

The **monuments of the Athenian Acropolis** interest both the Greeks and the international public. It is therefore taken for granted that we should preserve them and highlight them. The temples on the Acropolis Rock are not simply part of the architectural heritage of the modern Greeks; they are much more. They hold a unique significance for western civilisation because they were the ideal architectural models both during antiquity and in the post-Renaissance era. They are the evidence of a cultural apogee that humanity has very seldom known.

The intentions of those who built the Parthenon, the Propylaia, the Erechtheion and the temple of Athena Nike are well known: They were built for the gods – perfect in terms of harmony and art. They were built for the ages – perfect as constructions. They were built for the prestige of the city-state – at an impressive scale with a wealth of decoration.

The confluence of many factors in the 5th century B.C. brought Athens a cultural climax without precedent. Democratic institutions, social cohesion, a vibrant economy, an influx of metic marble workers from the Aegean islands and the presence of talented architects and sculptors combined with a zenith in other arts and crafts, as well as in politics, philosophy and theatre, created this cultural culmination.

The responsibility for preserving, managing and presenting the monuments of the classical period is tremendous.

In 1975, under the initiative of Prime Minister Constantine Karamanlis and Minister of Culture Konstantinos Trypanis, the Committee for the Conservation of the Acropolis Monuments (ESMA) was constituted and has been responsible for studies and works on the Acropolis monuments since then. In 1975 the error made in the earlier restorations under the programs of Nikolaos Balanos, which was the execution of the work by only one person, was not repeated. On the contrary, a multidisciplinary committee and a system for double-checking its decisions were set up. ESMA is indeed multidisciplinary, with archaeologists, architects, civil engineers, material conservation chemists and conservators all participating in its work. The studies are supervised by ESMA and the Central Archaeological Council and are published to the international community of experts at international meetings convened to this end.

In 1999 the Technical Office of ESMA was transformed into an autonomous service with the aim of accelerating and completing the projects. The Acropolis Restoration Service (YSMA) provides a comprehensive system of administrative and financial services under its own Director.



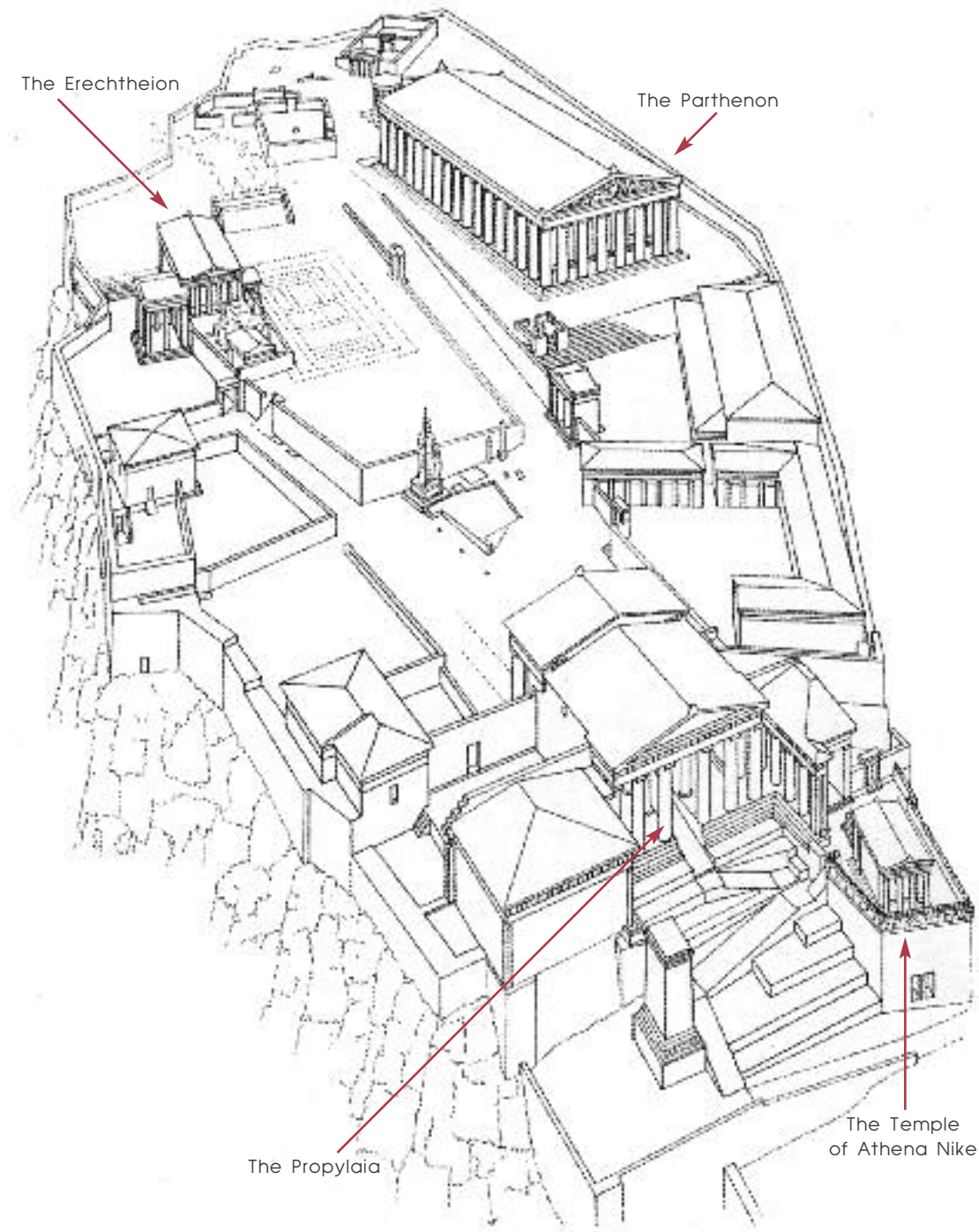


The conservation and restoration of our architectural heritage, comprised of ancient and historical monuments and sites, is considered self-evident in the modern world. The preservation of cultural assets that also belong to the built environment constitutes a cultural activity in itself.

It is apparent that in recent years appreciation of this cultural wealth is continuously on the rise and endeavours to preserve and promote it are multiplying in the same way as those that focus on the natural environment. This is because in both cases the objective is quality of life.

The preservation of old and historic buildings in cities or regions threatened by the spread of a formless, standardised and industrialised new architecture, is a kind of resistance against the levelling and homogenisation of our daily lives. Diversity and history bear a direct relationship to quality of life, as well as to the identity of a city, region or country.

The endeavour to preserve cultural heritage requires special care and funds, as well as expert and experienced administrators. The restoration of monuments is based on a multidisciplinary approach. It aims to retain their values unchanged, to protect them from the wear and tear of time and to retain a form that expresses the spirit of their era. All these issues have been addressed theoretically in Europe since the early 19th century and have been tested in hundreds of cases so that today we have evaluation systems and work methods that meet with general acceptance.



Drawing by G. Stevens

The following case types can be identified:

- a) **Rescue interventions**, such as consolidation, structural restorations or removal of art works from the monument as a last resort for their preservation
- b) **Conservation interventions** both for the monuments themselves and for their proper use and
- c) **Interventions to enhance their values**, such as restoration and possibly partial reconstruction and landscaping.

Experience has shown that the preservation of all the values expressed by a monument requires minimal interventions as well as their maximum possible restriction. It has also shown that it is based on knowledge. On the one hand, the architects handling the project should study the monument itself – its history, its materials and the reasons that necessitate intervention. On the other hand the community must accept this intervention, on the basis of its education and direct information about the specific project, as well as the cost of its realisation.

In Greece and the countries around the Mediterranean in particular, many monuments of antiquity have been preserved. These are the visible remains of a great civilisation that was revived during the Renaissance and became the basis of modern Western civilisation. These ancient monuments, with the exception, perhaps, of the theatres, have lost their original function and their only “function” today is as exhibits. During interventions undertaken on them, there must be a balance between the two requirements – to retain, on the one hand, the vestiges of their historical adventures and their ruinous character and, on the other hand, to improve their form in order to highlight their original artistic value as much as possible. It is obvious that this balance is not easily achieved and that it differs from monument to monument.



The misfortunes of time over a period of 2500 years were responsible for the continuous deterioration of the monuments of the Athenian Acropolis. Whatever the monuments suffered, however, is due more to the actions of people and less to the forces of nature.

The major causes of the damage are:

- Fire and vandalism to the Parthenon in late antiquity. Poorly executed repairs later on.
- Conversion of the Parthenon and the Erechtheion to churches, in the 6th century. Impact of the new function.
- Conversion of the Propylaia to a Bishop's residence and later to a fortified palace.
- Conversion of the Parthenon to an Ottoman mosque in 1458.
- Gunpowder explosion in the Propylaia in 1687.
- Demolition of the temple of Athena Nike for the creation of a bastion in 1687.
- Explosion of a gunpowder store in the Parthenon during the 2nd Ottoman-Venetian War, in 1687.
- Looting of sculptures by Lord Elgin, 1801-1804.
- Damage during the Greek War of Independence due to bombardment and looting of metals.
- Failures of the 1896-1940 restoration programs.

From the time of Pericles to the present day, there has never been systematic conservation and consolidation of the monuments. It should also be noted that the interventions of the 19th and early 20th centuries had as their aim, aesthetic restoration and reconstruction, rather than the conservation and consolidation of the monuments. Many of the problems faced today on the Acropolis are due in large degree to the **failure of the interventions between 1896 and 1940**, for which N. Balanos was responsible. The failure is due to the widespread use of iron in the restoration work. Beams, fasteners, connecting elements and so on, made of ordinary commercial iron, were used and were incorporated with the aid of plain cement into the ancient marble architectural members, which were chiselled wherever convenient.

The results were disastrous: oxidation and subsequent expansion of the iron elements resulting in the fracturing of the marble into which they had been incorporated. During the 1960s, the damage was visible everywhere, with fractures to the marble and pieces falling off. The Balanos restorations were considered very good in terms of

aesthetics and completion of the continuity of the forms, but proved disastrous in terms of construction. Where were these carried out?

**The Propylaia:** The east porch and the marble coffered ceilings of the central building.

**The Erechtheion:** The ceilings of both porches, the Caryatids and the north porch, as well as the side walls.

**The Parthenon:** The two narrow façades of the temple, a large part of the north colonnade, the inner west porch and two walls of the cella.

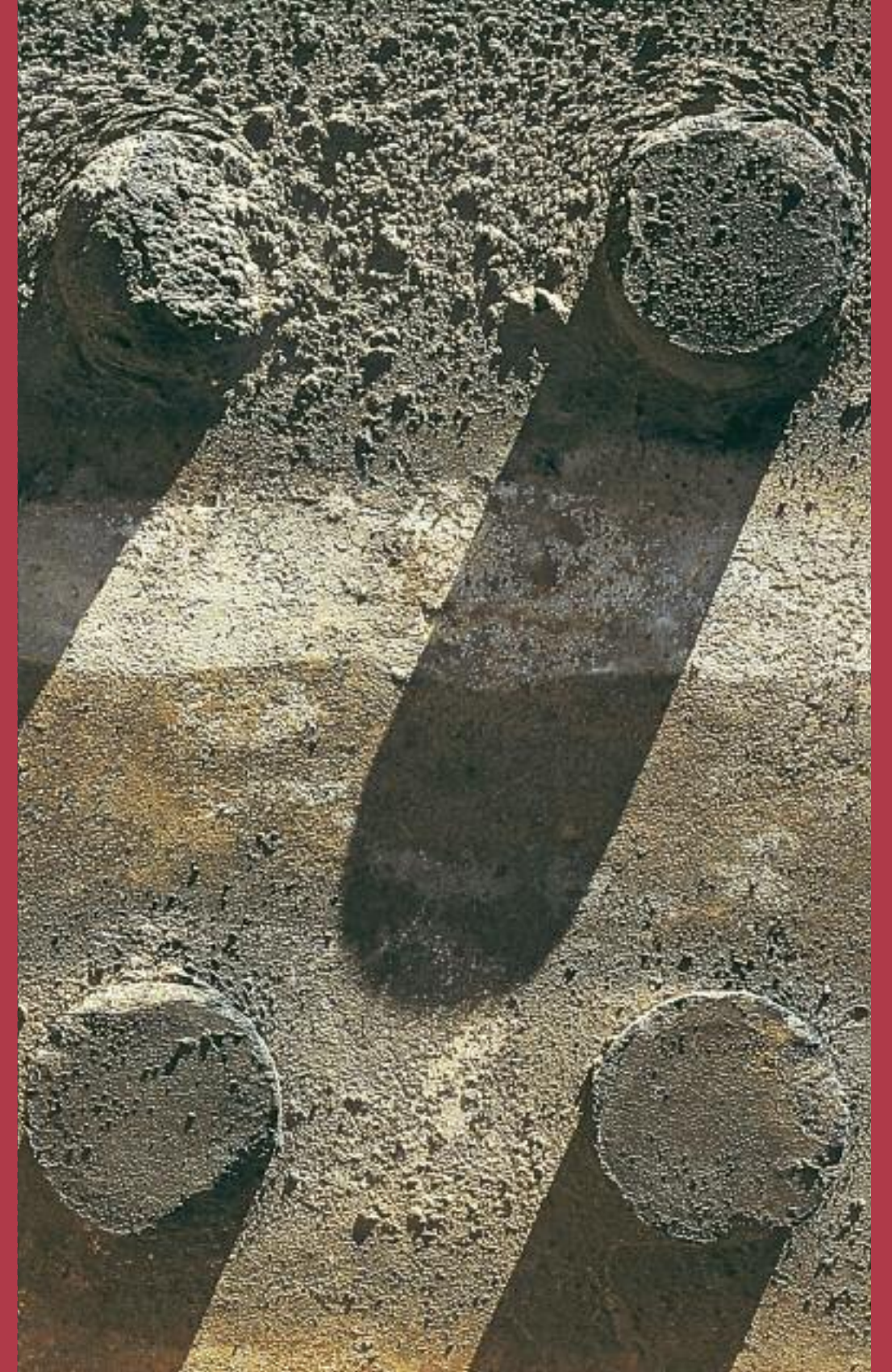
During the 1960s however, there appeared a new factor in the rapid deterioration of the monuments. This was the city's **atmospheric pollution** which, in combination with moisture, began to affect the marble surfaces and transform them slowly into soluble gypsum. This created an immediate danger to the sculptures that adorn the monuments and to the inscriptions that remained in the open air.

All these factors led to the need for intervention on all four of the Acropolis monuments. The removal of the rusted iron from the old restorations and the transfer of the sculptures to the enclosed space of the Museum for their protection became a pressing duty. These actions were followed firstly by the use of new supports and connecting elements in a non-corrosive metal, titanium, and secondly, the addition of copies made from artificial stone, in the place of the original sculptures.

During the intervention, however, the ancient monuments' many other requirements were revealed: there were multiple fractures in many architectural members due to past fires, earthquakes, explosions and bombardments. Many architectural members had also been wrongly positioned, the result of the works between 1896 and 1940, during which Balanos placed similar members in random positions for the sake of convenience.

During the preparation of the studies it became clear that this was a unique opportunity to undertake the first systematic conservation of the monuments and to concurrently advance their restoration, that is, to reintegrate architectural members (or parts of them) hitherto lying on the ground, into the four monuments. The rescue works were thus combined with other works, which aimed to enhance the entire Acropolis complex.

Crusts. Recrystallisation combined with air pollution.







Expansion of cracks due to frost.



Corrosion of marble due to microorganisms.



Displacement of the drums of a Parthenon column due to an earthquake.



Thermal fracture to a column from the pronaos of the Parthenon.



Expansion of cracks due to parasitic vegetation.



Pigeon droppings.



Pitting erosion.



Marks from the violent hacking of the figures on metope 10 of the Parthenon, a result of fanaticism against the ancient religion.



Traces from cannon balls and bullets on a column on the west side of the Parthenon.



Marble cracks due to the swelling of iron elements. (YSMA Archive)



Traces of a medieval inscription.



Marks from the forcible extraction of lead for the production of bullets.



Surface created by the sawing of stone from the Parthenon frieze by Lord Elgin's workmen.



Marble "sugaring".



Various deposits, a result of atmospheric pollution. Marble crystals that have lost their cohesion and form a darkened crust due to soot and dust can be discerned.



Poor reuse of ancient members. Four sections of different column capitals combined to form one. (T.T.)



The principles of the Acropolis restoration works were formulated as early as 1975, and are based on the values which we attribute to ancient and historic buildings as cultural assets.

The **Venice Charter** ([http://www.icomos.org/charters/venice\\_e.pdf](http://www.icomos.org/charters/venice_e.pdf)) is an internationally recognised document of conduct respected by almost all countries from 1964 to today. The articles of the Charter ensure the preservation of the **values** that we recognise in monuments, both in their management and also during interventions on them for their restoration, preservation, and anastylosis.

Buildings protected by law, as **cultural assets**, possess **artistic value** – something self-evident with regard to the Acropolis – which cannot be compromised. However, they are also buildings with **historical and scientific value**, that is, they comprise evidence of history. They are a testament not only of the period they were constructed, but of all periods following. Even the destruction and deterioration they have been subjected to, have historical value as they testify to the adventures of the monuments through the ages.

**Functional values**, serving the present needs of society, are also respected. Today, the sole function of the Acropolis in particular, is as an exhibit; we should regard this term in a very broad sense.

In terms of **environmental values** we need to view the Acropolis Rock and its monuments as a valuable feature of the Athenian urban landscape.

In terms of **emotional values** we should consider those special relationships that connect the Acropolis monuments with most Greeks' sense of national identity.

All of the above are covered by the Venice Charter and concern our entire historical and cultural built environment. However, in the case of the exceptionally valuable monuments of the Acropolis, ESMA established, in 1975, certain additional principles that are applicable only to ancient Greek monuments constructed of carved stone or marble, and with which, to date, it has complied rigorously and consistently.

a. **Reversibility**. In other words, the possibility of returning the monument (or a section of the monument) to the state it was in before our intervention. This is achieved in two ways: firstly, with respect for the ancient matter and secondly, with systematic documentation before and during the intervention.

Indeed, in contrast with the “Balanos way”, an ancient member is never chiselled, and the small sockets that are absolutely necessary for the titanium connecting elements are limited exclusively to cracked surfaces; they are never made on ancient carved surfaces. A special technique was introduced in such cases when new marble was to be fitted to mutilated marble architectural members (see leaflet no. 4). The documentation, which includes accurate drawings and photographs of the members before, during and after each intervention allows not only for control of the project but also for historically valuable research regarding members integrated into the final complete form of the monument.

b. **Respect for the self-sufficiency and structural role of each architectural member**. During the intervention, all marble members are considered autonomous works of art and are restored, where necessary, in order that they may reassume their initial structural role and their initial strength within the overall construction. Based on this principle, of course, all misplacements of architectural members that had occurred in earlier restorations (such as the blocks of the Erechtheion's side walls) are now being corrected.

c. **Limitation of the interventions to the absolutely necessary**. In no way do we wish to reconstruct sections of the monuments that have been destroyed. The additions of new marble or entire new architectural members take place only when necessary to consolidate or support original ancient members. The monuments retain their ruinous character which testifies to their historical journey, but at the same time their readability is discreetly improved.

d. **Transparency**. In line with current international principles, all public projects must be accessible to citizens. In particular, works related to the conservation and display of cultural assets, such as ancient and historical monuments which are of special interest, must be presented to the public in every possible way. The Committee for the Conservation of the Acropolis Monuments and the Acropolis Restoration Service have addressed this general, modern requirement to make its work public, through publications, newsletters, exhibitions, films and educational programs, and mainly through the international meetings of experts which it has convened.

The Doric columns of the Parthenon showing gradation of the shadows in their fluting. A testament to their artistic values.







The Acropolis as a cultural asset of worldwide fame, receives thousands of visitors daily.



The Acropolis and its Museum viewed from the south, as elements of Attica's built environment.



Byzantine inscription of the 12th century. Historical testament of the Acropolis during the Byzantine period.



The Greek flag on the Acropolis connects its monuments with the feelings of Greeks for their country. (T.S.)



Documentation.  
Systematic measurements and photographs of the monuments are taken before every intervention.



Reversibility. Using appropriate technical methods fragmented ancient marble and supplements are joined together without necessitating any chiselling.



The south side of the Erechtheion. Correction of earlier misplacement of wall blocks, with the addition of new marble where necessary.



The north side of the Erechtheion. Limitation of the addition of new marble to the absolutely necessary.



Transparency of the activities. Publication of studies relating to the restoration and publications intended for public information and education. (T.S.)



The characteristic construction and structure of ancient buildings forms the basis of the restoration works.

These buildings, regardless of size, have been constructed of marble carved into discrete architectural members, without the use of mortar. The strength of the building is due to the perfect contact between the members, and to small iron connecting elements which did not rust due to the use of lead sheathing (whereby molten lead was cast between the connecting element and the stone). This system gives them significant resistance to earthquakes.

By group (column drums, architraves, cornices and so on) these members appear similar, but in reality they have slight differences in size and cuttings in different positions for anchoring the connecting elements. These few details allow us to determine the original position of both the members that have fallen down and the members that have been misplaced, without the possibility of error. The architect responsible for the project needs to take measurements of great precision and be familiar with the ancient “syntax” of the structure of the architectural members.

The main **types** of intervention used in the Acropolis works are:

**Structural restoration** which aims, on the one hand, to restore the architectural members to their original strength and, on the other, to restore the structural relationships between them, in particular the perfect beddings that ensured the cohesion of the whole. During structural restoration, sections of the monument are dismantled, any rusted iron elements from the earlier restorations are removed, and fragmented members are joined together while certain of these are supplemented with new marble. The supplements, the marble “copies” of a lost architectural member, are created by making a cast in marble with the aid of a pointing device or automatically with a sculpture copying machine. The fragments are joined together using titanium rods in places that are not visible. All the members are then reassembled without mortar, with the aid of titanium connecting elements.

**Conservation of the surface** of the stone is usually mild in nature and is designed to inhibit deterioration due to environmental conditions as well as to repair surface damage. It involves sealing of small cracks, removal of pollutants, recrystallisation and organic deposits using modern laser technology, and bonding of chips and microcracks. For ancient monuments in particular, conservation of the surface must be continuous.

The **method** followed during interventions on the monuments has been formulated internationally. We usually distinguish the following stages:

- **Documentation:** Documentation collects, classifies and stores all kinds of information about the monuments, their history and the interventions

conducted on them. Modern computer technology provided a strong stimulus to documentation through the possibility of performing immediate searches and combining information. A database was created on the Acropolis where drawings and photographs were entered, as well as all documents relating to the works of the last thirty years.

- **Pathology:** Analysis of the factors that caused the damage or deterioration.

- **Research:** Undertaken where the original form and the causes of the problems are not immediately visible. New ways to treat them are sought and other similar cases are studied. Members, or fragments of members, lying on the ground are studied and joined with others that belong together.

- **Proposals:** Proposals are formulated using drawings, reports and research findings. They include time schedules, budgets and proposals regarding required infrastructure and personnel.

- **Proposal approval:** Approval is granted by statutory bodies comprised of experts, aiming to limit, as far as possible, the errors that can be made by a single researcher.

- **Execution of the project:** This also includes documentation of its intermediate stages. It is divided into programs that can run in parallel.

- **Self-protection and ongoing care of the monuments and site,** after completion of the project.

- **Writing and publication of a scientific report on the project,** also after its completion.

The **ways** in which interventions, whether mild or drastic, are carried out, are many. As a rule the same technology as that of the monument is employed and the materials are compatible with the original. At the same time, however, modern technology is used for the surface conservation of the marble, and also for the infrastructure of the work.

The Acropolis has an electromechanical team that designs, installs, maintains and repairs the mechanical equipment used in the restoration interventions (hoisting and transportation machines, marble cutting machines), the portable power tools used in the works, and the infrastructure networks.

Among the machinery used to facilitate the execution of the works and improve the pace of work are: bridge cranes, rotating cranes, suspension cramps and others. Many new machines and devices were created by the YSMA staff especially for the works, including equipment such as special platforms for joining together architectural members, a special marble cutter to create the fluting in the column drums, and a drill for making holes, that ends in a point and functions as a pantograph.

Supplement of new marble in a Parthenon architrave. The year of intervention (2003) can be seen, inscribed on a non-visible surface.







Dismantling the Parthenon's northeast sima with one of the lion-head pseudo-spouts.



Resetting the cornice of the Parthenon's east side.



Supplement of architectural members with new marble.



Details of blocks III and VIII from the west frieze during conservation and cleaning using laser technique.



Cleaning of the west frieze in the laboratory using laser technique. (T.S.)



Mechanical cleaning of a marble surface.



Process of joining internal cracks. Tube system in a column of the Parthenon opisthonaos, for injections of stabilising compound.



The hoisting crane at the SE corner of the Acropolis.



Bridge crane on ground level rails at the Propylaia work-site.



Suspension cramps for architectural members.



The rotating construction crane on the north side of the Parthenon.



Cutter for carving column flutes.



Pantograph for carving copies of architectural members.



## RESTORATION AND VOCATIONAL EDUCATION

The Acropolis monuments restoration project is currently being carried out by the Acropolis Restoration Service (YSMA), with employees from various disciplines: archaeologists, architects, civil and chemical engineers, conservators, electricians, administrative personnel, information technology professionals, mould makers and casters, designers, photographers, and stone masons, who comprise the largest professional group.

Discuss these professions. Following the discussion, study the following excerpt from Plutarch (Pericles, XII, 2nd cent.), which describes the skills of the people who were employed on the construction of these major works at the time of Pericles:

*The materials to be used were stone, bronze, ivory, gold, ebony, and cypress-wood; the arts which should elaborate and work up these materials were those of carpenter, moulder, bronze-smith, stone-cutter, dyer, worker in gold and ivory, painter, embroiderer, embosser, to say nothing of the forwarders and furnishers of the material, such as factors, sailors and pilots by sea, and, by land, wagon-makers, trainers of yoked beasts, and drivers. There were also rope-makers, weavers, leather-workers, road-builders, and miners. And since each particular art, like a general with the army under his separate command, kept its own throng of unskilled and untrained labourers in compact array, to be as instrument unto player and as body unto soul in subordinate service, it came to pass that for every age, almost, and every capacity the city's great abundance was distributed and scattered abroad by such demands.*

(Translation published in Vol. III of the Loeb Classical Library, edition 1916)

Compare the YSMA work-site with the ancient work-site. With your students, try to find the corresponding occupations today. What are the ancient occupations that do not exist today and vice versa, what professions exist today that did not exist then? How have they evolved? Discuss other professions that are not related to the execution of the restoration works, yet relate to the promotion and preservation of the monuments, since the conservation of cultural heritage is in part comprised of its management and preservation. Professionals who specialise in these areas include museologists, architects specialising in exhibition design, model makers, etc.

Museum and archaeological site shops can generate a great deal of revenue. With your students, consider who would work for such a store, for example, interior decorators, graphic designers and so on. Design some of the products that could be sold there.

You can also consider the archaeological site and the museum as a

Cultural Centre where parallel cultural events constantly run: lectures, conferences, concerts, festivals, film, theatre and so on.

In the context of vocational education you can also discuss occupations that are less familiar to students, such as those of the people involved in the lighting of monuments and archaeological sites. Galleries, statues, and monuments all have different lighting requirements. You can also visit the Acropolis Museum, where natural light is a key feature of the building.

### THE “RESTORING THE ATHENIAN ACROPOLIS” TEACHER’S PACK TRAVELS...

Explore your area and adopt a local monument. Search for information about the monument in photographic archives, old family photos, the internet, and in local newspapers.

Try to work out whether the principles that have been applied in the Acropolis restoration works have also been applied to your local monument. Are there similar problems? How are they being approached? You can work together with your local Ephorate of Antiquities in order to discuss the issues.

Create an educational kit like the one for the Acropolis, by taking similar photographs of your monument, and hold an exhibition of your photographs about the problems as well as past and present restoration works. You can conduct interviews with the local residents about the monument. You can ask older interviewees to tell you what they remember about the monument from the past, whereas with younger people you can focus on their aspirations for the future of the monument.

Consider the monument as a focus for the development of your town. Focus on the cultural factors of economic development. You can organise the archaeological site, create a logo, design tickets, and create information leaflets about the site. Take your parents and relatives for a tour of the site. You can make proposals for the management of the archaeological site and the creation of a shop on the site.

Design an advertising campaign for the preservation of the local monument. Create a poster advertisement designed to persuade: a) local residents and b) the central government and the mayor, that restoration of the specific monument is a priority, and therefore it is worth spending a part of their limited budget on its enhancement.

In the same context you can consider issues of ethics in advertising, in connection to how the Parthenon has occasionally been used to advertise a particular product or a person.

Finally, look for sponsors from the region and organise an event to raise money for the monument.





The restoration works that are being undertaken on the Acropolis are ideal for interdisciplinary teaching, as they can be developed as a theme in a number of curriculum subjects and may be integrated into the educational material of many different classes. There is particularly strong potential for development of this subject in Environmental Education.

A series of proposals follows for creative discussions and projects that can be undertaken in various school subjects, relating not only to the restoration of the Acropolis monuments but also to the restoration of other monuments throughout Greece.

#### RESTORATION AND MODERN GREEK LANGUAGE

In modern Greek language classes you can study restoration work terminology and the etymology of the words with the aim of enriching the vocabulary of the students. This vocabulary combines the quality of the ancient Greek language with the new words of modern technology. Many of these words, like many scientific terms, have been incorporated into foreign languages and the students could search for them.

You can organise debating competitions between students based on the theoretical issues generated by the restoration works.

Ask students to create a book about the Acropolis restoration works. Students can write articles, illustrate the book, and design the front and back covers.

Students can also take on the role of journalists and conduct interviews, either real or imaginary, with members of the restoration team, or with visitors. They can then write up the articles for a newspaper. In parallel they can write a script about the works for the radio news (where there is no picture) or for television (where the text is accompanied by picture) or a longer script for a documentary. They could also create fictional texts where the monuments themselves tell their story, or the diaries of people who built the monuments or of earlier restorers, and so on.

#### RESTORATION AND HISTORY

In ancient history classes you can study the period during which the Acropolis monuments were built, and in particular the politico-economic and social conditions of the time.

In modern and contemporary history, study the restoration works in relation to phenomena of consciousness of the Greek national identity.

The terms “use”, “abuse” and “management” of the monuments can be analysed in parallel with the terms “political history”, “economic history” and “local history”.

A special theme is “how the ancient monuments affect contemporary life”. In conjunction with classes about the environment and the social sciences, study the motivations for each restoration, and the selection criteria for the monuments restored. Moreover, students could explore other issues, such as how the city’s urban development was determined when Athens was designed to become the capital, and what role the monuments played at that time or what role they play today in the city’s fabric.

You can also discuss the influence the Acropolis has exercised on the architecture of Greece, America and Europe and show the students photographs of buildings modelled after the Parthenon, the Walhalla memorial in Regensburg, Germany and the full-scale replica of the Parthenon in Nashville, Tennessee in the USA.

#### RESTORATION AND MATHEMATICS

Using the science of numbers, you can take measurements and make calculations related to the construction of the temples, you can study the proportional relationships between the floor plans and façades of the monuments, and the geometric shapes, or create tables about many different topics such as the damage to the architectural members and conservation methods.

#### RESTORATION AND TECHNOLOGY

In technology classes, the Acropolis, the monuments and the restoration works can comprise a rich source of research material for students. You can study the tools used by the ancient craftsmen in comparison to the tools used by modern marble sculptors. At the same time, try to introduce the materials, method and manner in which the ancient monuments were constructed, as well as the corresponding methods used today in the restoration.

#### RESTORATION AND THE PHYSICAL SCIENCES

In geography and geology classes you can focus on the study of the Acropolis Rock, its physical structure, earthquakes, springs, and flora. In particular, you can study the plants of the Acropolis in relation to the problems they usually cause in monuments and make proposals for the planting of the Rock. You can also study Greece’s great mineral wealth and discuss the quarries used and the building materials of the monuments

– marble and also other types of stone, and their properties. Combine your research with a visit to a quarry and use of the educational museum kit “The Art of Stone Sculpture”.

In biology and chemistry classes you can study the chemical composition of acid rain and conduct experiments. Discuss the various types of damage to the monuments and in particular, atmospheric pollution. Enrich your activities with related videos. Make use of the Parthenon frieze application at <http://www.parthenonfrieze.gr>. Play the game “Become a conservator” with your students and then watch the video that follows, about the cleaning procedure used on the frieze.

In addition students can investigate the properties of iron which was used in the past for monument restorations and discuss the impact of its use in the monuments. At the same time they can study proposals for the conservation of the monuments and learn simple applications of preventive conservation.

#### RESTORATION AND ART

The Acropolis and its monuments have been a source of inspiration for many contemporary artists who have used them in their artistic creations.

During art lessons, you can study different artistic approaches, such as: works of art with netting and scaffolding, photorealist works, cartoons, comics and logos.

Encourage students to make a collection of cartoons, logos, posters and advertisements from newspapers and the Internet, which use images of the antiquities.

Create your own craftworks. Students can create their own monument, through painting, collage or the construction of models using a variety of materials. You can also use computers to scan images and then edit them.

You can also encourage students to find construction games related to tools and machinery and create a work-site in your classroom. You can then see which of these were also used in antiquity.

You can focus on the art of photography – photography as documentation, as a means of advertising, and as fine art. You can organise an art photography competition about the monuments of the Sacred Rock. Compare later photographs with earlier ones. Try to take a contemporary photo from exactly the same angle as an older one and look at the changes that have occurred. Put yourself in the picture and note the scale.



The Parthenon restoration work was divided into twelve programs. Initially the interventions were only of a rescue character, but gradually evolved into interventions for the enhancement of the monuments and the archaeological site.



View of the northwest side of the temple before and during the works.



Digital imaging of the north colonnade, with different colours indicating the misplaced drums before the restoration, and after repositioning in their original places.

In the north colonnade, eight columns and their entablature, which had been misplaced, a total of 230 architectural members weighing 900 tons, were dismantled in order to be repaired and to be returned to their initial positions in the monument. All of the cement drums from the 1923-33 restoration were replaced with new ones of Pentelic marble. Most of the metopes were transferred to the Museum, while copies in artificial stone were set on the monument.



The east façade of the Parthenon during and after completion of restoration. On the east side 160 architectural members were dismantled. They underwent repairs and conservation work and were returned to their positions. All of the metopes were removed and transferred to the Museum, while on the monument they were replaced with copies of artificial stone.

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The pronaos of the Parthenon during the restoration.

In the pronaos colonnade which retained only one column, two columns were restored in full and three partially. Drums and fragments that were lying on the ground and supplements of new marble were used in the restoration.



The fifth column from the east on the south side before, during and after the restoration.

The lower drum of the fifth column from the east, on the south side, was supplemented with new marble after the temporary removal of the entire upper portion without disturbing the order of the drums which comprised it.



The west façade of the Parthenon during the intervention and after completion of the restoration. Approximately 130 architectural members from the opisthonaos were dismantled, repaired and returned to their positions. All the frieze blocks were removed and transferred to the Museum, while copies in artificial stone were put in their place on the monument.

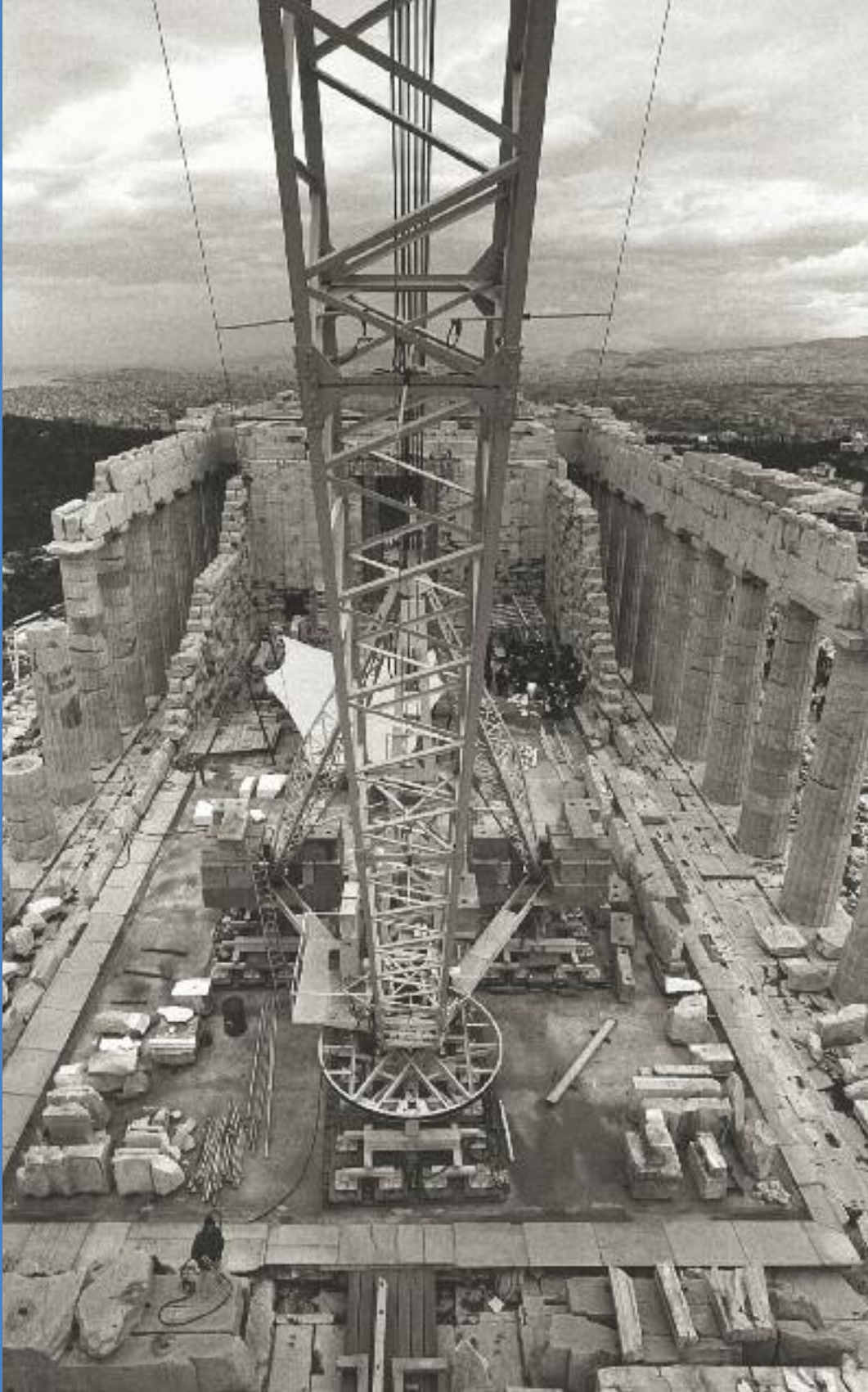


The original sculptures as well as copies of those that are today in the British Museum are exhibited in the Acropolis Museum in positions analogous to their original locations on the temple.

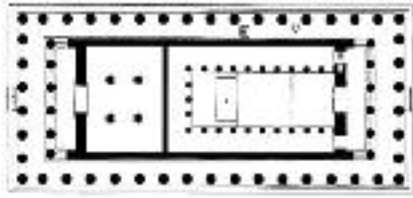
View of the Parthenon Gallery in the Acropolis Museum. (A.M.)

The work-site within the cella of the Parthenon, dominated by the rotating crane.

## THE PARTHENON 6







The masterpiece of ancient Greek architecture was dedicated to the patron of Athens, goddess Athena, whose gigantic gold and ivory statue it housed. It is a monument of the Doric order with a perimeter colonnade. It has 8 columns at

its narrow sides and a second inner row of 6 columns, as well as 17 columns at its long sides. Other two-storey interior colonnades supported the roof of the cella, the back part of which formed a large rectangular independent room. The monument is considered to have achieved perfection of the Doric order, by virtue of its harmonious proportions, the hidden refinements of its architectural forms and its technical perfection. These factors, along with its great sculptural wealth, made the Parthenon famous even during antiquity. The architects of the great temple were Iktinos and Kallikrates. It was built under the general supervision of the famous sculptor Phidias, a personal friend of the leader of the Athenians, Pericles. The temple was built during the period 447-438 B.C., during the apogee of Athenian democracy, and expressed not only the city's respect for the divine but also the Athenians' cultural superiority over other Greek cities.

Continuing the tradition of the Doric order, the Parthenon had statues on the pediments and high reliefs on the metopes. However, it also adopted an Ionic feature, the continuous frieze that ran around the cella in the uppermost zone, with a total length of 160 metres. It thus had an unprecedented wealth of sculptural decoration, including its 13-metre-high statue of the goddess in the cella, as well as the acroteria. The subjects depicted on the two pediments are the Birth of Athena on the eastern one and the Contest between Athena and Poseidon for the protection of the city on the west pediment. The metopes depict the Gigantomachy, the Fall of Troy, the Amazonomachy, and the Centauromachy, and lastly, the continuous frieze shows the Panathenaic procession. Altogether they comprise a uniquely varied ensemble of classical beauty.

The Parthenon was badly damaged by fire during the late Roman period and was later poorly repaired. In the 6th century it was converted into a Christian church with the addition of an apse of the Holy Bema at the east end, and the relocation of the entrance to the west.

During the medieval period, the Parthenon became a place of pilgrimage in honour of *Panaghia Atheniotissa* (Holy Virgin of Athens). In the 12th century it underwent repairs and a staircase was added in the opisthonaos (rear porch). During the Frankish domination it was converted into a Roman Catholic church and after the Ottoman conquest it became an Islamic mosque with the addition of a minaret and some slight modifications.

The great disaster occurred in 1687 during the period of the Venetian-Turkish war with the explosion of the gunpowder which the Turks had stored

inside the temple. Sections of the cella walls and many columns of the side colonnades collapsed. In the early 19th century, Lord Elgin removed from the monument most of the sculptural decoration, which is exhibited today at the British Museum in London.

The first studies of the Parthenon's architecture had already created considerable interest in Europe, mainly in England and Germany, and many buildings influenced by the monuments of the Acropolis were constructed. Immediately after the War of Independence, this interest intensified, the Parthenon acquired the status of national symbol, and there was a general intent for its restoration.

The work began with the removal of the later additions, general arrangements of the site, excavations, and rudimentary reversible consolidation of the north wall of the cella by K. Pittakis (1842 onwards). Other conservation work of minor importance followed, and in 1894, after an earthquake, the implementation of a new programme of consolidation and, chiefly, restoration, by N. Balanos commenced, and was continued until 1933. Balanos's work on the Parthenon was praised because it gave the building back its closed form, removed dilapidated elements, and successfully maintained the ruinous character of the temple. It had, however, three significant disadvantages as it was executed with a) widespread use of iron connecting elements and cement, b) the misplacement of similar architectural members and c) the chiselling of many ancient members, in order to facilitate the work.

The Parthenon restoration work by ESMA from 1975, and after 1999, by YSMA, was divided into twelve programs and began in 1983 with the establishment of the work-site. It was preceded by the removal of the west pediment sculptures in 1977. The restoration programme for the **east side**, which was completed in 1991, is part of the [rescue interventions](#). All the members of the two corner entablatures and all the metopes were removed and transferred to the Museum. On the monument they were replaced by exact copies in artificial stone. The precise geometrical form of the Parthenon's façade, which had been disturbed by the explosion in 1687 and an earthquake in 1981, was restored.

In 1993, the fifth column from the east on the **south side**, which was in danger of collapse, was restored after the overlying entablature was dismantled, and the entire column from the second drum upwards was removed so that the lowest drum could be filled and restored to a stable state.

The intervention on the **western section** of the building (opisthonaos, 1997-2004), was also of a rescue character. In 1993 over 20 metres of the blocks from the west frieze, the only sculptural ensemble which had remained in its place, were dismantled and transferred to the Museum, since this was proved to be the only solution to the problem of damage by the atmospheric pollution of Athens. This was preceded by the reinforcement of cracked column drums with injections of stabilising compound.

In 2000, the 21 architraves of the interior porch of the opisthonaos, which were found to be cracked from the ancient fire and the explosion, were dismantled. The

fragments were joined together, structural restoration was carried out and they were put back in place, while the frieze was replaced by exact copies in artificial stone.

The rescue interventions also include work on the **north colonnade**. Eight columns along with their entablature, a total of 230 architectural members weighing 900 tons, were dismantled in order to remove the rusted iron elements and to return them to their initial positions by correcting the misplacements of the first restoration. The program also included the replacement of cement drums from the 1923-33 restoration, with new ones of Pentelic marble. Most of the metopes were transferred to the Museum and were replaced with copies in artificial stone. The work was completed in 2010. The sections of the **side walls** of the cella, that had been restored prior to 1930, were dismantled so that the rusted iron connectors could be removed from the blocks, and the walls were completed with blocks that were identified from scattered architectural members lying around on the Acropolis. The study for the new restoration of the walls, including the resetting of the 350 members identified, is in its last stage, as is that of the intervention on the lintel of the entrance to the opisthonaos, that is, the removal of the reinforced concrete lintel remaining from the Balanos restoration and its replacement with marble.

A rescue intervention is underway on the **west façade** of the temple. This involves the dismantling of the two ends of the pediment and entablature where Balanos had intervened, the removal of rusted metal elements, structural restoration of many cracked members, and the transfer of six metopes to the Museum as well as their replacement with copies in artificial stone. The extensive restoration of the east interior porch of the temple (the pronaos, 1995-2004), which had only one column in its place, comes under the [enhancement works](#) on the Parthenon. Two more columns were entirely restored and another three in part, using both the whole and fragmented colonnade material, that was collected from members lying on the ground. The carving of the flutes on the column supplements still remains to be done. In the domain of [conservation](#) all the architectural members which were moved, were checked and underwent minor interventions: joining of chips and small fragments, sealing of cracks, removal of organic and other deposits, and removal of recrystallised layers.

A work of major importance is the conservation and cleaning of the west frieze, which was achieved using modern laser technology. This was preceded by thorough research on the response of this method to the specific problems of the Pentelic marble sculptures.

Apart from the applied [research](#) that was conducted by the staff of the technical office in the context of their restoration studies, new knowledge emerged regarding the great temple's form and construction methods and the earlier interventions it underwent both in antiquity and the medieval period.





The southwest façade of the Erechtheion during the interventions and after completion of the work.

*Interventions were made on all four sides of the temple, in order to correct the errors of the earlier restoration interventions. A total of 720 architectural members were dismantled, which underwent repair, conservation and filling, where appropriate.*



View of a section of the north side and the interior of the west side of the Erechtheion after completion of the restoration program.



View of the north side of the Erechtheion after restoration.



View of the south side of the Erechtheion after restoration.

*In the north and south walls of the temple misplaced members were returned to the positions they had occupied in antiquity, and the voids that were created in the monument's structure were filled with members made entirely from new marble. The ceilings of the north porch and of the porch of the Caryatids were dismantled and the rusted beams from the earlier intervention were removed, after which they underwent conservation work and were reassembled.*



View of the Erechtheion from the east, before and after restoration.



*The northeast corner of the temple regained the closed form of the hexastyle porch which it had in antiquity, as copies in artificial stone were set in the place of the Ionic column and overlying entablature, the originals of which are in the British Museum.*



One of the Caryatids during its transfer to the Museum.



View of the Caryatids and the frieze of the Erechtheion in the Acropolis Museum. (A.M.)

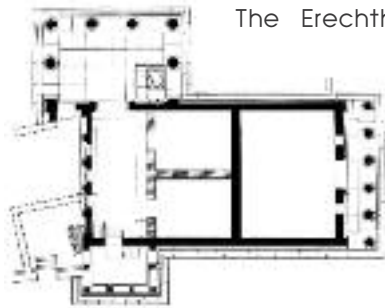
*The five original Caryatids were removed and transferred to the Acropolis Museum in order to protect them from atmospheric pollution, while on the monument were placed copies of all six Caryatids in artificial stone.*

The porch of the Caryatids without its roof. The titanium beams embedded in the architraves can be seen.

## THE ERECHTHEION 7







The Erechtheion is the latest (421-406 B.C.) of the classical monuments on the Acropolis. Here were housed the *diipetes xoanon*, a wooden statue of the goddess Athena sent by Zeus (*Dias* in Greek); the “Sacred Tokens”, the marks left by Poseidon’s trident and Athena’s olive tree; and altars for the worship of local chthonic

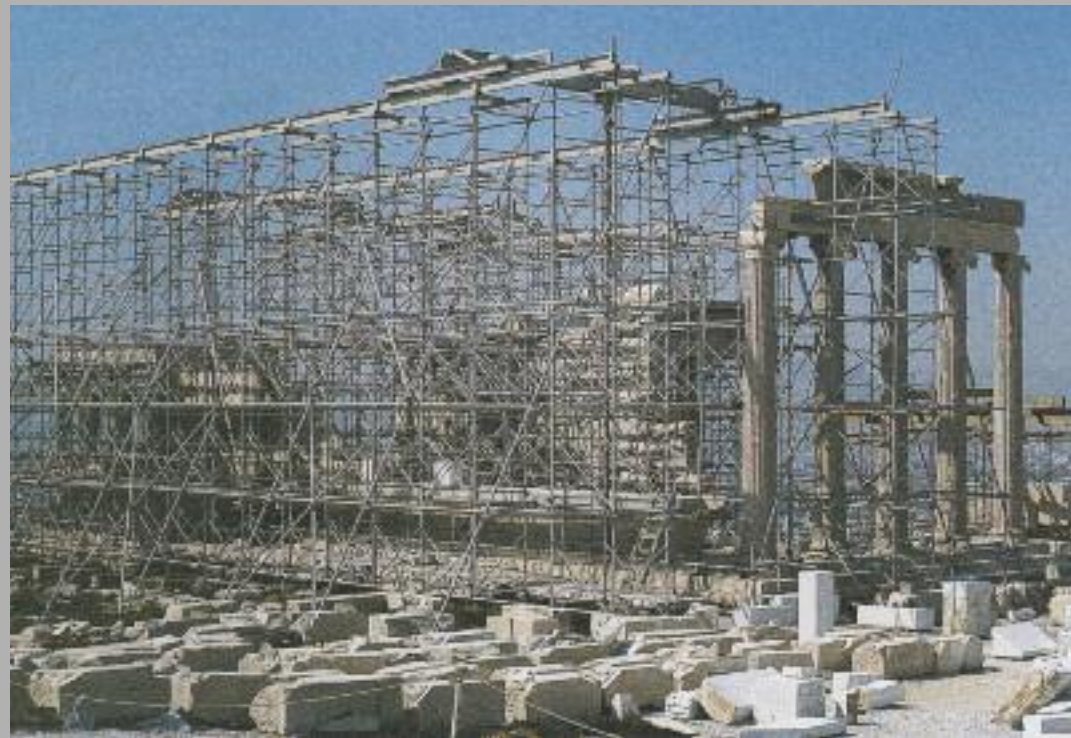
deities. The complexity of the worship that took place and the steep angle of the natural rock dictated a likewise complex floor plan developed on two levels as well as the creation of four different façades. The temple was divided into two sections, with the eastern part dedicated to Athena Polias, patron of the city, and the western part to Poseidon and Erechtheus.

The Erechtheion suffered serious fire damage and was repaired around 25 B.C. During the early Christian period it was converted to a church. At that time, the interior space in the lower level was unified and an apse was added on the east side to house the Holy Bema. It is not known whether it continued to function as a church during the medieval period.

During the Turkish occupation it was used as a residence. In the early 19th century Lord Elgin removed a column, one of the Caryatids and other architectural members that are currently held in the British Museum.

After the War of Independence, all post-antiquity additions were removed from the semi-ruined building and restoration interventions were undertaken during three periods (K. Pittakis, 1837-41; A. Paccard, 1846-47; N. Balanos, 1902-1908) which consolidated the building and restored its form in a manner that retained its ruinous quality yet approached its ancient character to a satisfactory degree.

The Erechtheion restoration work by ESMA (1979-1986) included both rescue and enhancement interventions on all four sides.



View of the southeast side of the temple during the interventions and after completion of the work.

Included in the [rescue interventions](#) were the dismantling of the porch of the Caryatids, the south wall, a section of the west wall, the ceiling of the north porch and the north wall – a total of 720 architectural members. The aim was the removal of the rusted iron beams and connectors (clamps and dowels) from the Balanos restoration, the joining together of fragments and, occasionally, the filling of architectural members with new marble in order to achieve their structural restoration.

The rescue interventions also include the transfer of the Caryatids to the enclosed, controlled environment of the Museum since it was considered that there was no other way to save them from the atmospheric pollution of Athens.

All architectural members were returned to the building apart from the Caryatids which were replaced with exact cast copies from artificial stone.

Included in the [enhancement works](#) is the replacement of many architectural members that in 1909 had been set in positions other than their original ones (in particular blocks from the building’s side walls), a project that was preceded by thorough research. Certain additions of new blocks were made where necessary.

The addition to the northeast corner of the temple of exact copies of the Ionic column and entablature members that are in the British Museum in cast artificial stone, is also part of the enhancement works. This latter work, which in any case is reversible, was considered necessary, on the one hand, in order to restore the closed hexastyle form of the temple’s façade and to increase its morphological legibility and, on the other hand, to ensure the stability of the entire colonnade in the case of a strong earthquake.

In the domain of [conservation](#), systematic work was undertaken on the interior surface of the cella walls, on the five columns of the east porch and on the marble ceiling of the porch of the Caryatids.

New [research](#) conducted on the Erechtheion focused on the existence of narrow light openings in the north wall, the monument’s recent phase and the purely theoretical research on the Sanctuary of Pandrosus with its Ionic stoa.





The Propylaia from the east side during and after its restoration.

*On the east hexastyle porch, the intervention has reached the third column drum. Approximately 200 architectural members were dismantled, underwent repair, conservation and filling where appropriate and were reset in place.*



Dismantling of coffered slabs from the roof of the Propylaia's central building. (T.T.)



Fragments of coffered slabs on the ground during research to identify matches. (T.T.)



Joining together of fragments of a beam from the Propylaia's east stoa. (T.T.)



Resetting a beam from the Propylaia's east stoa. (T.T.)

*The coffered ceilings that had been previously restored were dismantled, studied alongside the coffer and beam fragments on the ground, joined together, and reset in their original positions.*



Dismantling of an Ionic capital from the central hall.



Resetting of one of the new Ionic capitals in the central hall of the Propylaia.

*The **Ionic capital**, which Balanos had assembled from parts of four different capitals, was taken apart and the parts were placed in the Museum for protection.*

*Two new capitals, exact copies of the Ionic capitals from the central hall of the Propylaia, were carved entirely from new marble, and an Ionic column was completed with a new drum.*



Fragment of the ancient Ionic capital in the Acropolis Museum. (T.S.)



Section of the Propylaia's ceiling after the restoration.

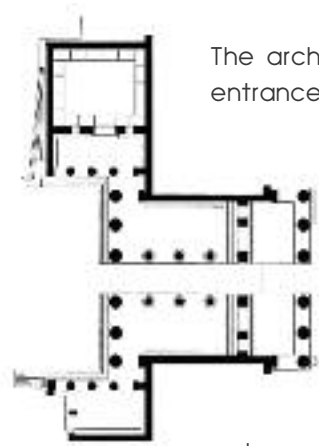
*The carving of two new capitals and the coffered slabs, in conjunction with the resetting of restored architectural members from the super-structure, led to the restoration of a section of the Propylaia ceiling.*

Setting in place of the two new Ionic capitals in the central hall of the Propylaia. (E.P.)

## THE PROPYLAIA ∞







The architect Mnesikles conceived the idea of a majestic entrance to the Sanctuary of the Acropolis, which showed originality in both style and form. It not only housed the wall with the gates that secured the Sanctuary, but extended to a spacious hypostyle hall, which had façades with six columns and pediments facing both out from and into the Acropolis. Of the four halls which the architect conceived to accompany the central building and house the city's celebrations, two were scheduled for construction and

only one was completed, situated to the left as one approaches and known today as the Pinakothek (picture gallery) from its use during the Roman period, when paintings were exhibited there.

With his design, Mnesikles made use of the ascent towards the Rock, elevating the monumental façade of the building and forming with the side wings a reception area. He treated the order in a pioneering manner, as he added towering Ionic columns in two rows in the hypostyle hall, visible from the outside, to a building in the Doric mode, and created a majestic coffered ceiling entirely of marble. There was no sculptural decoration. The monument became the model for other propyla during the Hellenistic and Roman periods.

The building of the Propylaea started immediately after the Parthenon in 437 B.C. and came to a halt after six years due to the Peloponnesian War. Many details indicate that the building was never completed.

During the Byzantine period, minor changes were made to the Propylaea, which is presumed to have served as the residence of the bishops of Athens. A chapel was built east of the Pinakothek.

Later, during the Frankish domination, changes were made to the fortifications with the closing of the intercolumniation of the façade and the creation of a side entrance with successive walls and gates. Also, in parallel with the fortification of the Acropolis, the Propylaea was converted to a ducal palace and a tall tower, which no longer survives, was raised at the south wing.

During the period of the Ottoman occupation, an ammunition explosion in 1640 left the central hall in ruins and destroyed part of the west façade. After the War of Independence, the demolition of the later fortifications and the sorting of the ancient material, consolidation works were undertaken (K. Pittakis, A. R. Ragabes) and later, the restoration works of N. Balanos. The latter restored (1909-1915) one of the Ionic columns of the central hall and a section of the coffered roof and also made additions to the eastern Doric façade of the building. The works by Balanos had the



The Propylaea from the east side before and during its restoration.

disadvantages we are familiar with from the Parthenon as regards the new materials and the treatment of the ancient material. In 1953 A. Orlandos restored part of the south wing of the Propylaea and created the existing ascent towards the entrance, which is still used today.

The [rescue operations](#) on the Propylaea included the removal of the rusted iron elements from previous restorations, structural restoration and conservation of the architectural members, as well as their reintegration into the monument. This required the dismantling of all the members that had previously been restored, on the east porch, in its stoa, the Ionic columns, the coffered roof in the central hall, and the south wall of the east stoa. The intervention began in 1990, preceded by the removal of an architrave on the east façade that was in danger of collapse (1981-82), as well as the preparation of the work-site and the study of thousands of fragments scattered on the site or temporarily stored in a Byzantine cistern northeast of the monument. The identification, filling and joining together of many of these fragments yielded several complete coffer slabs from the marble roof of both the east stoa and the central hall.

The rescue interventions also included in situ structural conservation work using injections of stabilising compound on the large lintel of the doorway wall.

A special problem arose from an Ionic capital from the previous restoration as it was comprised of fragments from four different capitals, and it was removed to the Museum.

As far as regards [surface conservation](#) of the marble, considerable work was undertaken on the shafts of the Ionic columns of the central hall, the orthostates of the Pinakothek and on all ancient architectural members that had been dismantled.

The [enhancement](#) on the Propylaea included the extension of the restoration of the central hall's marble roof, which was made possible by the recovery of many coffered slabs. The completion of another Ionic column was made possible with two new drums, while copies that were required of two new Ionic capitals were carved from new marble. The coffered roof of the east stoa was also extended.

There are further possibilities for even more substantial upgrades to the Propylaea with the partial or even complete restoration of the Pinakothek. Temporary and reversible construction work is making possible the use of the Propylaea as the sole entrance to the Acropolis.

In terms of [research](#) the exhaustive study of the Propylaea's medieval phase, the identification of six groups of fragments from Ionic capitals that are now exhibited in the Acropolis Museum, and the study of the superstructure of the ceilings and the roof of the north wing, should be noted.





The temple of Athena Nike before and during its dismantling.



(T.S.)



The temple of Athena Nike during and after its reassembly.

*The temple was dismantled in its entirety – a total of 319 architectural members – and underwent repairs, conservation and filling, where appropriate. Misplacements from previous restorations were corrected.*



Dismantling the capital and moving the shaft of a monolithic column from the temple of Athena Nike.



*The monolithic columns on the temple's east side were moved to the west, and vice versa, in order to return them to their original positions.*



Sections of the archaic poros temple beneath the floor of the temple of Athena Nike.



The new metallic grid of the temple of Athena Nike.

*Conservation work was carried out on the remains of the small archaic poros temple located 1.80 metres below the floor of the Ionic temple and accessibility to the underground site has been improved. A new metallic grid of stainless steel was created to replace the reinforced concrete slab. Following the restoration, the temple's marble floor is now supported on this grid.*



View of the sculptured frieze from the temple of Athena Nike in the Acropolis Museum. (T.S.)



View of the relief parapet of the temple of Athena Nike in the Acropolis Museum. (T.S.)

*The sculptural frieze was removed from the monument and is now protected in the Museum while its position on the monument has been taken by an exact cast replica in artificial stone. The fragments of the marble parapet that ran around the bastion were rejoined in the Museum.*

View of the temple from the northeast during the dismantling.

## THE TEMPLE OF ATHENA NIKE 9







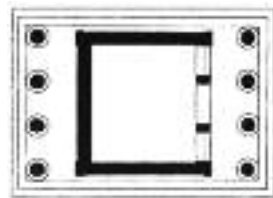
View of the northeast side of the temple prior to its dismantling.



The temple of Athena Nike after its dismantling.



The temple of Athena Nike after its reassembly.



The Temple of Athena Nike was constructed of pentelic marble on a bastion southwest of the Propylaia, between 427 and 424 BC. It is attributed to the architect Kallikrates. A monument of the Ionic order, it is of small scale and simple in form, with four columns on the east side and another four on the west. It bore rich sculptural decoration on the Ionic frieze (now in the Museum), on the pediments (only a few fragments of which have been preserved) and on the elaborate parapet depicting Athena and Nikai (personifications of victory), that ran around the bastion (sections of the parapet are now in the Museum).

During the medieval period, the temple was enclosed by the wall which rose above the bastion and was thus preserved in very good condition. By destroying the floor the Turks created a gunpowder store and in 1687 dismantled the temple and incorporated all its

members into new fortifications on the west side of the Acropolis. Lord Elgin later removed and took a part of the frieze.

After demolition of the Turkish fortifications, the temple's architectural members were collected and its restoration was undertaken on two occasions (a. by Ludwig Ross and Christian Hansen, 1835, and Kyriakos Pittakis, 1834-44; b. by Nikolaos Balanos, 1935-39, and Anastasios Orlandos, 1939-1940). These interventions resulted in a significant loss of authenticity, due to the inexpert chiselling and fillings of various members, the use of cement, the misplacement of other members, and imperfect beddings between them. Bronze had been used for the connecting elements, rather than iron.

The only intervention of a **rescue** character in YSMA's new programs for the temple of Athena Nike was the removal of the sculptured frieze (in 1998) and its protection in the enclosed space of the Museum, given that here there were no rusted iron elements present from previous restorations.

During the new intervention undertaken as part of the monument's **enhancement**, the entire temple was dismantled; conservation work was carried out on the remains of a small archaic limestone temple that had been discovered in situ 1.80 metres below; the system of iron beams that supported the northeast corner of the temple was replaced with a new stainless steel grid; restoration and preservation work was carried out on approximately 300 architectural members with the incorporation of new material, where appropriate; and a new restoration was undertaken, which also corrected the errors made in the positioning of the temple's members during the previous interventions. Further restoration work was carried out on the cornices, simas and east pediment of the temple. An exact replica of the frieze, cast in artificial stone, was mounted in its place.

In terms of **conservation**, all the members of the temple were subjected to systematic conservation work prior to their placement.





(YSMA Archive)



General view of the Acropolis from the Propylaea towards the east, before and after the creation of the walkway that protects the Rock from the footsteps of visitors.



The natural rock and the walls of the Acropolis from the northeast and the south sides.



Aerial photographs of the area of the Arrephorion before and after reburial of the monument to ensure its preservation. (V.M.)



Scattered architectural members and fragments carefully arranged in the area north of the old Acropolis Museum.



The lift for people with special needs at the Acropolis. (T.S.)



Scattered architectural members and fragments in the area southwest of the Erechtheion.

The natural rock below the southeast corner of the Acropolis wall. Wooden scaffolding for the consolidation work.

## THE ROCK, THE WALLS AND THE ENVIRONMENT





The Acropolis Rock is a monument of the natural environment, a landmark of the urban landscape of Athens, a historic monument in itself, an archaeological site with thousands of architectural members, and at the same time the immediate environment of the classical monuments. It should also be noted that the archaeological excavations of the previous two centuries removed ancient deposits, exposed the foundations of the buildings to degradation, and created a rough rock surface that hinders accessibility.

All these factors create complex management problems which were exacerbated by the setup of extensive work-sites for the needs of the works and by the rapid increase in the number of visitors in recent years.

The work-sites necessitated sheds, scaffolding, a lift at the south-east corner of the Rock, bridge cranes for all the monuments, and two cranes for the Parthenon. All these are temporary, but have aggravated the immediate environment of the monuments for almost thirty years.

For protection against the [damage caused by the footsteps](#) of visitors, entry into the monuments was forbidden and walkways of light concrete were created, made reversible with the insertion of plastic sheeting.

A typical example of a rescue intervention was the [reburial of the “House of the Arrephoroi”](#) where only the foundations made of poros-stone survived and which remained exposed to frost and



General view of the Acropolis from the west. (S.G.)

wind, since its entire superstructure has been destroyed. It was considered that it could be preserved effectively only if it were reburied, after detailed documentation and study.

A major problem of the Acropolis archaeological site is the thousands of [fragments of marble and poros architectural members and inscriptions](#), which are scattered across almost its entire area. An endeavour has been underway since 1980 to record, identify and protect these, and has yielded a significant number of members useful in the restoration of the monuments, and finds of great importance in terms of research or the enrichment of the Museum.

[Studies on the technical restoration of the ground](#) of the Acropolis when the works are completed, the work-site installations removed, and the scattered fragments stored in covered spaces, have already been undertaken.

The natural [rock of the eastern and southern slopes](#) on which the ancient and later walls of the Acropolis are partially supported was consolidated (1980-1993) with stainless steel anchorings and special injections. An extensive documentation program using modern technology is already underway on all the walls surrounding the Acropolis, using multiple recording methods of micro-movements, mainly at the carved stonework of the ancient wall that shows evidence of cracks and erosion due to earthquakes and rainwater.

Finally, it is worth noting that in 2004 a [lift for people with special needs](#) was installed on the north side of the Acropolis.