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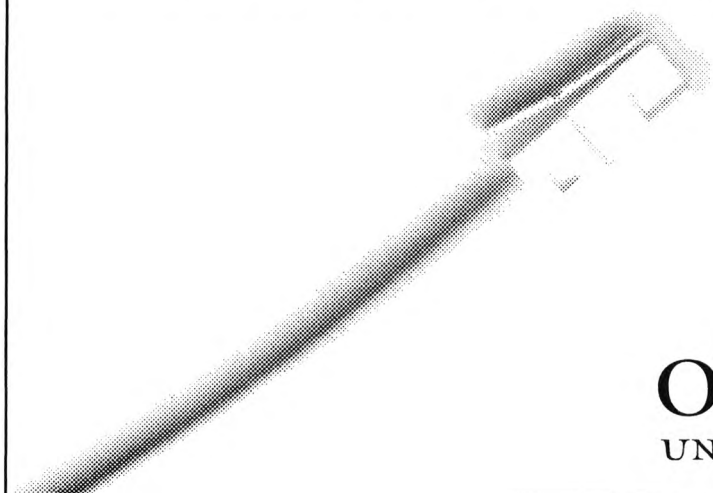
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# ARTICLES

## Site Management at Giza Plateau: Master Plan for the Conservation of the Site

ZAHY HAWASS\*

*The Giza pyramids, one of the world's most important archaeological sites, are threatened by urban expansion, pollution, conservation challenges, and the pressures of tourism. A critical need exists for effective site management to protect the archaeological riches of this important site. The author describes the implementation of a four-phase management plan initiated in 1988. In the first phase, an organization scheme for the site was prepared. Phase II defined a conservation and archaeological plan for the east side of the Great Pyramid and for the queens' pyramids. Phase III, which is ongoing, will define conservation of the three main pyramids, includes a tourism management plan, and will complete development of a site master plan. Phase IV will outline a program for ongoing archaeological research and conservation. The site management plan for the Giza Plateau provides a model for addressing a wide spectrum of environmental issues affecting archaeological sites.*

### 1 INTRODUCTION

The Giza Plateau contains one of the Seven Wonders of the World: the fascinating pyramid of Khufu, whom the Greeks called Cheops. Khafre, known as Chephren to the Greeks, placed his pyramid just south of his father's. The pyramid complex of Khafre is the Giza Plateau's most complete; it is also the most complete of all the Old Kingdom pyramid sites. To the south lies the third pyramid, that of Menkaure, son of Khafre and grandson of Khufu.<sup>1</sup> Adjacent to these three main pyramids are eight subsidiary pyramids located on the east and south sides of

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\*The author is an eminent Egyptologist who lectures all over the world. In addition to his work as director general of the Giza pyramids and Saqqara, he teaches archaeology at Cairo University and the University of California, Los Angeles. His publications include numerous articles on Egyptology and books on the pyramids, kingship, and women in ancient Egypt. Dr. Hawass was awarded Egypt's Order of Arts and Science, First Class, for his dedicated restoration of the Sphinx. He is currently busy with the Giza Plateau conservation project and developing a new approach to accommodate tourism and archaeology.





FIGURE 1. THE SITE OF THE GIZA PLATEAU IN 1936. THE THREE PYRAMIDS OF KHUFU, KHAFRE, AND MENKAURE. THE SPHINX IS LOCATED FARTHER DOWN THE PLATEAU.

the main pyramid. One was discovered only recently at the southeast corner of Khufu's Great Pyramid.<sup>2</sup>

The site also includes major tombs of the Old Kingdom, located within the vast cemeteries associated with the pyramids. Recent excavations uncovered a new cemetery of the tombs of the workmen and overseers of the pyramid builders, southeast of the Sphinx.<sup>3</sup> The Sphinx, representing a lion with the head of a king, lies on the site of an Old Kingdom quarry. It was carved out of the bedrock core that was left standing when the surrounding rock was cut away to build tombs and temples.<sup>4</sup>

For thousands of years, the pyramids of ancient Egypt have captivated humankind on both the material and the spiritual level. It is the material level that inspires awe when one views the pyramids. How did people four and five millennia ago bring together the brilliance and the technology to create these structures? What engineering genius, not to mention general contracting capability, erected monuments that modern man would be hard-pressed to duplicate? What community vision encouraged these wonders? At the spiritual level one feels the human heart's plaintive, futile cry for immortality. Mysticism and occultism also imbue the pyramids with fascination. This subject does not lend itself to widespread academic analysis; rather, it turns upon the faith and idiosyncrasies of believers.

Seeking to prove existing theories and formulate new ones, Egyptologists from many countries continue to excavate and study the archaeological remains

of the pyramid sites. Although we may never have all the answers, these magnificent edifices are formidable reminders of the fascinating culture of ancient Egypt. Therefore, it is very important to preserve the site and work together to conserve and protect the pyramids for humankind.

## 2 THREATS TO THE GIZA PLATEAU

Many elements threaten the pyramids and the Sphinx at Giza:<sup>5</sup> the growth of villages around the pyramids; rise of the water table; tourism; pollution and the environment; vehicular traffic; conservation problems; limestone quarrying; Egyptian visitors during national holidays; camels and horses inside the site; and modern construction on the site.

### 2.1 THE GROWTH OF VILLAGES AROUND THE PYRAMIDS

At the foot of the Great Pyramid lies Nazlet el-Samman, a village of more than 200,000 people. Beneath their homes are many archaeological elements dating to the Old Kingdom, such as the causeway and the valley temple of Khufu. Here too, we recorded an Old Kingdom settlement about three kilometers square. During the Greek and Roman periods the village was called Busiris, as mentioned by Pliny the Elder. The name has changed several times since then. About 200 years ago it was called the Black Land, and later, it and the other villages in the area were called the Green Land. Then, about 90 years ago, a sheik called El-Samman lived in the area and worshiped God at the tomb of Debehen, dated to the reign of Menkaure. After the death of the sheik, the village was renamed Nazlet el-Samman, meaning "the place where el-Samman lived."<sup>6</sup> Other ancient villages in the area took modern names, such as Nazlet el-Sisi, Nazlet el-Batran, and Kafr el-Gebel. Harania was derived from Horoun, the Canaanite name for the Sphinx.

Over time the villages grew and became cities. In 1984 they were given permission to build houses up to six stories high. These tall structures encroach within a few meters of the Sphinx. The effect is worsened by the visual pollution of their multiple colors. Also in 1984, residents were given antiquities lands to build houses and football fields to the southeast of the Sphinx. Meanwhile, others built houses and shops illegally on antiquities lands.

At the same time the Giza governorate built another large city, called Khafr el-Gebel, just five kilometers southeast of the Sphinx. The buildings of this new suburb of Giza are also six stories high and painted in different colors. To the west another city was built just down the plateau from the pyramids on Fayum Road. One can look from the plateau toward the west and see this town; it also completely hides the pyramids from the view of people coming from Alexandria. The new city erected schools, gas stations, and other new buildings all along Fayum Road and on the cliff of the plateau.<sup>7</sup>



FIGURE 2. THE MODERN BOAT MUSEUM NEAR THE GREAT PYRAMID.

Along Pyramids Road, houses were built on the left as one drives toward the pyramids. The buildings reach about ten stories high, blocking the view of the monuments. No longer can the pyramids be seen from Giza Square or the Mo-handissiin area. Now the pyramids are almost downtown.

The Egyptian Antiquities Organization gave permission in 1984 to the Ministry of Housing and New Communities to build an extension of Cairo's ring road to a point about three kilometers south of the Giza pyramids and just to the north of the site of Zawyet el-Arian. The plan called for the road to connect the ring road with the Fayum Road. This road threatened the site by severing the pyramids from their expansive desert environment. Moreover, it would have cut through the archaeologically rich Memphis Cemetery that extends from Abou-Rawash in the north to Dahshur and beyond in the south—an area protected by UNESCO as a World Heritage site. The risk to heritage posed by the road would escalate as it attracted other housing and gas-station construction along its shoulders.

Planners determined that a four kilometer-long section running east to west would be situated just south of the Giza site. During archaeological excavations conducted in a small quadrant of the endangered area, we found coffins containing “mummified” wooden statues buried in rock-cut tombs, suggesting a cenotaph to the god Sokar-Osiris. In May 1995, President Hosni Mubarak issued a decree to stop the road. This decision is among the most important for antiquities in Egypt because it shows that Egypt cares more about its monuments than its development projects.<sup>8</sup>

The Supreme Council of Antiquities has discussed the final plan for the villages, including Nazlet el-Samman, and will present it to parliament. In the plan, the zone of habitation is divided into three sections according to archaeological sensitivity and permissible land use. Section A is an area in which all structures are forbidden. It encompasses the causeway, the valley temple of Khufu, and the Old Kingdom settlement. The building sanction goes so far as to forbid residents to rebuild their own houses. The Supreme Council of Antiquities plans to pay compensation to affected landowners. In section B people may build houses that do not exceed three meters in height. Section C is an area where construction is permitted, but the Department of Antiquities will oversee the digging of the foundations in case monuments are revealed.

## 2.2 RISE OF THE WATER TABLE

Until recently, the villages near the Giza site had no sewage system. Water accumulated under the monument site and caused the precipitation of destructive salts.<sup>9</sup> (Salts are the main problem for the Sphinx because they turn the limestone into powder.<sup>10</sup>) Alarmingly, the water table rose to about one to two meters from the base of the Sphinx.<sup>11</sup> The Egyptian government launched an important project to install a sewage system for the whole area, including the villages around the pyramids. The project, begun in 1990 by AMBRIC, was completed in 1993.<sup>12</sup> As a result, the groundwater under the Sphinx has dropped to seven meters, and the walls of Khafre's valley temple, the Grand Gallery of the Great Pyramid, and the nearby tombs are free of salts. However, other artifacts from the tombs of the workmen and the overseers of the pyramid builders remain at risk of damage from the water table and salts.

## 2.3 TOURISM

Tourists cause serious damage to the monuments just by breathing. Moisture in the breath has been traced as a cause of the destructive salts inside the Great Pyramid. To reduce the damage, the Department of Antiquities at Giza inaugurated a very important conservation program at the three pyramids of Giza. Khafre's pyramid was closed for two years while a program of maintenance, protection, and conservation was completed. Menkaure's pyramid was closed for six months for the same reason. Khufu's Great Pyramid was closed for a year so the walls of the Grand Gallery could be restored. Salt deposits in the gallery that had accumulated to a thickness of five centimeters were removed mechanically, and the electrical system was updated.<sup>13</sup>

As pyramid conservation work proceeded between 1988 and 1991, we kept the tourist authority informed regarding closing dates for the pyramids, which helped us to maintain the good cooperation we have established with the tourist authority regarding the pyramid site. We understand the importance of tourism



FIGURE 3. THE CONSTRUCTION OF THE SEWAGE SYSTEM OF THE VILLAGE OF NAZLET EL-SAMMAN. BLOCKS FROM THE CAUSEWAY OF KHUFU'S PYRAMID WERE DISCOVERED NEARBY.

revenues for the country's economy and also for the preservation of the monuments. The management plan includes special arrangements for site visits, such as opening the Great Pyramid after hours for meditation by members of metaphysical groups.

Our sole source of revenue is the fee paid for admission. We have neither an educational program nor an interpretation system for the tourists, and there is no sales shop to generate additional income.<sup>14</sup>

#### 2.4 POLLUTION AND THE ENVIRONMENT

Rain, wind, moisture, heat, and pollution from nearby factories combine to damage the monuments. The Sphinx in particular has a problem with the wind pounding against its northern side. Even the ancient Egyptians were concerned with this problem: during the New Kingdom, Thutmose IV built mud-brick walls on the Sphinx's north side to protect it.<sup>15</sup>

The surfaces of the pyramids suffer from acid rain that causes the mighty two-ton limestone blocks to crumble. A plan was initiated to restore the stones on the south side of the Great Pyramids. Because of the lack of equipment and personnel to do a photogrammetric map, the work remains unfinished.



FIGURE 4. THE RESTORATION OF THE SPHINX (1982–87). LARGE STONES AND CEMENT WERE USED.

### 2.5 VEHICULAR TRAFFIC

The problem of vehicular traffic at the pyramid site must be examined carefully, because it is a problem for other sites in Egypt as well. Tourist buses, trucks, taxis, and private cars are all allowed to enter and drive around the pyramids and tombs. As they meander around the site, their exhaust exacerbates the air pollution in the area, and their vibrations cause the tomb paintings to deteriorate. In addition, the presence of vehicular traffic increases solid-waste pollution around the site, while the multicolored buses parked in front of the pyramids create visual pollution unworthy of the noble monuments.

### 2.6 CONSERVATION PROBLEMS

The site is also plagued by problems caused by inappropriate conservation methods used in the past. The Sphinx, for example, has suffered from poor restoration attempts conducted during 1981–1987. The architects chose large stones for the restoration, not small stones such as those used by restorers in the Roman period (30 B.C.). The modern restorers made matters worse by using cement to affix the blocks.<sup>16</sup> Indeed, most of their restoration was based on imagination, not knowledge.<sup>17</sup>

Other major conservation problems have occurred with the restoration of the south side of the Great Pyramid of Khufu. The project was being conducted haphazardly, without plan or strategy, until we ordered the work to stop. We have very few personnel with satisfactory training in the field of conservation, especially ar-





FIGURE 5. RESTORATION OF THE TAIL IN 1993.

chitectural conservation. On the other hand, some important conservation work using scientifically correct techniques, including thorough preliminary documentation, has been successfully undertaken for the three pyramids at Giza. Another plan has outlined conservation for the tombs in the eastern field, those of the western field of Khufu's pyramid, and those lining the causeway of Khafre. This conservation plan owes its success to the cooperation among archaeologists, architects, and conservators.<sup>18</sup>

In 1988, the Getty Conservation Institute submitted a plan to cover the Sphinx with a tent or shelf to protect it from pollution, moisture, rain, and other sources of damage.<sup>19</sup> Although this plan was inappropriate, the Institute made a very important contribution to the preservation of the Sphinx when it established an electronic weather station, first on top of the monument and later on the ground near its railing. The station provided useful data as it monitored, among other things, humidity, moisture, and wind. Such information is essential for our conservation plans. The site also lacks a large and complete conservation laboratory, which could help in the conservation of artifacts and in the computer documentation of artifacts, tombs, and a host of other things. Currently, the laboratory at Giza is insufficient for all the conservation projects.

## 2.7 LIMESTONE QUARRYING

Private limestone quarries have been opened and operating in the area near the pyramids since 1970. One site is about ten kilometers west of the Great Pyramid,



while the other is a mere six kilometers to the northwest. The site produces a white limestone powder that is used for processing sugar. The National Institute of Astronomy and Geophysics Research studied the effect on the Sphinx of various activities in the area. Researchers found that the use of dynamite in the quarry causes vibrations that are dangerous to the Sphinx. The Department of Antiquities at Giza, the Institute, and the Giza governorate prepared a plan with the quarries' owner to control the amount of dynamite used. Mechanical monitors were also installed around the Sphinx to record any kind of vibration.<sup>20</sup>

## 2.8 EGYPTIAN VISITORS DURING NATIONAL HOLIDAYS

Egyptian visitors to the Giza site exceed 400,000 per day on national holidays. The majority of visits to the site are for fun rather than culture or education. On such days, one can see some people climbing the pyramids or playing football. New graffiti on the tombs bears grim witness to their visit. It is unfortunate that Egypt's own people are a source of site pollution. Recreational visitors damage the monuments and degrade the dignity of the site.

## 2.9 CAMELS AND HORSES INSIDE THE SITE

Camels and horses have become "a part of the site," as people say. Tourists expect to see the pyramids with camels. Every poster of the pyramids has to have a camel in the photograph. Yet camel and horse vendors are the most irritating factors in a visit to the pyramids. Furthermore, the Department of Antiquities pays about 100,000 Egyptian pounds for a private cleaning company to clean up after the horses and camels. The vendors and the animals also make so much noise that cultural activities must be halted. These animals cause site pollution just as the buses do.

## 2.10 MODERN CONSTRUCTION ON THE SITE

There are many buildings on the plateau, such as housing for the guards, drivers, and workmen. These houses have existed on the site since 1881. G. Reisner of Harvard University built the Harvard Camp on the site; it is now a rest house. Cairo University also has storage houses and a rest house. King Farouk built a rest house on the edge of the northeast corner of the plateau. In more recent times, a facility complete with cafeteria, entrance gate, and seating area has been constructed to the east of the Sphinx for the sound and light show. This show is responsible for the banks of lights set up throughout the site, many of which have destroyed or damaged ancient remains. The Inspectorate of Antiquities also has offices located to the west of the western cemetery associated with the pyramid of Khufu.

All these buildings should be moved because they bring with them the conservation problem of leaking water pipes. Aesthetics also demands their removal.

We began demolishing some of the new buildings in early August of 1995, and there are plans to demolish the others as well.

### 3 SITE MANAGEMENT

Our plan for the management of the Giza Plateau called for four phases: three phases have been completed, and the last phase is now in progress.

#### 3.1 PHASE I

Phase I may be called maintenance, control, and management practices. This phase was in essence an organization of the site and is summarized below.

##### 3.1.1

An entrance and exit were established for the site. We built a simple gate for anyone coming from the pyramid road to pay a fee for admission to the site. Before, only visitors who entered the pyramids paid an admission fee. This change increased revenue to 1 million Egyptian pounds per month from the previous income of only about 100,000 pounds each month. We also created a fee for cars, which helped limit the number that entered the plateau and also raised revenues. Furthermore, we created a special ticket for the Great Pyramid after we finished restoring it. This ticket also served to limit the number of people who entered the pyramid.

##### 3.1.2

Conservation of the Sphinx began in 1988 with a well-trained team (see above). After completion of Phase I of the Sphinx conservation, the first symposium on the Sphinx was held. It brought about ninety scholars to Egypt to discuss the restoration and the future of the Sphinx.<sup>21</sup> We completed the conservation on December 25, 1997. Egypt hosted a grand celebration on May 25, 1998, announcing to the world that the Sphinx is safe.

##### 3.1.3

A private company was hired to clean up the site. In 1988 we won a prize from the British guild for travel writers because for the first time, the site was clean.

##### 3.1.4

Personnel at the site received training in archaeological and conservation methods. One individual participated in a training program in Cyprus through the Getty Conservation Institute; others participated in programs offered through the American Research Center in Egypt and the German Archaeological Institute. Meanwhile, other archaeologists and conservators received training through the foreign expeditions working in Egypt.



FIGURE 6. THE SPHINX IN 1998.

### 3.1.5

Immediate action was taken by the governor of Giza to stop any kind of new construction of housing within the village of Nazlet el-Samman and other surrounding villages. Another decree established that new houses could be built in a different area, called the new Nazlet el-Samman, located on Fayum Road.<sup>22</sup> The sewage system was established at the same time (see above).

## 3.2 PHASE II

The objectives of managing the site were planned from the beginning, but it was difficult to devise a strategy without government support.<sup>23</sup> Phase II was important because during this phase we were better able to deal with the existing site.

A conservation and archaeological plan was established for the east side of the Great Pyramid of Khufu. This site was chosen because it has archaeological value and because most of the monuments on it were in danger. It was also a manageable part of the whole conservation site plan (see below). The objective of the work in this area was to open new sites for visitors as a means of reducing pressure on the overused archaeological monuments on the plateau. Conservation problems result when tourists are guided to only three sites: they enter the Great Pyramid, go on to the valley temple of Khafre, and finish with a visit to the Sphinx—all in about two hours.

Prior to our work, we documented the existing paved road that allowed vehicles to drive on the basalt pavement of the funerary temple of Khufu, in addition



FIGURE 7. THE AUTHOR WITH AHMED EL-SAWI DISCUSSING THE RESTORATION OF THE SPHINX'S CHEST.



FIGURE 8. THE PLAN OF THE SPHINX SQUARE.

to such archaeological features such as the queens' pyramids, the boat pits, the trial passage, and the Hetep-heres shaft.

Work started in 1984 and was completed in 1995. The site was documented before the excavation and conservation started. Also, personnel such as archaeologists, conservators, and architects were prepared and knew exactly what the objectives and policies were. Decisions were made mainly through the site director, with approval from the (then) Egyptian Antiquities Organization. Implementation of

the plan followed careful consideration of the methods proposed by trained personnel to handle excavation and restoration.

First, the asphalt pavement of the road was removed to stop cars from entering the area and to close the site for work. Removing the road revealed a boat pit cut in the rock (about forty meters long and nine meters deep). It took us almost one year to take the sand out of the pit. Graffiti was found written on stones inside the pit, and its edges were badly damaged. A restoration program was established for the pit.

Three types of conservation work were done on the queens' pyramids. The first was interior conservation, which included removing the salt from pyramid entrances, cleaning the graffiti from the pyramid interiors, and installing ladders and electrical systems for lighting the three pyramids. The second was the architectural restoration of the interiors. As a guiding principle, we believe that the pyramids are ruins and that we should keep them as ruins. Therefore, we seek to restore, not to reconstruct. The plan for the area included the restoration of the temple of Isis located to the east of the Henutsen pyramid (Q<sub>1</sub>C), which is the southernmost of the queens' pyramids.

The third type of conservation work was excavation around the pyramids, cleaning the other boat pit located between two of the queens' pyramids, and digging on the south side of the Henutsen pyramid. Important archaeological features related to pyramid construction were recorded around the queens' pyramids, and a new pyramid was found on the southeast corner of Khufu's pyramid. About three meters remain of the superstructure of this new pyramid. Other site features were updated for visitor use: a sidewalk was constructed of wood to guide visitors to pyramids or other archaeological sites, and a detailed map of the site was made.<sup>24</sup> Meanwhile, work on the restoration of the newly discovered pyramid continues.

### 3.3 PHASE III

This phase includes the preparation of a master plan for the site. The recent history of a master plan for the Giza Plateau began in 1960, when UNESCO sent an expert to Egypt at the request of the Egyptian government. He prepared a report offering many suggestions and solutions regarding conservation of the Giza Plateau. In 1985, the Giza governorate presented a master plan prepared by an Egyptian architectural firm. However, the plan did not include provisions for visitor management or conservation. In 1987, the Egyptian Antiquities Organization (EAO) launched a planning project, but most of it involved changing numerous archaeological features. It also did not develop a strategy regarding site preservation. Therefore, the project was completely rejected.<sup>25</sup>

In 1990, Moustafa Sinbol, an Egyptian architect, prepared another plan for the Sphinx square. As a result, a wall was built to separate the village of Nazlet



FIGURE 9. THE PLAN OF THE SPHINX SQUARE.

el-Samman from the Sphinx. The wall was built high enough to block the view of modern houses, which are not in keeping with the dignity of the ancient site. Furthermore, the wall includes tourist facilities such as toilets, a first-aid station, and offices for the tourist police and antiquities officials. At the same time, we prohibited cars from parking in front of the Sphinx and established a new parking lot away from the site. It is important to note that architects cannot work alone in site planning; cooperation between archaeologists and architects is needed. Nevertheless, archaeologists should be in control of site management, and architects should carry out their plans.

In 1991, the Supreme Council of Antiquities (formerly the EAO) asked UNESCO to send an expert to advise them on a master plan that was under study. The experts connected with an office called Conservation Practice, arrived from London. Their study was dependent upon earlier ones; they wrote up a master plan but did not come up with anything new. They adopted the best elements of all the preceding project proposals and discussed details with experienced archaeologists and others with knowledge of the site.<sup>26</sup> The draft of the master plan was discussed and approved and then turned over to the Center for Archaeological Engineering in the Faculty of Engineering, Cairo University. The center is preparing the working version of the master plan. Phase III mainly involved visitor management, protection, and infrastructure development.

In the master plan, a tourist road will carry all traffic. The road will be a ring road around the border of the plateau, built away from antiquities land. On the



east side of the plateau, a swath of houses about twenty meters wide would be demolished. In addition, educational programs for foreign tourists and Egyptians will be offered at two cultural centers. The first will be built at the entrance to the plateau near the Mena House hotel. The second, to be called the Desert Center, will be located in the desert south of the pyramid of Menkaure. The centers will include IMAX theaters, souvenir shops, and various tourist facilities. Each center will tell a different archaeological story. These centers will educate while they generate income.

Horse and camel stables will be transferred to the south of the plateau, near the Desert Center. Riding horses or camels within the Giza site will be prohibited: the pyramids will only serve as a distant backdrop for visitors riding camels. A picnic area will be established on the far south edge of the plateau, and all modern structures on the plateau will be demolished, as well as all paved roads. No vehicles will be permitted on the plateau except for electric-powered ones to be made available for use by people with limited mobility. Finally, a conservation lab and antiquities offices will be built down the plateau.

I have some criticisms of the master plan. First, I believe that we do not have architects capable of designing the interior or exterior of the cultural centers. Therefore, we need foreign experts who have experience in this field to cooperate in this project. The most recent plans for these buildings have pharaonic façades. Such false, amusement park-like construction is not appropriate for this world heritage site. Second, the ring road around the pyramids cannot have two-way traffic because the visitor's view of the pyramid area would be impaired by the need to watch out for approaching traffic. The part of the ring road to the east that requires demolition will create many problems with the people of the village that may bring an end to the ring road plan. Furthermore, the site of the ring road must be excavated completely prior to road construction to discover any archaeologically significant features or artifacts that may lie beneath it.

### 3.4 PHASE IV

This phase includes archaeological research and conservation at the site itself and will require at least ten to fifteen years of excavation and conservation.

#### 3.4.1

The Phase II plan to the east of the Great Pyramid is to be continued. To the east of the subsidiary pyramids are located tombs of nobles and members of the royal family. As these tombs are filled, covered, and surrounded by sand, we need to re-excavate the site, architecturally restore the tombs, and complete their conservation. Each tomb will be numbered and should have an interpretive signpost associated with it.



FIGURE 10. THE RESTORATION AND CLEANING OF THE EAST SIDE OF THE GREAT PYRAMID. REMAINS OF A NEW PYRAMID WERE DISCOVERED NEARBY.

The same work will be conducted in the cemetery south of the Great Pyramid and also on the causeway of Khafre. The western cemetery field is a major site and needs the same procedures as the eastern field. These sites have already been excavated by a number of scholars,<sup>27</sup> but many areas between the tombs have remained intact and unexcavated, so careful archaeological research needs to be done.<sup>28</sup> Therefore, each site needs a fully equipped conservation lab operated by well-trained personnel.

#### 3.4.2

Near the pyramid of Menkaure, careful work is required. The area south and west of the pyramid is full of sand that has never been excavated. We expect to find part of the pyramid's construction ramp and additional boat pits. Furthermore, the granite casings (there used to be sixteen courses) are falling. The work will in-

clude documentation, restoration of as many granite blocks to the pyramids as possible, and significant restoration and conservation of the subsidiary pyramids.

### 3.4.3

A program to restore the exteriors of the three Great Pyramids of Giza will require a photogrammetric map for each side of each pyramid, appropriate tools and equipment, and documentation.<sup>29</sup> In addition, as the final phase nears completion, we must ensure that all tomb wall paintings and artifacts are documented in a computer database.

Some of the phases of the master plan of the Giza plateau present serious difficulties and will need the support of people who believe in the importance of this archaeologically unique site. Phases III and IV are not finished, but we have completed the conservation plans for many sites, including the tombs of Senedjem-ib-Inty, Khnum-Inty, Akhet-Mehu, and Senedjem-ib-Mehu, all dated to the Fifth Dynasty, about 4,200 years ago. These tombs were discovered sixty years ago by George Reisner and were in poor condition. We restored the tombs by adding missing pillars and returning inscribed blocks to the walls. Ceilings were put above the tombs for protection, and the floors were protected with wood. An electrical system was installed also.

Ten tombs located south of the causeway of Khafre have been cleaned and had lighting installed. The tomb walls have been reinforced and inscriptions restored. Among these tombs is that of Debehen, the “lector priest” and “overseer of the divine places of the great palace”. Debehen met King Menkaure during his inspection of the area and asked the king for permission to build himself a tomb. The king ordered the overseer of all his works to cut limestone from the royal quarry at Tura to build a tomb for Debehen. This event was recorded on Debehen’s tomb along with other interesting scenes from this nobleman’s funeral.

We also restored the pyramid of Menkaure himself. We closed it for one year while we cleaned the walls and restored weak parts with mortar. We removed graffiti from the king’s burial chamber and salts from the walls. A ventilation system was installed to ensure air exchange every two hours, thereby reducing humidity. The electrical system was also improved. We reopened his pyramid to visitors in March 1998. Also restored is the tomb of Iwn-Min, the eldest son of King Menkaure.

Work continued with the closure of the pyramid of Khufu on April 1, 1998. Over a period of eight months we will carry out an ambitious plan to open to the public the first subterranean chamber and the so-called queen’s chamber. We will repair a crack in the Grand Gallery, remove the salt from the passage walls and the Grand Gallery, remove the modern graffiti from the pyramid’s interior, and change the electrical system. Although people from the tourist department complain about the closing of the pyramid, it was the next one scheduled to be closed ac-

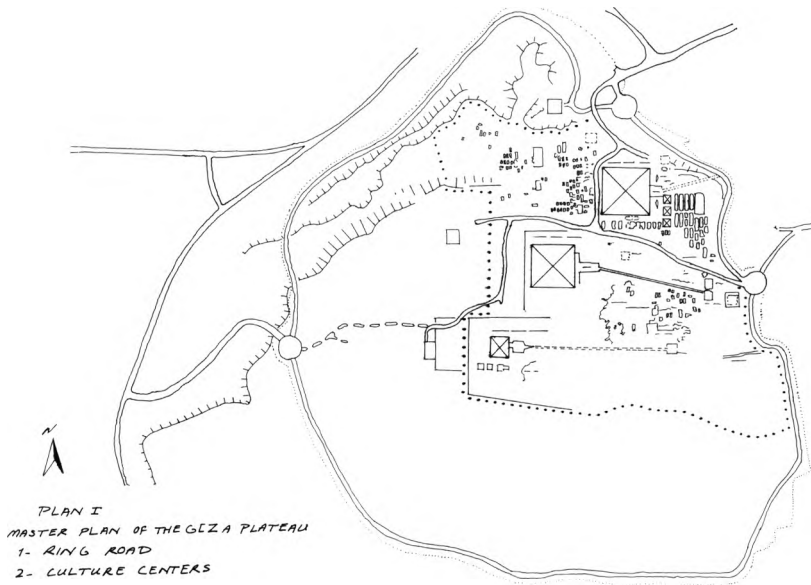


FIGURE 11. MASTER PLAN OF THE GIZA PLATEAU. THE RING ROAD IS SHOWN AROUND THE PYRAMIDS. ONE OF THE TWO CULTURAL CENTERS IS SOUTH OF THE THIRD PYRAMID, AND THE OTHER IS AT THE ENTRANCE OF MENA HOUSE.

cording to the rotational plan. In any case, the magic of these great monuments is best experienced from outside rather than by visiting their cramped interior burial chambers.

On October 1, 1998, we moved all the camels and horses to the desert south of the pyramid of Menkaure. The new stable is already complete, and nearby will be the office of the tourist police so that they might control the animals. From here, tourists may ride with the vista of the pyramids in the background. Animals will not be permitted on the Giza archaeological site. Visitors will enter the site from Fayum Road, where we are planning a parking lot and a picnic area for Egyptians. This new area will contain all tourist activities and facilities.

#### 4 FUTURE PLAN

The final plan for the conservation of the Giza plateau includes a ring road around the Giza plateau that will contain all vehicles. No cars will be permitted inside the site. In addition, two cultural centers will be built to contain tourist amenities such as souvenir shops, bookshops, and educational facilities. An electrical transportation system will be built to take tourists through the site.

One remaining obstacle is the presence of modern structures in the path of

the access road that are postponing the implementation of the plan. We are in the process of solving this problem.

Exactly when this phase will be finished is uncertain, but it is the final phase of the site's management. Most importantly, after the completion of this plan, our work will continue as we conserve the tombs and pyramids and develop a conservation laboratory for the site. I am confident we will accomplish our goals.

## NOTES

1. Z. Hawass, The Pyramids, *Ancient Egypt* 168–190 (D. Silverman ed., Duncan Baird, London 1997).
2. Z. Hawass, The Discovery of the Satellite Pyramid of Khufu, *W. K. Simpson Festschrift* 379–98 (Museum of Fine Arts, Boston 1997).
3. See G. Reisner, *A History of the Giza Necropolis*, vol. 1 (Harvard University Press, Cambridge, Mass. 1942); Z. Hawass, *The Workmen's Community at Giza, House and Palace in Ancient Egypt* (Österreichische Akademie der Wissenschaften-Wien, Vienna 1996).
4. Z. Hawass and M. Lehner, The Great Sphinx at Giza, *Archaeology Magazine* (1995); Z. Hawass, The Great Sphinx: Date and Function, *Sixth International Congress of Egyptology*, vol. 2 (The Egyptian Museum, Torino 1993).
5. Z. Hawass, The Egyptian Monuments: Problems and Solutions 3, *Journal of Law* 105–117 (1995).
6. For the name Busiris, see J. Yoyotte, Les bousiris et les abousir de l'Égypte pharaonique I, *Comptes rendus du groupe linguistique et études-sémitiques* 8, 57–60 (1957–1960). The tomb of Debhen was recently opened to the public in March 1998.
7. Decrees were issued by the General Secretary of the Supreme Council of Antiquities to remove all these structures.
8. President Hosni Mubarak announced this decision to stop the ring road while he was visiting Luxor.
9. E. Johnson, A Reassessment of Conservation of Egyptian Monuments, unpublished paper read at the Seventh International Congress of Egyptology (Cambridge, UK 1995).
10. A group of scientists met in 1990 in Washington, D.C., to study the problems of the Egyptian monuments. Farouk El-Baz, one of the scientists, announced that groundwater is the main threat to the monument; he also observed that the high dam has not caused any rise in the water table.
11. See M. Lehner, J. Allen, and K. Lal Gauri, The ARCE Sphinx Project: A Preliminary Report, 112 *ARCE Newsletter* (Fall 1980); K. Lal Gauri, Deterioration of the Stone of the Great Sphinx, 114 *ARCE Newsletter* 35–47 (Spring 1981).
12. During this work a very important salvage archaeology project was initiated. While the pipe was being installed, we discovered the route of the causeway, the valley temple of Khufu, and a large Old Kingdom settlement covering about 3 square km. See Z. Hawass and M. Jones, The Discovery of the Causeway and the Valley Temple of Khufu, The Set-

tlement at Giza, *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* (MDAIK) (forthcoming).

13. W.F. Petrie, *The Pyramids and Temples of Gizeh*, with a chapter update by Z. Hawass. (Histories and Mysteries of Man, London, UK 1990)

14. The third pyramid was closed for a year and opened in March 1998. On April 1, 1998, the Great Pyramid was closed for eight months so conservation projects could be carried out.

15. Z. Hawass, History of the Giza Conservation, *Book of Proceedings* (EAO, Cairo 1993).

16. *Id.*

17. During the Getty Mediterranean Conference arranged by the Getty Conservation Institute in May 1995, participants visited Knossos and analyzed the restoration done by Arthur Evans. We saw a complete reconstruction of the site. Very little of the restoration was based on knowledge of Minoan palace structures; most of it was derived from Evans's imagination. We had a most interesting discussion when a colleague raised the question, if we found evidence now for the correct reconstruction of the site, should we destroy what Evans did, or leave it as is?

18. The conservation plan of the pyramids and tombs was made under Shawki Nakhla. Moustafa Abou-El-Kader, Abdou-El-Hamied Kotb, Nievien Moustafa, Amal Samoul, Mahmoud Afifi, Alaa El-Din Shat, Mansour Boriak, and Mohammed Salah, from the Department of Antiquities at Giza.

19. During the Getty Mediterranean Conference, many people criticized the cover and building constructed over the mosaic at Piazza Armerina. I was one of those people who did not like the shelter. Similarly covering the Sphinx was not appropriate, so we must look for other solutions to conserve it. However, the shelter of Piazza Armerina has kept and preserved the mosaic.

20. This plan was initiated in 1989 and is still in use. Also, the quarry owners have been given a period of time to look for other quarry sites further away from the pyramids.

21. F. Ismael, ed., *Book of Proceedings: The First International Conference on the Sphinx* (EAO, Cairo 1991).

22. Governor Omar Abdou-El-Akher made this decree, and Reda Kamel, the architect, has been planning the new station since 1988. The subsequent governor of Giza, Abdel Rahiem Se-hata, established a committee to meet every Thursday. This committee created an action plan to clean up the area around the plateau. The results of this plan are the most significant achievements for the site.

23. Ironically, we were lucky when the Sphinx lost a piece of its shoulder in 1988, because the media focused much attention on the Sphinx and the pyramids. As a result, President Mubarak visited the Sphinx and the site and spoke. Also, the Minister of Culture took an interest in the making of the master plan for the site.

24. Thanks to David Goodman and Mark Lehner for their cooperation in preparing this map.

25. This plan, prepared by the Sabour architectural firm in Cairo, was the only master plan studied. It required amendments to include plans for the maintenance and protection of the site.

26. Anyone who intends to work on a master plan for the site should in turn work and discuss site problems with archaeologists and architects at the site, officials in tourism, local officials of

the Giza governorate, other tourist authorities, the tourist police, representatives from the villages, and representatives of the horse and camel owners.

27. G.A. Reisner, *A History of the Giza Necropolis*, vol. 1 (Harvard University Press, Cambridge, Mass. 1942); A. Abubakr, *Excavations at Giza, 1949–1950* (Cairo University 1953); S. Curto, *Gli scavi italiani a el-Ghiza 1903* (University of Rome 1963); G. Fisher, *The Minor Cemetery at Giza* (University Museum, Philadelphia 1932); H. Junker, *Grabungen auf dem Friedhof des alten Reiches bei den Pyramiden von Giza*, 12 vols. (Austrian Akademie-Wissenschaften, Vienna 1929–55).

28. We started work in the western field and discovered a shaft in which we found a head with a mask; see Z. Hawass, An Unusual Plaster Mask Found at Giza, *The Followers of Horus: Studies Dedicated to Michael Allen Hoffman, 1944–1990* 327–336 (Renée Friedman and Barbara Adams eds., Oxbow, Oxford 1992).

29. See G. A. Reisner, *Mycerinus: The Temples of the Third Pyramid at Giza* (Cambridge, Mass., 1931).