservation interventions on the monument;
- care not to alter the form of the monument as established in the public consciousness.

C. Computer programs and information technology.

Computer programs and information technology can be employed to fulfil the aims below:

a. to draw restoration studies by examining:

- the correct position of stone members on the monument;
- problems of static stability and other issues.

b. documentation matters:

- thoroughly document stages of deciding, planning and implementing anastylosis;
- issues of reliability, accuracy and honesty of the information presented.

c. multimedia tools and possibilities for virtual anastylosis:

- to reconstruct and visualise monuments and sites, for guiding ongoing anastylosis efforts and testing building hypotheses without manipulating the real blocks;
- to present sites to non-specialists, enhancing interpretation and improving the legibility of the structure.

IV. POST-IMPLEMENTATION ASPECTS

A. Availability of documentation

<u>Publications</u> of the monuments, covering all aspects (archaeology, architecture, history, anastylosis), should be available to the professional community.

<u>Documentation</u> of the monument and the anastylosis works should be <u>available and accessible</u> to all those interested. It should include initial and final publications, proceeding of conferences and any other information. The language of the publications should be carefully chosen in order to make information accessible to the majority of professionals and interested researchers.

The creation of <u>anastylosis archives</u>, both in regional, national, or international level, would disseminate information and make anastylosis material widely available to interested professionals, researchers, and the public.

B. Assessment of the results of anastylosis

<u>Assessment of the final result of anastylosis</u> should be undertaken by both professionals, in a way of self-criticism, and stakeholders, through visitor surveys and social studies. It should be widely available to those interested, in order to formulate further anastylosis plans for other monuments or for the specific monument in view of current experiences, mistakes and successes.

C. Future maintenance works

The implementation of maintenance works should begin after assessing the needs of the restored monument and according to the estimated deadline by the professionals.