Ch. Boursa, Theoretical principles of the interventions on the monuments of the Acropolis
M. Ioannidou, 2000-2007, The restoration of the Acropolis by the YSMA
F. Malleouchou-Tufano, E. Petropoulou, Public opinion poll about the restoration of the Acropolis monuments
D. Englanos, Protective filling of ancient monuments. The case of the Arephorion on the Athenian Acropolis
E. Lembiski, On the occasion of the new restoration of the temple of Athena Nike.
Looking back at the history of the cult statue of Athena Nike
C. Hadziolani, I. Kaimara, A. Leoniti, The new educational museum kit “The Twelve Olympian Gods”
F. Malleouchou-Tufano, News from the Acropolis
F. Malleouchou-Tufano, The restoration of the Erechtheion: 20 years later
Under the circumstances, we were obliged to manage and to perform interventions of great importance on monuments of unique value for the entire world, on architectural works that expressed the artistic volition and merit of the citizens of a city that once not only held hegemony over all Greece but, in terms of culture, supremacy through all antiquity. The heavy responsibility of undertaking this work of rescue required not only held hegemony over all Greece and merit of the citizens of a city that once working and to perform interventions of large or small. The principles, indeed, are to manage and to perform interventions of monumental, which is achieved through the use of marble, a material both difficult and valuable. This clarity of form is in total correspondence with the lucidity of the word, of reason. The hidden harmony of the refinement combines with the Doric seriousness and balance of volume to achieve a perfect, harmonious result. And this is based on perfection of construction, when sculptural members many tons in weight are set in place with the precision of a tenth of a millimeter. For the ancient Greeks, there were no other values. The temple was a dedication to the god, without interior function and the relevant cult practices took place in the open air. It had no utilitarian value. The concept of historical values began to be apparent later on, with the treating of culture, the collections, the copies and the whole retarded outlook of Alexandria and Rome. The boundaries standards set by the Athenian monuments will never be surpassed. Hellenistic and Roman architecture during the next six centuries produced imitations with other goals and with quality in practically continuous decline.

What have we, the modern Greeks, inherited from that architecture, unprecedented in all the world? After catastrophes (wrought by human beings and not by the forces of nature) we have inherited a pile of ruins. The constructive and formal self-sufficiency of the architectural members means that the ruins preserve their artistic value to a great degree. Since antiquity the structural nature of the members gradually became apparent: invisible joints in both columns and overlying members became visible and for various different reasons gave a new character to the monuments, the character of the ruin. The collapse of the roofs and the pillaging increased the ruinous aspect, which was consolidated later. This is not a natural collapse (where one observes the inner law of the damage and fall) but is the product of violent activities. Despite that, in the eyes of the travelers and painters of the period before the War of Independence, the romantic image of the Acropolis monuments was created, together with the desire for things to remain unchanged. Immediately following the Revolution interventions began on nearly all the monuments of the Rock, for the purpose of removing all which is the greater good. In accordance with these articles, the later deformations, changes, even vandalism, are part of the history of the building, having left their marks on its body and they are therefore to be preserved. Yet, they change the form of the building and they remove us from the ideals of the creator of the work. On the Acropolis, the massive clearing between 1835 and 1890 (a well known example being the so-called Frankish Tower of the Propylaeum) has delivered us of this dilemma. Yet, valuable evidence of the mediaeval history of all the monuments has been lost. Be that as it may, the tower in the opisthonaos of the Parthenon has survived and Professor Manolis Korres has planned for this same monument, “syn-anastelosis” a simultaneous anastelosis of remains of more than one period, in this specific case, restoration of the remains of the Byzantine apse of the church of the Christian Parthenon, in addition, to restore the marble pieces that had been removed earlier from the Roman west door of the monument, to their original state as bases for ex-votos around the temple. The reinforced cement fillings of the Parthenon west door placed by Balanos, however, can in no way be considered as “phases” of the great temple. Article 5 of the Charter refers to utilitarian values, and recommends the use of the monuments for public purposes. During the decades of the 70’s and 80’s, the reuse of the monuments and “integral” restoration was considered obligatory in all interventions. Yet, what meaning has all this when applied to the monuments of antiquity such as those of Athens? Their only “use” is to be considered exhibits of great artistic and educational value. Thus, the monuments that are “not living” become more useful when they are more comprehensible to the general public and when, in various ways, they can “touch” their message and promote their aesthetic values. Article 8 of the Charter provides that “The
sculptural, painted or decorative elements, which are an integral part, inseparably bound to the monument, may not be separated from it, unless that is the only way of insuring their preservation. The sculptural decoration of the Parthenon, the Erechtheion and the temple of Athena Nike, after the destruction and theft of Elgin, were well enough preserved in situ on the three monuments. Apprehension as to their condition had already surfaced before the war and it reached a peak in the decade of the 60’s when the accelerated destruction of their surfaces from acid rain and pollution became apparent. The hesitation over cleaning them and exhibiting them in a controlled atmosphere went on for decades, cleaning them and exhibiting them in a museum surroundings. The disadvantages are the limits resistance of artificial stone over time in comparison to marble, the impossibility of giving the surface the clarity or transparency of the marble and the difficulty of harmonising the colour with that of the monuments. These question have indeed been the subject of endless discussions in the Committee and long research by civil engineers, chemists and conservators. The principle that is retained in this case is that of the least possible change in the image of the monuments that we have to now. Thus, only the sculpture removed from each monument is replaced by a copy. Sculptures removed at another time (such as those taken by Elgin) are not replaced by copies, since there is always the fear that when copies exceed the limit of necessity, the authenticity of the monument may suffer. The only exceptions to this comprise the northernmost columns of the east porch of the Erechtheion and one of the Caryatids, now in the British Museum, which have been replaced by exact copies in order to restore the closed plan of the two porches.

Articles 9 and 15 refer to restoration with the help of fillings and to the anastelosis of archaeological finds. The use of fillings that are not precisely correct morphologically or have not been preceded by an archaeological study is forbidden. In the Acropolis works, the systematic research that had already been carried out has revealed every formal detail of the monuments and it has led to new discoveries by M. Korres on the Parthenon, by A. Papagnokakos on the Erechtheion and on the Propylaia by T. Tanoulas. Research in depth, indeed, made possible the removal of architectural members that had been placed incorrectly in the anastelosis of N. Balanos.

Article 12 is concerned with the harmonious incorporation of the necessary fillings. Interposed, however, is the stipulation that: "the fillings must be distinguishable from the authentic parts so as not to falsify the artistic and historical evidence of the building". For the classical Greek monuments in particular, this article must be applied with utmost sensitivity because each change in the original forms affects the morphological unity of the entire monument. In accordance with Article 15, fillings on the Acropolis have for years been restricted to the absolutely necessary, in order to assure the stability of the ancient architectural members and the desired morphological continuity.

The systematic documentation and the publications stipulated in 1964 by the Charter have been greatly simplified by computers and the technical assistance provided by digitisation. Metrical drawings, photography and cinematography document all phases of the work, and are inserted in a data base, which will soon be available to everyone through the internet. At the same time, many of the studies have been published as books and each year an Acropolis News Letter for the general public is published in Greek and in English. This assures complete "transparency" of the work of both the Committee and the Service.

The method of construction in ancient Greek architecture, which was built from cut stone members, as dry masonry, has made it possible to respect two more principles in addition to those of the Charter of Venice. The principle of reversibility of the interventions, the possibility of reconsidering errors in the future, is based on ultimate respect for the architectural members that are never to be removed, and on detailed documentation of the interventions in all phases.

The second principle concerns the preservation of the structural self-sufficiency of the architectural members with the restoration of each one separately to its original structural function, and employing the ancient technology for their final curving and filling.

The general development of society creates in the topics examined as well a drive to assess the values of the architectural heritage and, as a result, continuous review and improvement of the principles that dictate the interventions on monuments and on historical complexes. This is a never-ending process of evaluation of the ways in which the past is to be handed on to the future. That does not mean that the Committee for Conservation of the Acropolis Monuments alters the principles it adopted in 1975, since the nature of our monuments is unique: the problems of modern monuments and complexes that occupy restorers internationally, by good fortune do not concern us. It means, rather, that our experience continuously expands and our critical ability improves, allowing us to make choices that are more correct when alternate solutions are at hand.

Professor Emeritus Charalampos Bouras
President of the ESMA

* The text in hand was presented at an One-day Conference on the works of the Acropolis, on the 16th of March, 2007, in Thessaloniki.
The Acropolis Restoration Service (YSMA) was established in 1973 by presidential decree, as a special research institute within the Ministry of Culture. Its aim was to carry out restoration work on the Acropolis, by creating a specialized scholarly and technical staff, implementing scientific research, and combining the administrative and technical staffs of the Ministry of Culture. The YSMA was given the task of managing all restoration projects on the Acropolis and its monuments. It was also responsible for the preparation of the restoration programme, which covered the entire Acropolis. The YSMA was also tasked with managing the financial and technical aspects of the restoration projects and ensuring that they were carried out in accordance with the highest scientific standards.

The restoration work on the Acropolis began in 1973 and continued until 2004, with the last works completed in 2008. During this period, a total of 300,000 tons of marble were used for restoration work, and 80,000 people were employed in the YSMA. The restoration work included the reconstruction of 22 monuments, including the Parthenon, the Erechtheion, and the Temple of Athena Nike. The work involved the use of new technology, including the use of lasers and computerized tomography, to ensure the accuracy of the restoration work.

The results of the restoration work were presented in the publication "22000000--22000077, TThhee  rreessttoorrattiioonn  ooff  tthhee  AAccrrooppoolliiss  bbyy  tthhee  YYSSMMAA," which was published in 2004. The publication included information on the work carried out, the materials used, and the results obtained.

The restoration of the Acropolis was a major undertaking that required a significant investment of time and resources. It was a testament to the commitment of the Greek government and the YSMA to preserving this important cultural heritage for future generations.

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drums made of new marble. In accordance with the relevant study by Prof. M. Korres, the first three columns from the north were fully restored, the other three partially. In addition to the column drums, the ancient architrave blocks of the first two intercolumnar spaces were set in place on the monument. In accordance with the decision by the Central Archaeological Council, the fillings in new marble of the column drums were to remain unfilleted. During the actual work, however, in an effort to improve the aesthetic result, 48 flutes were mantled members of the entablature and the east copies of the west frieze, which had been made of artificial stone of a new improved composition, which was determined after a series of relevant test-studies. Completion of this work, before the Olympic Games, made it possible to remove the scaffolding from this area of the monument. Thus, on the 12th of August 2004, the view of the west façade of the Parthenon, free of scaffolding and illuminated, was beamed by television throughout the world during the ceremony of the lighting of the Olympic Flame. In February 2007, the Central Archaeological Council approved the removal of the seven westernmost metopes of the north side of the Parthenon, still in situ, in order to better protect them in the Acropolis Museum. It is planned to replace them on the monument, according to the usual practice, with cast copies. The intervention planned includes as well the removal and structural restoration of four already restored cornice blocks, four filling stones, one triglyph and, in addition, the structural restoration of all the underlying members. With the conservation of the metopes completed in situ, work has begun on removing them. The process of making their cast copies is under way as also the study for application of the work. In addition to the works in progress today, studies are being made of the areas of the Parthenon where future interventions are planned. The most important of these is the study of the west façade since after detailed examination it is clear that the general condition of that area is very critical, both in the parts preserved in situ and in the sections where interventions were made by N. Balanos. In accordance with the general study-plan for restoration of the Parthenon by Korres and Bouras of 1983, a rescue intervention is needed as a first phase in order to replace the rusted clamps and dowels in parts of the west façade that were restored in the past (corners of the pediment, 1st, 4th, 5th, 7th column capital etc). In a second phase it is planned to reset in the façade of the building ancient fragments that have been identified and to do restoration of an aesthetic/didactic nature. For a definite programme of intervention (with credible time-schedules, economical, technical budget etc), what is needed is an analytical study for its application, the precise and in-depth knowledge of the preserved condition of the areas and, especially, the determination of the final extent of the intervention (if, for example, it will include taking the west metopes to the museum that are still in situ on the monument, or even the end metopes on the north and south sides at the west). Making decisions on these matters is extraordinarily difficult, first of all for the master of the Parthenon, which dominates the site of the Acropolis and which has never been dismantled in the past. The relevant architectural study has already been completed, both by the undersigned and the archaeologist E. Papavasiliou, V. Papachristou, V. Pachadaki (1993), and by the architect T. Tanou, in charge of the work, with the scholarly personnel, the architect K. Karanassos, the civil engineer V. Papavasiliou, V. Papachristou, V. Pachadaki (1st 2003). The undersigned and the archaeologist E. Papavasiliou, V. Papachristou, V. Pachadaki. The restoration of the ancient architectural members of extensive parts of the magnificient ceilings of the central building, that very part of the monument which was so much admired already in antiquity, is proceeding. Today’s anastelosis—over a surface approximately double that earlier restored by N. Balanos—became possible through extensive research on the fragments of members that were dismantled from the restored ceilings and the ceiling fragments that had not been used in the previous intervention. The study showed that a great many fragments of architectural members (beams, coffers slabs and inter-beam slabs of the ceilings of the monument, could again be restored with the addition of small amounts of new marble and could be placed in the ceilings in their original positions or in positions comparable to their original. Specifically, set again in the ceiling of the east portico of the central building, in the three first from north inter-beam spaces, are seven beams (four more than in Balanos’ anastelosis) and coffers of four ancient fragments that did not belong together, has been kept in the Acropolis Museum. The capitals of new marble, exact copies of the ancient prototypes, were carved by hand by the marble technicians of the Propylaea. In a few months, when the anastelosis will have been finished, the entrance to the interior of the Acropolis along the central passage through the Propylaea between the two Ionic columns, will enable visitors to have the unique experience of the roofted space of one of the most impressive monuments of classical antiquity. The partial restauration of the north wall of the central building and the east portion was in essence a work that was inserted into the programme of restoring the ceilings of the Propylaea, when it was realized, after the overlying members were dismantled, that the intervention of 1909-1917 had involved a significant number of blocks in those parts of the monument. The earlier intervention had in all probability extended to the north wall in order to reduce the deformations that were caused in the great explosion of the 17th century. This realization, together with the obviously bad condition of the iron reinforcements of the earlier anastelosis and the resulting cracking of the members, necessitated a gradual extension of the work during the present intervention. It was now necessary to dismantle fifty-five architectural members of the north wall, among them the three architrave blocks above the wall, the corner triglyphs, the metope and a block from the doorway wall. A similar problem emerged during the dismantling of the column drums of the east portico, where the known documentation showed intervention on...
Since 2000, conservation and anastelosis has been carried out on the temple of Athena Nike, in accordance with the study by D. Giraud. The work is being directed by the civil engineer D. Michalopoulou with the scholarly personnel, K. Mamalougas, architect, and E. Lebidaki, archaeologist. The serious damage and structural problems that were evident in the temple, after the earlier anastelosis interventions of 1835-1845 and 1935-1940, made necessary its restoration, with total dismantling, structural restoration and re-setting of its 319 members. The frieze of the temple had already been removed in 1998 and placed on exhibition in the Acropolis Museum. The intervention was expanded to include the remains of the poros shrine that is preserved in the underground space beneath the marble temple, whose members underwent conservation. The programme included also the replacing of the slab of reinforced concrete, on which the temple had been assembled in the past, with a grid of stainless steel, on which the temple now stands. After the crops of the monument were removed, the cella blocks were reset in a new arrangement correcting the earlier misplacements, in accordance with the study by the architect K. Mamalougas. Restoration of the temple of Athena Nike will be completed with the setting of copies of the Ionic frieze in artificial stone and the anastelosis of part of the east pediment, the corinices blocks and the sills of the temple with extensive fillings in new marble.

The Acropolis Restoration Service has an organized Section of Surface Conservation of the Monuments, directed by the chemical engineer E. Papakonstantinou, with a scholarly personnel comprising the following conservationists: D. Garhu, D. Damanos, Ch. Lukardis, A. Maradikis, A. Panou (head of the Parthenon team), S. Papap, A. Tsakiraki (head of the temple of Athena Nike team), E. Frangiadaki, G. Frantz (head of the Erechtheion team), K. Frantzakakali (head of the Propylaia team), and A. Haniopappas. Since 1987, the Conservation Section has been faced with damage to the marble surfaces of the monuments resulting from internal composition, environmental factors and the actions of man. The methodology for interventions of surface conservation on the monuments was planned by the late professor and founding member of the ESMA, T. Sfoulakis. It is constantly enriched by new information stemming from the works in hand and from interdisciplinary collaboration with specialists. The materials used in conservation are inorganic, of lime composition, especially designed as to their physicochemical and mechanical properties so as to be compatible with the damaged marble. Wherever reinforcement with metal elements is needed, stainless steel is employed. Organic materials have been ruled out because they have a limited life-span, they are affected by the ultraviolet rays of the atmosphere and they are incompatible with the marble. Rescue and systematic interventions for surface conservation is being carried out on the areas of the monuments being restored and in other places that show severe surface damage, including the Erechtheion. The Conservation Section of the YSMA is also working in the Acropolis Museum, doing research on sculpture fragments, identifications, joins and preparing objects for exhibition in the New Acropolis Museum. In the framework of this collaboration of YSMA with the Acropolis Ephorate, specialized conservators of the Service are the heads of the technical team now preparing and wrapping the sculpture that is to be transported from the old Museum on the road to the New Acropolis Museum at the foot of the hill.

Conservation of the blocks of the west frieze of the Parthenon is certainly among the most suitable is the Laser method, in an original system, with the simultaneous use of two rays, infrared and ultraviolet, a system developed by the Technology and Research Foundation (ITTE). The work was carried out between 2002 and 2004 with excellent results. After cleaning, the surfaces were sealed with plaster without aesthetic remodelling of the relief, in accordance with modern conceptions of conservation. Thus, from July 2004, visitors to the Acropolis Museum have been able to admire again this sculptural complex of unique historic and artistic value, in all its richness and its beauty.

In addition to the four great monuments, the work of the YSMA extended to other
The Acropolis Restoration Service decided to backfill the foundations of the House of the Arrephoroi, the remains of which had been found northeast of the Erechtheion and against the north Acropolis Circuit Wall, in order to protect its fragile poros foundations. The work was completed in May 2007.

The programme for Inventorizing the scattered ancient fragments lying on the Acropolis began in 1977 and was finished at the end of 2006. The purpose was to recognize the fragments, which were lying in 25 large piles, and to attribute architectural members to the monuments, so as to be used in the anastelos programmes. This was accompanied by the identification of fragments of sculpture and inscriptions that were moved to the Acropolis Museum. By the end of 1999, 14,000 members had been inventoried, and between 2000 and 2007, the archaeologist K. Kissas had recorded 7,000 more fragments. The programme will continue from 2007 with the inventorizing of scattered poros members.

Likewise included in the works of the YSMA is the Lift giving access to the Acropolis to people with special needs. The installation of a lift on the north side of the Acropolis, under the guidance of the mechanical and electrical engineer, S. Oikonomopoulos, was finished in the record time of 5 weeks, in order to have it ready for the Olympic Games of August 2004. Since then it has worked without interruption due to high technical ability and experience and the technical equipment of the Service.

Important and necessary for the YSMA to function are the sections that support the work: that of Electromechanical support headed by the mechanical and electrical engineer, S. Oikonomopoulos, the Laboratory for producing moulds headed by the undergarde, the Laboratory of specialized photography and cinema headed by the photographer S. Mavrommatis, the Accessory office headed by P. Katsimichas, the Secretariat headed by C. Papancholou, the Supplies office headed by T. Fournas. Special sections of the YSMA are those of Information and Education headed by the architect-archaeologist C. Hadziadani and of Documentation headed by the archaeologist F. Malouchou-Tufano.

For every work of monumental restoration—and all the more for the Acropolis—it is absolutely necessary that the citizen be continuously informed on the subject and that it be connected to education. For this reason one of the priorities of the YSMA was to be in touch with the general public and with the educational world, in the belief that the first step in respecting and conserving a monument is to make the citizen aware from an early age. This is successful through the educational programmes, in which the children come to know the monuments and the works being done, they take part in the unavoidable theoretical discussions and they gain direct experience. The Department of Information and Education organizes educational programmes for defined groups and in particular for school classes on the subject of the Acropolis and its monuments, holds seminars for educators and for students in order to educate them in the subjects of classical architecture and art and to inform them about the anastelos of classical monuments. It also produces educational material, special publications and museum kits that it sends out on loan or presents permanently to schools. It organizes special symposia for educators and publishes the proceedings. In addition to all this, it plans exhibitions in collaboration with the scholarly personnel of the works and others. Analytical documentation of the works of anastelosis and conservation, apart from being required by international restoration ethics, assures in addition the theoretical principle of reversibility of the intervention, which has been applied from the beginning of the works on the Acropolis. All phases of the interventions are documented using various methods. This includes recording the works in daybooks, documentation by drawing (topographical drawings of the extant condition of the monuments, drawings to show the structural restoration of architectural members, mappings showing the...
A basic aspect of every large restoration project is to inform the public, especially when this is being carried out in an archaeological site that receives great numbers of visitors daily. The regular evaluation of the general public’s reaction to works of restoration may well contribute to a more effectively planned communication policy by a restoration service, such as the YSSM. With this perception as starting point, research on public opinion about the restoration of the Acropolis monuments was planned and put into practice. The research was focused on exploring the visitors’ views about restoration in general and in particular about the practices adopted by the Committee for the Conservation of the Acropolis Monuments (ESMA).

The method of a questionnaire was considered suitable for approaching a large and complex public, while keeping demographic characteristics and varying interest. Questions on archaeological sites were avoided in planning the questionnaire as they might discourage visitors from participating in the research. Particular care was given in framing the questions so as not to direct those questioned to particular answers but, on the contrary, to give them sufficient alternative options so they could define their outlook accurately. The limited amount of time the visitors could spare before their departure from the archaeological site was taken into account as was the physical fatigue resulting from their tour on the Acropolis. This meant the compiling of a questionnaire that was as short as possible.

The conduct of the research was assigned to the public opinion surveys company Metron. Research was carried out over a period of six months (June-November 2006), during three randomly chosen days each month, from 11 a.m. to 3 p.m. The questionnaire was translated into five languages; English, French, Spanish, Italian and Chinese. A total of 1032 visitors took part in the research.

The results, which were handed in to the YSSM by the public opinion surveys company, can be arranged in five categories, corresponding to an equal number of units of the questionnaire.

- General characteristics of the visitors (Quest. 1 to Quest. 16)
- Special characteristics of the visit to the archaeological site (Quest. 9 to Quest. 12) - Opinions about the restoration of the monuments (Quest. 1 to Quest. 5)
- Degree of contentment with the restoration and the visit (Quest. 6 to Quest. 8)
- Special characteristics of the visit (Quest. 9 to Quest. 12)
- Opinions about the restoration of the monuments (Quest. 1 to Quest. 5)
- Degree of contentment with the restoration and the visit (Quest. 6 to Quest. 8)
- General characteristics of the visitors

To begin with it was thought worthwhile to explore the demographic profile of the visitors. Analysis of the replies showed that both men (53%) and women (47%) participated in the research. The age groups best represented are 31 to 45 years (37%) and 18 to 30 years (35%). The remaining sample ranges between the categories of 46 to 60 years (21%), over 60 years (4%) and below 18 years (3%). An interesting finding of the research is that the overwhelming majority of visitors (81%) had received upper or higher education, while only a small percentage of those asked (15%) had terminated their education at the middle level. Exploration of nationality revealed that the European countries (with Spain, France, Italy, Great Britain and Greece predominating), and United States of America have the strongest representation.

Special characteristics of the visit to the archaeological site

In planning the questionnaire, it was considered worthwhile to explore the special features of the visit. Factors such as previous experience, the social environment of the visit (as part of an organized group or independent visit) and the sources of information used during the visit may affect the process of absorbing information and, by extension, the impressions and views of the visitors. In this sense, they form an interesting base of analysis for the results of the research.

During the processing of the answers, it was found that 70% of those asked had visited the archaeological site of the Acropolis on their own, while 27% had come with an organized group. It should of course be emphasized that this picture in no way represents the total of the visitors. Quite otherwise, every-day observation of visitors to the Acropolis has the strongest representation.

Public opinion poll about the restoration of the Acropolis monuments
representation is due mainly to the unwillingness of organized groups to participate in the research, evidently because of the great time frame in which their visit is carried out. Even so, because participants in the same group tend to have similar demographic features and common perceptions during the visit, the results yielded by analysis of the answers, with a small margin of error, may be generalized in the population under investigation, as a whole.

Of particular interest is the finding that the guide and 30% of the archaeological guidebook or other printed matter. In this case too the visitors had the option of more than one choice.

Opinions about the restoration of the monuments

Questions 1 to 5 form the basic body of the questionnaire, since their purpose is to investigate the opinions of the visitors about the restoration of the monuments. To question 1 (“According to your opinion, what are the reasons for the restoration of the Acropolis monuments?”), 73% of those asked were investigated through questions 3 to 5. For reasons of economy, but also to make it simpler for the reader, in the analysis that follows the answers have been gathered into wider categories. Thus, combined in the category “I agree” are the percentages of the sub-divisions “I totally agree” and “I rather agree” and, correspondingly, the percentages of the sub-divisions “I completely disagree” and “I disagree to some extent” are combined in the category “I disagree”.

To question 3 (“During the restoration, the monuments are being supplemented with new marble. What is your opinion of this practice?”), 66% of those questioned replied that they agree, whereas 16% disagree. To question 4 (“During the restoration, the original sculptures are transferred to the museum for maintenance/ protection and replicas are placed on the monuments. What is your opinion of this practice?”), the percentage of the respondents who agree is impressive, at 82%, whereas those disagreeing are limited to 9%.

These viewpoints were explored further in Question 5. Here the visitors were asked to take a position between opposing propositions. Four opposing schemes were presented to those being questioned and they were asked to choose the one with which they most agreed. The first opposing pair comprised the statement “the restoration brings out the appearance of the monuments” as opposed to “the restoration distorts the appearance of the monuments”. 44% of those questioned agreed with the first proposition, whereas only 25% agreed with the second. The percentage of those who took no position at all came to 27%.

Degree of contentment with the work of restoration and with the visit

It was considered necessary to make up the questionnaire to explore the visitors’ total impression of the archaeological site and the restoration of the monuments, especially in relation to the visit before the visit. The degree of contentment can be a significant factor in understanding the work being carried out on the monuments of the Acropolis, both for the one who leaves the archaeological site with positive impressions is more likely to consult secondary sources of information after his visit. To the question “How do you see your attitude towards the restoration of the monuments during your visit?” 39% of the respondents replied “very positive”, 46% “rather positive”, 4% “rather negative” and only 1% had a “very negative” attitude. 10% of the visitors replied “neither positive nor negative”. To question 7 (“Would you say that the architecture of the Acropolis monuments came up to your expectations? If so, to what degree?”), 43% replied “absolutely”, 34% “very much”, 16% “quite”, 4% “a little” and only 1% replied that the architecture does not correspond “at all” to their previous idea. Finally, to question 8 (“According to what you were expecting to see, how satisfied or dissatisfied were you with the overall experience of your visit to the Acropolis?”) 44% of those questioned replied “very satisfied”, 45% “rather satisfied”, 6% “rather satisfied or dissatisfied”, 9% replied “rather dissatisfied” and only 1% claimed to be “very dissatisfied.”

Spontaneous comments and observations

In an open question added at the end of the questionnaire, the visitors were asked to comment freely on the restoration of the monuments of the Acropolis and on the overall visiting experience. The replies numbered 269, 32% of which had favourable comments in general about the Acropolis, 15% made favourable comments about the restoration, 14% were negative about the restoration, 12% expressed some dissatisfaction with the archaeological site of the Acropolis and 4% expressed impatience about the completion of the works.

Conclusions

A penetrating look at the above results enables us to understand the opinions of the visitors about the restoration of the Acropolis monuments. It would not be exaggeration to say that as a whole the visitors react positively to the work of restoration. Even when they do not know the specific reasons that made restoration necessary, the visitors are convinced that the efforts being made are for the protection of the monuments. This choice is indicative of the high position the protection of the monuments has on the scale of evaluation in the mind of the general public, in comparison to their educational value or, much more, their profit-making potential. Beginning with this conviction, most of the visitors approve of the restoration practices that are being adopted, such as the filling in of ancient architectural members with new marble, or the removal of sculpture from the monuments to protect them. In particular for the critical question of replacing the sculpture with replicas, it appears that there is almost unanimous approval on the part of the respondents. These results are slightly different, without reversing the general pattern, when the visitors are asked to take a position between a positive and a negative statement. The positive statement describes the need for the monuments to undergo restoration with the aim of bringing out their appearance and better preserving them. The negative statement refers to the distortion of authenticity of the monuments or the reduction of their aesthetic quality. A significant number of visitors (a quarter of those asked, approximately) appear to hesitate in taking a position on one or the other view. Even so, the percentage of those who recognize the advantages of the restoration is very high, reaching 50% in the case of the removal and transportation of the original sculpture to the Acropolis Museum.

On the basis of the results of the survey, one could argue that the appearance of the Acropolis monuments corresponds to the expectations the visitors had before their visit. We can also say that the degree of satisfaction with the entire experience of the visit and with the works of restoration, is particularly high. The individual comments were...
at the end of the questionnaire are, to a
great extent, positive and encouraging for
the works. A considerable number of the
visitors say that they would like to see the
work finished, while others compare the
present appearance of the monuments with an image
derived from an earlier visit.

For each question in the questionnaire statistical ana-
lyses were made by sex, age, nationality and the
educational level of the vis-
itors, the way in which their visit was made, and
their previous experience with
visits to archaeological
sites. These analyses show that the educational
level and the previous ex-
perience are important fac-
tors in understanding the
works of restoration. This
realization in part explains
the positive (beyond all ex-
pectation) results of the
survey. The visitors to the
Acropolis show a high ed-
cucational level and consid-
erable previous experience, a
fact that implies—among other things—an under-
standing of the aims of an
attempt at restoration and
a certain familiarity with
the limitations that a re-
soration poses.

Another important, if not
definitive, factor for un-
derstanding the results is
age. The relevant analyses
of the replies demonstrate that
the more elderly vis-
itors tend to be more satis-
fied with the work of re-
storations and the visiting
experience than the younger
visitors, who seem to have more reservations. A likely
explanation of the phenomenon is that younger
visitors, being more familiar
with the use of advanced technology, look for
the most useful is the request for the instal-
lion of fuller visual material in the archae-
ological site. Quite a few visitors noted the
lack of a general information board at the
entrance to the site, and the need for more
information on the history and architecture
of the monuments, particularly compared to
the information given about the restora-
tion project.

To end our analysis, we may say that the present
survey describes along general lines the positive
outlook of the visitors to the
work of restoration and
their wider accord
with the methods being
used. It would indeed be
groundless to assert that
this positive response is
based on an understanding
in depth of the goals and
the methods of anastelosis.
Rather, it is more expedi-
tent to interpret it as an ex-
pression of confidence and
recognition of the effort
being made by all who are
involved in the work of
anastelosis. An effort that,
because of the extent and
pace the work has assumed
during the past years, is
now particularly evident to
anyone visiting the site. In
any case, it would be no ex-
aggeration to say that in
the consciousness of the
visitor, the Acropolis works
are well worthwhile.

The case of the House of the Arrephorion
on the north side of the Acropolis next to the Circuit
Wall, was a building
which, though associated with the Circuit
Wall, was dedicated to the
loved Athena. The
preserved parts of the
building include the
foundations walls, which form two un-
dergound halls. The
dimensions of the
central hall (YT 1) are
8.30 x 2.30 sq. m and the
maximum height of the foun-
dation wall 4.90 m. The
smaller hall, that is
the porch (YT 2),
measures 8.30 x 2.30 sq. m and the
maximum height of the foundation wall 3.80 m.
The foundations walls, which are rectan-
gular blocks of poros-stone (bitter marble
limestone from Piraeus), range between
1.40 and 2.00 m in thickness.

Purpose of the backfilling
The main reason the backfilling of the
Arrephorion was considered necessary was
the continuous damage to the structural
components of the monument from the
physical and chemical action of the envi-

The backfilling of monuments is consid-
ered an intervention on ancient monuments
and therefore requires special attention. In
making the geotechnical study for backfill-
ing, the general principles of the Charter of
Venice were borne in mind. In accordance with these principles, we aimed at the following:

- Reversibility of the backfilling: the fill must be easily removable
- Preservation of the existing structural
- Longevity of the backfilling: the work has to be able to bear securely
- Stability of the existing structural mem-
bers of the monument:
The backfill must be introduced in such a way that its
charge action on the building blocks of
the monument: the backfill
must be able to bear securely
self-weight loads or
the accidental (dead-
live) loads.
- Minimalizing the load on the structural
components of the monument: the backfill
must be introduced in such way as to insign
the building blocks of the monument:
the backfill must be able to bear securely
self-weight loads or
the accidental (dead-
live) loads.
- Longevity of the backfilling: the method
of backfilling must be able to bear securely
self-weight loads or
the accidental (dead-
live) loads.
- Minimalizing the load on the structural
components of the monument: the backfill
must be introduced in such a way as to insign
the building blocks of the monument:
the backfill must be able to bear securely
self-weight loads or
the accidental (dead-
live) loads.
the case of the Arrephorion, alternate methods of backfilling were examined as a preliminary approach.

After comparative qualitative analyses, it was decided that the most suitable method of backfilling in the case of the Arrephorion is to introduce reinforced soil into the central hall and in the porch simple fill consisting of amorphous marble fragments and supplemented by suitable well graded selected granular soil. Around the edges of the monument smooth slopes were formed (with an inclination of about 50°) of well compacted gravel. The reinforced soil represents a relatively modern technique, which is already regularly used in our country – primarily in road construction – as an alternative to costly retaining walls of reinforced concrete.

From this point of view, the following advantages are assured:

- Minimal loading of the foundation walls and of the part of the Circum Wall that is in contact with the ruins from the action of horizontal thrust of the fill under static and seismic conditions.
- Facility in future removal of the fill to return the area to its former state.
- Durability of the work (at least 120 years with the endurance of the geosynthetics as criterion).
- Full analytical documentation and evaluation of the solution in static and seismic conditions.
- Short time needed for doing the work.
- Facility in implementation of construction.
- Reasonable cost of the operation.

For the design of the thickness of the soil layers of selected gravel, the required tensile strength of the geogrid for each layer, the geometric characteristics of the reinforcement and its positioning. The calculations were made for the most unfavourable contour, in which the reinforced soil has a height of vertical slope equal to 5.00 m. A lifetime of t=120 years was accepted for the backfill, based on the strength of the geosynthetics.

Examined in addition, in the framework of the geotechnical planning of the work, were subjects such as:

- Sufficient drainage of the underground areas.
- The isolation of the monument from the filling material with adequate separation geotextiles.
- Surface protection from rainwater seepage.
- Protection of the structural blocks of the Arrephorion with simple physical methods.
- The suitable choice of surface materials and geosynthetics for implementing the process of backfilling.

Examine geotechnical action: These were based on the provisions of the Greek Antiseismic Code (EAK2003) since the backfill constitutes a new construction within the monument.

In particular for the antiseismic planning of the fill:

i) The seismic loading was determined for the design. On the basis of the Code (EAK 2003) the area of the work is in a zone of seismic hazard “1”, with a seismic acceleration of A=0.16 g. The design acceleration was increased because of the importance of the work, the increased length of the lifespan of the work and because of the amplification of the acceleration due to the topographical effect of the rocky Acropolis hill. As a result, the design acceleration was determined as A=0.30 g.

ii) Calculated with well documented empirical methods were the permanent displacement of the reinforced fill under seismic conditions, shifts owing to shaking of the foundation walls, shaking of the fill and in the long run distortion of the reinforced fill through creep of the geogrid. All this showed that it was necessary to make a joint between the north foundation wall and the reinforced fill as follows: from the crest of the fill to the bottom 2 m raise b=15 cm and from a depth 2 m from the crest to the base joint b=10 cm.

The intervention

Briefly, in the framework of making the backfilling and giving functional shape to the wider environs of the area, between September 2006 and April 2007, the following works were completed:

1. A base was formed for the backfill by placing a levelling layer of selected gravel on the rock and covering it with an impermeable insulating membrane, in order to avoid seepage of local stagnant water.

2. A separation geotextile was laid as a covering for the area to be filled. The foundation walls in particular are covered with the clean sand introduced between the foundation walls and the geotextile in order to:
   a) avoid direct contact of the foundation walls with the geotextile and
   b) create a better adjustment of the geotextile against the irregular side of the foundation walls.

3. A drainage layer was placed (selected gravel with a 3% percentage of fine grains) on the separation geotextile of the floor with the slope necessary for water to flow out.

4. A drain made of pebbles (12-60 mm) with a dam, 20 cm, was constructed in the north side of the central hall and enclosed in geotextile. For the exterior run-off of the water, a perforated pipe of PVC was placed transversally at the end of the drain, with the opening of a hole in the northwest corner of the central hall.

5. A separation geotextile was placed on the upper surface of the drainage layer as protection from chance pollution from fine grains of gravel.

6. A reinforced embankment was made on the separation geotextile with successive layers of compacted select gravel (at least 95% of the modified Proctor test), 25 cm thick and geotextile. The layers of geotextile are set at intervals of 50 cm (each two layers of fill), with the main tensile strength oriented N-S. The façade of the fill is formed by a geotextile wrap-around, and the excavation of the ground material with the placing of a separation geotextile within the part of the geotextile that is wrapped around. Particularly in the areas of contact between the fill and the foundation walls light compaction was applied in order to lessen the lateral compaction pressures on the foundation walls. In the areas of contact between the reinforced fill and the north foundation wall, special arrangement was made for the construction of an antiseismic joint of gradation width with the setting of a suitable, very deformable synthetic insert of sheets of polyurethane, 5 cm in width. Special care was taken also in the areas of contact between the reinforced fill and the foundation cross-walls in the central hall, by placing supplementary perimetrical layers of geotextile so as to improve the total contribution of the reinforced fill in areas where the armature is interrupted because of the foundation cross-walls.

7. Covering the reinforced fill with separation geotextiles and then placing a sealing...
layer of surface material of low permeability comprising a mixture of argillaceous matter and pebble (so as to combine impermeability with strength); also drainage was arranged for rainwater.

8. Together with the introduction of reinforced fill in the central hall, the filling of the porch proceeded to the same height. Specifically, the porch was filled in part with the amorphous marble fragments from the removal of fill from the monument, and the rest of the empty space was filled in with select granular material. When the filling had been completed, a separation geotextile was placed on top, over which the insulating layer was spread and compressed.

9. Extension of the filling around the Arrephorion with well compressed select gravel. This perimetric fill was formed with a slope no greater than 1:2 (height: width).

10. Construction of a wall of stone masonry with mortar at the NW side of the monument at the boundary of the mediaeval stairway, to support the fill.

11. Construction of a drain around the edge at the foot of the slopes of the fill (to carry off rainwater) consisting of a pierced plastic pipe Φ 100, enclosed in a separation geotextile, with a perimetric filter of fine-grained gravel likewise surrounded on the exterior by a separation geotextile. The drain empties through an opening in the neighbouring mediaeval stairway.

12. Transportation of the piles of amorphous marble fragments from the south side of the Arrephorion to the area NW of the monument and arranging the surrounding area.

13. Making the final coating of the fill over the waterproof sealing layer (with the insertion of a geotextile) of well compressed gravel with an aggregate of a suitable colour, so as to harmonize with the surrounding archaeological site.

14. Architectural arrangement of the fill to show the plan of the buried foundation walls by means of zones of garbuglio 5 cm thick (reinforced with geogrid), of white cement and of a suitable flat colour so as to harmonize with the final surface of the fill.

15. In order to monitor the backfill, we placed the following: a) pile witnesses on the foundation, the cross-wall in the central hall and on the top of the reinforced fill, for the topographical monitoring of the reinforced fill to monitor chance horizontal pressure shifts.

During the work, in addition to continuous macroscopic monitoring, there was incessant quality control, with sufficient laboratory and field tests relating to the determination of granulometry, permeability and the compaction of granular materials.

Likewise, there was systematic documentation of the construction with the compiling of a register of the work: daybook, plans “as built”, photographs, tests of quality control, technical record, statistical entries etc., and a conservation manual of the work. Used in carrying out the construction were approximately 1200 m³ choice inert materials, such as sand, pebbles and gravel, 600 m³ geomesh, 1000 m² geotextiles, 1000 kg cement, 30 m³ timber etc. The total time for completing the project (backfilling the monument and arranging the surrounding area) was around 7 months, a very short time considering the special difficulties of carrying out the task in the archaeological site of the Acropolis. During this period the staff of the YSMA cooperated fruitfully with the contractor, particularly on moving materials and on conservation – repair of tools and machinery.

Finally, it should be noted that the backfilling of the monument has already been successfully completed (May 2007) and that the work is now in the phase of conservation by the contractor, in accordance with his obligations in the relevant contract.

In charge of the work on the Circuit Wall of the Acropolis

Dimitris N. Engleos
Civil Engineer Ph.D., Geotechnical Engineer


The temple of Athena Nike from the east. Photo S. Mavrommati, 1983

On the top of the tower that guards the Acropolis rock, the temple of Athena Nike has been undergoing anaesthesia since the year 2000. The monument, a work of the architect Kallikrates, built in the years 427-424 B.C., housed the cult statue of the goddess for the second time in the history of her sanctuary.

The tower at the southwest corner of the Acropolis, primary defensive position of the fortification wall, was already a cult site in Mycenaean times. On the occasion of dismantling the temple and the classical pyrgos, it is presented as a continuation of the victorious struggles of the city of Athens against the Giants.

The early sanctuaries
The cult of Athena Nike, continuing the religious tradition into historic times, had occupied the top of the Mycenaean tower already by the middle of the 6th century B.C. The oldest remains of that early sanctuary continued to light in the excavation of the preclassical fill within the classical pyrgos, 1.83 m lower than the level of the marble temple, are the following:

- the inscribed fragment of the earliest potos altar of the goddess (580-530 B.C.), founded or dedicated by Patroklês and
- the potos base measuring 0.96 x 1.08 x 0.41 m that held, according to most scholars, the archaic, wooden figure of the goddess (560 B.C.). The rectangular cutting in the centre of the base, which was made to hold the cult statue, was found full of clay figurines of a primitive female type (geometric – middle of the 5th century B.C.). For this reason, when it was found it was considered by those who studied it to be a boston for chthonic sacrifices.

The first stone temple
Around this base, which follows the orientation of the Mycenaean bastion, there came to light remains of a little potos shrine of ΝI-shaped plan, measuring 3.125 x 2.46 m. The building, which was the first stone temple of Athena Nike, was discovered beneath the NE section of the marble temple, together with its altar.

The placing of dedications in the rectangular cutting of the base, about which there are opposing theories, appears likely to be connected with the end of the history of the first stone temple. Perhaps the date of its construction was set again in its original place as soon as the base was housed in the first stone temple.

The marble temple
The new marble temenite, amphiprostyle, Ionic temple of Athena Nike was built in the framework of a basic renovation of the temenite of the goddess at the new level of the sanctuary, as the Mycenaean bastion was replaced by a new defensive pyrgos. It was founded further west than its predecessor with its altar precisely above the earlier potos altar. Together with the brilliantly conceived and executed marble sculptured parapet that crowns the bastion, the monument continues the tradition of being both sign and ornament of the defensive pyrgos.

For the second time it is preserved in its slightly different orientation from that of the potos base, the shrine is later than the figure that it housed. The monument incorporated the base of the cult figure in its NW corner and not on its longitudinal axis, probably because the available space on the bastion did not permit further opening of the building to the north. Scholars have various opinions about its chronology, ranging from 500 to the middle of the 5th century B.C. Yet, the form of the altar and the lack of traces of burning on its walls make it more likely to postdate the Persian invasion. It appears that the venerated figure of the goddess escaped the catastrophe of 480 B.C., because it was hidden in a safe place. Thus, it was that after the return of the Athenians, probably in Kimon's time, it was set again in its original place as soon as

The cult statue
In his first book about the Acropolis, fragments of which are preserved by the 1st century A.D. lexicographer Pausanias, the Athenian traveller Pausanias, a writer of the 2nd century B.C., applies the term xoanon to the cult statue that was in the marble temple. He reports that the god was portrayed wingless, with a chthonic symbol of fertility, the pomegranate, in her right hand, and holding in her left a helmet, symbol of war. This picture, connect-
ing the chthonian fertility nature of the goddess with her warlike aspect, shows the deity as peaceful rather than martial. Four centuries later, the evidence of Hesiodos is preserved by Pausanias, who, however, has probably taken the views of others without having actually seen the work himself. By his time the name of Athena had given way to the essential quality of Nike. The official inscriptions (IG II2, 1425) refer to the temple as the temple of Athena Nike and show that the process had already started in the 4th century B.C. The goddess is now known as the Wingless Victory, "Nike Apteros" (II, 22, 4-5) because of the absence of the wings that might have been expected on the Goddess of Victory. This representation, according to the tradition of the time of the ancient traveller, insured that the goddess would forever be beside the Athenians (3, 15, 7).
The ancient literary sources do not give a fuller picture of its appearance. Some scholars believe that the proportions of both shrine and base show that the xoanon of Athena Nike was small enough to have been removed from the Acropolis in an emergency, as was the wooden xoanon of Athena Polias. It is a fact that the measurements of the base (0.53 x 0.54m) and the form of the cutting for setting the xoanon agree as well as the standing xoanons of large size as with a seated figure of smaller dimensions. Yet, the relative depth of the cuttings (0.23 x 0.28 m) for holding the statue would appear better suited to a standing xoanon of large size.

Representations of Athena on pottery and in sculpture support the validity of Heriodorus' description, as well as the likelihood that the xoanon was a standing figure. In a relief from the Acropolis of the first half of the 4th century B.C., L. Beschi recognizes the archaic xoanon of Athena Nike in a female figure shown standing within a temple, with a table of offerings before her. The figure is behind and to the left of a seated goddess who is identified as Athena. The figure wears chiton and himation, but the way in which the figure is depicted is reminiscent of Archaic statues: she wears a polos, she is frontal and her elbows are bent with her hands outstretched and holding symbols. The symbol in her right hand could be a fruit.

Of particular importance for the history of the statue that was set up in the marble temple of Athena Nike is the decree IG I3 64 (440-415 B.C.), which refers to the announcement of a contest for undertaking some unspecified work in the framework of the building programme of the late 5th century in the temenos of Athena Nike. According to the most recent interpretation (D. Giraud, P. Schultz), the first decision of the decree refers to the choice of valuable materials – gold leaf and ivory – that were needed for the renovation of the cult statue that was housed in the new marble temple and for setting its new base. The sort of renovation that comprises its sheathing and redecorating with ivory and gold on the exposed parts was carried out as well on the archaic xoanon of Athena Polias that was housed in the Erechtheion and was dated 540 B.C. The practice was employed also for other cult statues down to the 2nd century A.D.

This interpretation is supported both by the word ἱπποπτερύς in the decree, which could refer to a barrier in the cella to safeguard the valuable cult statue or to the parapet of the pyrgos. It is supported also by the reference to participation of the Allies in the final decision, since it was a matter of using funds of the Delian League to restore an important statue of the goddess protector of the Alliance that had been saved from the Persian invasion. This participation would have been senseless if the decree had referred to the refurbishment of the doorways or construction of the coffers or acrotora of the temple, as has been suggested by a number of scholars.

The submission of a plan and the involvement of an architect mentioned in the decree is perhaps to be connected with the requirements of planning the renovation, which included the designing and setting of the new base of the xoanon, which, again in the NW corner of the area, exactly as it was in the first stone temple. These slabs are the only ones to have escaped the dismantling of the floor of the temple during the Ottoman domination, in order to construct the vault of a gunpowder storage room beneath the cella. This repetition in the second temple of the arrangement of the first is paralleled in the great temple of Hera in Samos at the end of the 6th century B.C., attributed to Polycleites. Here too...
The new educational museum kit “The Twelve Olympian Gods”

From Prehistoric times down to the pre-
dominance of Christianity in the 4th cen-
tury A.D., the Greeks, continuing with the
Romans, worshiped gods and goddesses
who, according to tradition, dwelled on
the untrodden heights of Mt. Olympus.
The religion is a complex one and it is
directly connected with a vivid mythology,
which had a role for the ancestral leaders
of the Greeks, the heroes of a shrouded but
illustrious past, and above all the places,
the mountains, rivers and seas of the Greek
world. These numberless tales with the
various versions, the myths about the
twelve immortal and most important gods,
with an entire world of lesser divinities,
provided themes that nourished and in-
spired for thousands of years both pre-
Christian antiquity and, after the European
Renaissance, poets, writers, musicians,
painters, sculptors, in sum culture itself.

With this as our theme and focusing on
the Olympian divinities shown in the
Parthenon frieze, we have prepared the
educational museum kit, “The Twelve
Olympian Gods”. It is a subject on which
we have worked for over 10 years. A first
Olympian Gods”. It is a subject on which
Parthenon frieze, we have prepared the
painters, sculptors, in sum culture itself.

The museum kit comprises various book-
lets and games.

1. The book of the museum kit

It includes an introduction to the subject. It
describes and connects the various leaflets
and games. It has instructions on how to
use them and suggestions for the instructor
divided into the following categories: Mythology-History and Art. Mythology and Language, Mythology and Natural Sciences, Mythology and Contemporary Professions. Many of these proposals have
already been applied by educators with
whom we have had a long collaboration. The museum kit “The Twelve Olympian Gods” has been designed to be used in the
classroom and then in a place of cultural
importance, thus practically anywhere. A
single work of art devoted to only a single
god is enough to activate the entire educa-
tional force of this museum kit. Information is thus given for using the
museum kit in a museum, an archaeological
site, an art gallery, a library or a bookstore.

2. A file with twelve leaflets, one for each
god

Each leaflet contains a brief description
of the characteristics of each divinity, the
most important myths about him/her, the
names of his/her companions and children,
his/her principal attributes, characteristic
features of the cult, the festivals held in his/her honour, and the main Sanctuaries and Temples dedicated to his/her name. Not-
ed less are characteristic representations of
the divinity in sculpture and vase painting
and also the identifying attributes by which
the god may be recognized; so too, the an-
imals and plants that are sacred to him/her.
One side of the leaflet has pictures only
and can serve as a mini-poster in the class-
room. The photographs are varied and they
are representative of each of the twelve
gods and goddesses. Shown in each trip-
nyx are the head of the god or goddess from
a well-known work of ancient art and smaller
copies from a piece of sculpture, a coin,
a vase with mythological scenes, an archi-
tectural work and a modern work of art.
The illustrations and painting are by
the god. On the other side of the card are shown
pictures of scenes and materials in the
ancient form.


The museum kit comprises various book-

During the past years our museum kit has
become a favorite with educators and stu-
dents. It has provided the possibility of a
multi-themed approach through the
teaching equipment. As a result it has been
included with the new school books pro-
vided for the 3rd Elementary grade as sugg-
usted by the Ministry of Education. At the same time, the
number of requests for receiving it on loan has increased in Greece and abroad for the
English version. Thus, after 10 years, and
thanks to the generous funding by the
Stavros Niarchos Foundation, we have
developed the contents and form of the
museum kit and we have brought out what
is actually a new museum kit, on the same
theme, with 500 copies in Greek and 300 in
English.


The following principles have determined
the choice of illustrative material:
- The form of the divinity on the first page
were subjects. Where possible, we have
given preference to works that are
from the Athenian Acropolis.
The principle is to emphasize the
anthropomorphism of ancient Greek reli-
gion.
- The ancient sculptural works, by
together and another with
the gods together for the cover.
- The ancient sculptural works, by
together and another with
the gods together for the cover.
b. Five game-cards illustrate works of
ancient and more recent art with represen-
tations of the gods, in sculpture, on vases,
on coins and on postage-stamps. Each card
comprises a complete educational pro-
gramme. The student identifies the divini-
ties and the myths and compares different
types of statues, vases, coins and so forth,
as follows:

Recognizing the gods… in coins
Reproduced on one side of the card are
ancient coins, two, usually different, for
each god, one showing the head and the other
showing, in most cases, the entire figure of
the divinity.

On the other side of the card are shown
coins of the 20th century and also paper
money, with representations of the ancient
gods. The students identify each god, and
they are asked to make their own collection
and to draw their own proposals for coin
design.

Recognizing the gods… on stamps
On this card are stamps with scenes de-
scribing the gods and their myths as shown
by ancient statues, vases, and coins and also by
more recent works of art by well-known
artists and modern artists, covering a chronolo-
gical span from the early Renaissance
(Sandro Botticelli, 1481) to modern times
(A. Karo, 1930).

The eleven gods are:
a. Thirteen myth-cards, wonderful works
by the painter P. Valakakis, show scenes and
myths characteristic of the gods. There is a
card for each divinity, and another with
all the gods together for the cover.

b. Five game-cards illustrate works of
ancient and more recent art with represen-
tations of the gods, in sculpture, on vases,
on coins and on postage-stamps. Each card
comprises a complete educational pro-
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the divinity.

On the other side of the card are shown
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artists and modern artists, covering a chronolo-
gical span from the early Renaissance
(Sandro Botticelli, 1481) to modern times
(A. Karo, 1930).
Greek artists. The students identify each god and create a collection of their own.

c. Two cards follow, entitled ‘Recognizing plants and animals dedicated to the gods’, by the painter, M. Kallimopoulos. Various myths from all over Greece lie behind the attributes or the predilection and relationship of each god for a specific animal or plant. The students are asked to indentify and find what is sacred to each divinity, and to pick out the corresponding myths.

d. A game-card with twelve figures-gods of different colours stimulates the children to create their own gods, to choose which colour best expresses each one, to find pictures in periodicals and newspapers, to clothe the figures and to add their attributes, and so forth.

4. An envelope containing a card on the subject of attributes and symbols. Shown are 12 attributes - forms that lend themselves to multiple interpretations. The multifacetted interpretations that each attribute to multiple interpretations. The students decode them and fill the envelope with their own objects - attributes.

5. The leaflet “The Olympian Gods in the Parthenon Frieze”

A game is devoted to the Twelve Gods as they are depicted in the frieze of the Parthenon. Information is given about the monument, and for each god an epithet and the animal and plant that are sacred to him. The students try to identify the gods and their attributes.

6. The game of recognizing the gods “Who’s Who on Mt. Olympia”

The game is based on the matching of photographs of a characteristic head, of a sculptured work, a vase, a coin, a temple, and a more recent work of art for each god. The student identifies the gods and chooses and matches the photographs of the various works.

Finally, in the museum kit the student finds also an invitation to participate in a game of finding works of art of universal cultural heritage, with the gods of Olympia as protagonists. In order to participate, the student should send us photographs of one or more works of art. The work can refer to one or more divinities, it can be an ancient or more recent piece of sculpture, vase, coin, temple or neo-classical building, or a more recent work of art or whatever else offers the possibility of being matched with the world of the ancient gods.

Special care has been devoted to the pictorial quality of the museum kit. The excellent artistic and editorial supervision of the museum kit is the work of Ina Meloglosou (AEY), to whom warm thanks are due; without her, the museum kit would not have had the same quality.

Circulation of the museum kit

From December 2006 to June 2007, 320 museum kits were given to educational institutions throughout Greece and it is estimated that some 10,000 school children will have made use of them. During the same time, around 2,000 children from 40 schools through Greece used them as material on loan.

Great interest was shown in the loan of the museum kit “The Twelve Olympian Gods” by district schools. In order to meet the demand for this circulation on a local level, a collaborative network was organized with local institutions, to which we delivered the museum kits so that they could be lent to the district schools. Thus, for each Prefecture a museum kit was sent to the local Ephorate of Prehistoric and Classical Antiquities, to the corresponding Ephorate of Byzantine Antiquities, and to Museums with organized sections of educational programmes. Likewise, for each Prefecture, our Service gave a museum kit to the Official Office of Cultural Affairs and Artistic Competitions in both the Elementary and High Schools. These kits were distributed in the course of a special seminar held in Patras in February 2007, by invitation from the Ministry of Education and the Institute of Learning of the National Centre of Public Administration and Local Government. Many of the 100 Cultural Affairs Official who took part in the Seminar, subsequently organized in their own Prefectures a similar presentation of “The Twelve Olympian Gods”, informing the educators in their district about the use and availability of the kit on loan from the local institutions.

For example, in March 2007, in Thessalonike, the four Officials in charge of Cultural Affairs in the Elementary School system of the Prefecture, in collaboration with the Tsellogleion Foundation for the Arts of the Aristotle University of Thessalonike, organized a seminar addressed by C. Hadzisalas on the subject of the Educational Material of the Acropolis, and in particular the use of the museum kit, “The Twelve Olympian Gods” in educational practice. One hundred seventy educators from 120 schools took part in the seminar, and were given an Educational Folder on the Acropolis.

The schools of the Prefecture no longer need to borrow the museum kit of “The Twelve Olympian Gods” directly from Athens. They can now receive it on loan from the institution of the Ministry of National Education and Religion (four Cultural Officials of the Elementary School system and four of the High School system), from the institutions responsible at the Ministry of Culture (16th EPKA, 9th EBA, Archaeological Museum and Museum of Byzantine Culture), and from the Tsellogleion Foundation of Arts and the Museum of Arts of the Archaeology Department of the Aristotle University of Thessalonike.

In closing we should like to thank particularly the Stavros Niarchos Foundation, whose generous funding completed first the museum kit “Let’s go to the Acropolis” in 2002, and now the museum kit “The Twelve Olympian Gods”. Officials from abroad have shown special interest in the museum kit. Museum kits have been presented to 37 Foreign Archaeological Schools in Athens. They have also been given to educators from schools abroad with whom we have worked during this period. Thus, in a first phase, museum kits have been given to 33 institutions in Australia, France, Germany, United States, Spain, Italy, Lithuania, Great Britain, Holland, Poland, Romania and Turkey. We expect the sending of museum kits to selected institutions in Greece and abroad to have been completed in December 2007.


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From July 2006 until now, much activity has gone into informing the general public as well as specialists about the restoration of the Acropolis and generally about the work of the YSMA.

**Educational activities**

The Information and Education Department of the YSMA carried out a programme on the theme “Let’s Go to the Acropolis” at the Centre for Acropolis Studies for 2,100 school children. Yet, another year saw collaboration of the Department with the Greek Parliament, with 875 pupils, 23 of them from remote Gymnasia in the Evros region (for example, the 19th and 25th Gyms of Kastoria), receiving a booklet “Let’s Go to the Acropolis” at the Centre for Acropolis Studies. The gathering was greeted at the Thessalonike Harbour by the Director of YSMA, C. Hadzi-askali, who gave an analytical presentation of the museum kit.

Likewise, in 2006, it is estimated that a total of 14,196 school children from 266 schools worked with the Department’s museum kits. This year, these museum kits were used by 10,780 school children from 86 schools, and the museum kits from the booklet “Let’s Go to the Acropolis” in hand. All the Gymnasia that took part in the programme of the Parliament received a folder containing educational material for their libraries.

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In October 2006, M. Ioannidou spoke about the Acropolis works at an event organized by the Association of Friends of the Acropolis at the Centre for Acropolis Studies. She also took part in a Day Conference organized by the Association of Friends of the Acropolis in Athens, in April 2007, by the Technical Chamber of Greece, with a report entitled “Antiseismic protection of ancient monuments: the case of the Acropolis”.

E. Tsombakari, structural engineer in the restoration project of the Parthenon, gave reports on subjects relevant to her specialty. Among those who gave talks about him were the President of the ESMA, Ch. Boukas, the Director of the YSMA, M. Ioannidou, the head of the Section of Conservation, E. Papakonstantinou-Zoiti, the President of the EFA, M. Nisadas, colleagues of the late professor at the National Technical University of Athens, students and friends and also his widow, the painter A. Venieris Skoulikidi. Foreign colleagues in his field also spoke: M. Laurenzi Tabasso and L. Lazarni. Shown during the event were sections from the television programme “Night Visitor” that were dedicated to T. Skoulikidis.

Visits
On 29 September 2006, the President of the Hellenic Republic, K. Papoulias, accompanied by the Minister of Culture, G. Voulgarakis, visited the works on the Acropolis monuments. They saw the various work-sites of the monuments and were guided by those responsible for the works. At the Propylaea they watched the setting on the monument of the new capitals on the easternmost Ionic columns in the west hall of the central building.

New publication
An elegant publication, in both Greek and English, was added in June 2007 to the list of publications on the Acropolis works. This is the “Restoration of the Propylaea of the Athenian Acropolis”, by M. Ioannidou, in the series “Ergon”, Publications of Architectural Books.

In November 2006, the Association of the Universities of Ohio and of Arizona in the restoration works of the Acropolis at Chou-Tufano, gave a number of talks on the “Restoration of the Propylaea of the Athenian Acropolis” by M. Ioannidou and in this work the methodology, which later became the established one for all the Acropolis interventions, was applied for the first time. The process comprises dismantling the parts of the monuments already restored in the past, including some parts theoretically “never disturbed”, in which there are serious problems of cracking and fragmentation, in the conservation of the dismantled members on the ground, in their re-assembling on the monument, if possible in their original positions, in the transferring of the architectural sculptures (in the case of the Acropolis of the Caryatids) to the Acropolis Museum and in their replacement on the monument by casts made in artificial stone.

Looking at this first assistance intervention of the Acropolis Committee after 20 years, with the experienced eye gained thus far, we see many points of interest.

1. First of all, this is the first time in the long history of monumental restoration in Greece that a multidisciplinary comprehensive study is published prior to any intervention on a monument. It is the “Study for the Restoration of the Erechtheion”, published in December 1977, a collective work by the young scholars working then in the Acropolis, in which the problems of the monument are examined from every point of view, archaeological and architectural, structural, physical and chemical, and precise ways of dealing with them are proposed. Another innovative feature of the study is that the theoretical principles guiding the programmed restoration are stated as well. The procedures that followed the publication of the study were still more pioneering: it was submitted to successive assessments first by the Acropolis Committee itself, secondly by experts from all over the world during the “International Meeting for the Restoration of the Erechtheion” held in Athens in December 1977 and, finally, by the members of the Central Archaeological Council of the Hellenic Ministry of Culture, which is responsible for all final decisions of intervention on the monuments. This multiple sequence of assessment, discussion and approval was aimed at guaranteeing the greatest possible objectivity in the decisions.

Twelve years have passed since the restoration of the Erechtheion was completed (1979-1987). It was the first intervention carried out on a monument of the Acropolis by the ESMA and in this work the methodology, which later became the established one for all the Acropolis interventions, was applied for the first time. The process comprises dismantling the parts of the monuments already restored in the past, including some parts theoretically “never disturbed”, in which there are serious problems of cracking and fragmentation, in the conservation of the dismantled members on the ground, in their re-assembling on the monument, if possible in their original positions, in the transferring of the architectural sculptures (in the case of the Acropolis of the Caryatids) to the Acropolis Museum and in their replacement on the monument by casts made in artificial stone.

The restoration of the Erechtheion: 20 years later

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The Acropolis Museum. September 2006

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with a 5- and 3-ton lifting capacity, had been installed in the north porch. (It is indicative that as the lifting capacity of these bridge cranes was not sufficient for hoisting the marble beams of the north porch, each weighing 8.5 tons, the beams, which were broken in two pieces, had been secured in situ, on the monument rather than on the ground). The bridge cranes and the winches suspended from them were all manually operated (the Acropolis Committee excluded installation of a slewing crane had not been considered (the Acropolis Committee excluded). Yet, this intervention was limited to the ceiling and did not extend below to the parts of the columns previously restored. These were preserved in very good condition (the beams, which were broken in two

The beams from which the marble beams of the north porch had been suspended were all manually operated (the Acropolis Committee excluded intervention for the first time on a section of the monument that had never been dismantled, with no sign of rusting or intervention of the ceiling beams of the north porch had been suspended. This pioneering use of titanium in the restoration of a monument, visualized since the beginning, for replacing the metallic elements of the previous interventions, including clamps, dowels and the larger metallic reinforcements, was also studied. In the case of the ceiling beams of the north porch, which had been mutilated by the Lord Elgin’s activity. Established during the course of the work was the material used for the ceiling beams: artificial stone for the replacement of architectural members preserved outside the monument (as, for ex., of the NE column preserved in the British Museum), natural stone, identical to the one used in the initial construction, for replacing architectural members that had definitively been lost (such as the northern block of the east frieze or the NE cornice block).

4. The restoration of the Erechtheion saw the first application and testing of the materials and the techniques of intervention, which were later to become standard in the Acropolis restoration project. We shall look at some examples.

- First of all, this was the first use, internationally, of titanium in the restoration of a monument. Titanium was employed for joining together either fragments of the ancient members, or for joining new marble fillings with the ancient members, for replacing the metallic elements of the previous interventions, including clamps, dowels and the larger metallic reinforcements, such as the metallic structure inserted in the interior of the architraves of the porch of the Caryatids or the big iron beams from which the marble beams of the ceiling of the north porch had been suspended. This pioneering use of titanium led to a faithful repetition of the solutions set forth by Balanos, especially for structural reinforcement, although these solutions were technologically behind the times and did not take full advantage of the potentialities of the new material. This is particularly valid for the structural restoration of the ceiling beams of the north porch. In similar cases later on, such as the structural restoration of the ceiling beams of the central building of the Propylaia, more technologically advanced solutions were adopted, which are more compatible with the potentialities of titanium. As for the new structural reinforcement of the Caryatids’ porch, it is identical to the older one (a Π-shaped titanium structure set in the interior of the architraves of the porch, with vertical supports that transfer the weight of the ceiling to the podium, thus relieving the statures of the Caryatids), with the sole difference that the upright reinforcements are now concealed inside the casings of the Caryatids. This has improved the appearance of the porch, since the vertical supports were visible in Balanos’ intervention, between the statues. An identical titanium bar replaced as well the older iron one above and along the architrave of the west wall of the Erechtheion. Behind the lintel of the north entrance, however, a sole titanium beam has replaced the two iron beams set there during Balanos’ restoration.

- For joining the members new titanium clamps and dowels have been used. The horizontal clamps are of various dimensions and shapes, double T-shaped (of various sizes), Π-shaped or of special profiles, designed ad hoc (these replace joining elements of four types: the ancient ones, those of Roman times, those of Pitsikas’ restoration of the middle of the 19th c. and those of Balanos’ intervention at the beginning of the 20th c.). In order to avoid further cutting of the ancient pieces, the extraneous sockets (the cavities that receive the clamps and dowels) have been in the new restoration, with the insertion, in each case, of the suitable joining element. The profiles of the new joining elements and their proportion in relation to the size of the sockets and the thickness of the cement compound of special composition introduced around them (the new titanium joining elements are sheathed in cement mortar and not in lead, as in antiquity) have been carefully studied during their fabrication and placement in the monument. All these technological applications were completely original at that time, and the goal was to restore the best behavior of the joining elements in case of charging. The composition of the cement compound around the joining elements has also been specially studied. In the lower courses of the Erechtheion wall a cement compound has been used that is richer in Portland Cement in proportion to silica sand. In the upper courses, the composition of the cement compound used was exactly the opposite, for the same reason: the reduction in height of the resistance of the cement compound entails a bigger elasticity and freedom in the movement of the walls in case of charging.

- In the present restoration of the Erechtheion those restoration practices of Balanos that are contrary to today’s restoration ethics, have been dealt with for the first time. These are the erroneous and random positioning of the monument’s architectural members in their re-assembly and the practice of creating architectural blocks by “stitching them together” from various ancient fragments of different origins. In 1982, C. Zambas, the civil engineer in charge of the restoration, first systematically investigated, with the aid, indeed, of a P.C., the electrical movement of the hoisting machinery, in order to better control the movements and operations. In general, the Acropolis Committee of that period was cautious about the use of modern technology in the interventions. Moreover, the installation of a wooden scaffolding instead of the bridge cranes had initially been considered (the installation of a scaffolding crane had not been considered at all by the Acropolis Committee members, being a priori excluded). Yet, these conditions for the execution of the work lent the Erechtheion restoration a manual quality, and connected it directly to age-old traditions and practices.

3. The intervention in the Erechtheion began –and largely remained– as a strictly rescue operation. The initial programme of the work, closely attached to the relevant theoretical principles adopted by the Acropolis Committee, comprised the dismantling and restoration only of those parts of the monument, that had been restored in the past, even excluding some of them. In the north porch, for example, the intervention was limited to the ceiling and did not extend below to the parts of the columns previously restored. These were preserved in very good condition (the monument rather than on the ground). The bridge cranes and the winches suspended from them were all manually operated (the Acropolis Committee excluded the beams, which were broken in two pieces, had been secured in situ, on the monument rather than on the ground). The bridge cranes and the winches suspended from them were all manually operated (the Acropolis Committee excluded intervention for the first time on a section of the monument that had never been dismantled, with no sign of rusting or intervention of the ceiling beams of the north porch, which had been mutilated by the Lord Elgin’s activity. Established during the course of the work was the material used for the ceiling beams: artificial stone for the replacement of architectural members preserved outside the monument (as, for ex., of the NE column preserved in the British Museum), natural stone, identical to the one used in the initial construction, for replacing architectural members that had definitively been lost (such as the northern block of the east frieze or the NE cornice block).

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3. The intervention in the Erechtheion began –and largely remained– as a strictly
correct positions of the blocks of the south wall of the monument. This study, pioneering in its time, opened the way for research in that direction and invented the relevant methodology. In 1985, the corresponding study for resetting the blocks of the north wall was made by A. Papanikolaou, the architect in charge and director of the whole restoration operation of the Erechtheion. In this way, the lateral walls of the cells of the monument recaptured to a significant degree, in their new restoration, their original structure and their original structural inclinations (during the re-assembly, 25 blocks of the north wall, that had been used for the restoration of the south wall, returned to their original position; 6 blocks of the south wall took the opposite route). The gaps that resulted from repositioning the members have been filled with completely new blocks of new Pentelic marble. Furthermore, through the repositioning of the blocks in their original places, it became possible to recapture and reuse the original sockets of the joining elements. In some cases, the edges of the sockets had been destroyed in the past with the violent extraction of the metallic joining elements; these had to be filled in new marble in order to ameliorate their structural capacity. Depending on the individual case, the surface of the new stone was given a final or semi-final treatment to harmonize better with the adjacent ancient blocks. Likewise, both for stability and for didactic considerations, part of the inner, transverse wall of the monument was restored.

Many are those who contributed to the restoration of the Erechtheion. In this brief article only a few could be mentioned:

First of all the three founding members of ESMA, Charalampos Bouras, Sokratis Angélidis and the late Theodore Skouli-

kids, who had guided and supervised the inexperienced young scholars at the beginning of the works, established the procedures of studying and decision taking, formulated and defined the theoretical principles and the methodology of the interventions, the choice of materials and the application techniques.

Secondly, the engineers in charge of the work, Alecos Papanikolaou and Costas Zambas. Despite their youth, in an exemplary harmony and collaboration they handled all the problems that emerged and brought to completion an operation, that was pioneering in its time.

Finally, the most valuable contributors: the marble technicians. In the restoration of the Erechtheion three generations of marble technicians have worked: some old technicians who had worked under A. Orlandos, in the large scale restorations of the period 1960-1970. These had returned to the Archaeological Service – among them Nikolaos Skarris, son of Evangelos, the former of the crew, was distinguished for his character and above all for his incomparable skill; some younger, but experienced technicians, who had occasionally worked on monuments, finally young technicians, who had just finished the Technical School of Tinos island. These are the foremen of today.

The sudden and unexpected loss of A Papanikolaou in 1998 left unfinished the text of the final report on the work. In completion and editing was undertaken by the personnel of the Documentation Office of the YSMA in collaboration with the President of ESMA Prof. Emeritus Ch. Botsas. The work is almost completed and its publication is scheduled for the end of the current year. Thus, 20 years later, the work of the restoration of the Erechtheion will become known. It will be rendered to the community as a whole, experts and non-experts, in a spirit that is fully in accord with the international ethos of restoration.
The restoration and conservation works of the Acropolis Monuments as well as the present issue are jointly financed by the European Union.

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