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University of Algiers 2 Abu al-Qasim Saadallah
Institute of Archeology



**A pedagogical publication based on the standard of
introduction to archaeology**

**Archeology
its concept, fields, specializations)
(and branches**

Directed to first-year students with a common core of archaeology

Prepared by Dr. Meftah Atmane.
Professor Lecturer, Class A.
Department of Archeology - Institute of Archaeology.

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Introduction

This pedagogical publication includes a series of concepts and definitions in the field of archaeology, prepared in accordance with the official program scheduled for first-year students with a common trunk specializing in archeology and students in the humanities, LMD system.

This booklet aims to present the most prominent scientific and historical concepts. For archaeology and highlighting the important role and how to use it by determining the nature of the archaeological material and its properties, in a way that allows the student to learn about the history of ancient civilizations and their most important social, religious and economic aspects.

Chapter One: The Concept of Archeology

Introduction

The definition of any science includes specifying the nature of the topics of study in it, the questions that it attempts to answer, and the type of material that is collected, and all of this is determined in light of the goals that this science aims to achieve.

1- Definition of archaeology

If we look at the term archeology or archeology (Archeologie), from a linguistic standpoint, it is a word of Greek origin that can be literally translated into: Archeo, which means ancient, extinct, or obsolete, Logie, which means science, and thus the meaning of the term is in In general: the science specialized in studying antiquities or ancient antiquities.

Therefore, it can be said that it is an independent science with a special entity, methods, and methods in research, or as an art that uses technical methods to collect and analyze material, and therefore it is a type of science and art together.

And examples of definitions:

The definition of Taylor 1948: 'Archeology is not a history, but it is an independent science, consisting of a curriculum and a set of specialized technical methods for collecting and producing the cultural material.'

- The definition of Hammond 1963: 'The scientific study of ancient monuments or the material remains of ancient human life, and therefore it includes all aspects of ancient culture from building, art, industry, pottery and history' '

- The definition of Leipke: 'A science that is objective and investigates the results, then tests it in the field of study.'

Hull definition: 'It is a science and art at the same time, as it must be an organized scientific branch, researchers trained real scientific training in a specific topic is the rest of the old humanitarian activities. It also must be the art that deals with these remains in a scientific way, those remains It is found by excavation on the ground, where it was buried and has been spreading as a substance for the human race.

The definition of Fagan 1972: 'It is a set of curricula and technical methods for the study of man in the past, whether it is knowledge or art'...

Archeology can be defined as a science that studies any evidence that can help them understand the lives of people who lived in ancient times. The archaeological evidence ranges from the remains of a large city, to a few fragments of stone pieces, left by someone who was making stone tools long ago.

2- The history of archeology and its origins

There is no doubt that archeology had begun in its first phase with glimpses of admiration and fascination that led to a kind of description and commentary by some travelers and amateurs in many countries of the ancient world. Then this was followed by its second phase with the efforts of some researchers who persevered in collecting original texts. of ancient civilizations and the extraction of antiquities from their archaeological sites

by the hands of some scholars, and these bullets ended in its third stage with the processes of analysis, reasoning, and reconstitution of these antiquities and their texts within a framework of scientific commitment and responsibility for history. Archeology then penetrated among the landmarks of ancient civilizations, especially the Greek, Roman, Byzantine, Gothic, Germanic, Saxon, Eastern, Western and other civilizations, and through this endeavor, sometimes with intent and sometimes in agreement, it ended with the statement of the unity of humanity and the brotherhood of human beings. Civilizations, despite the differences in races, languages, and locations, because science and art have no homeland or borders, and this was one of the most important achievements of archaeology.

Whatever the case, archeology is one of the most modern sciences practiced by man, and it began with regard to the ancient East, which is considered the oldest civilization known to mankind. Since the fourth millennium BC, three main civilizational centers have appeared in it, the first in Egypt and the second in the countries of Between the two rivers and the third in the Archipelago Sea, especially on the island of Crete.

This knowledge was in this period with simple pieces of pottery and some tools made of clay and the like, or some primitive decorations at the best of developments, and there is Greek and Roman archeology, which is concerned with the

architecture and arts of these two eras, which is unparalleled in terms of beauty and decoration. . In fact, the era of the Western Renaissance and the growth of the human tendency to deeply admire ancient times and their material heritage, architecturally and artistically, had the greatest impact on the emergence and development of archeology. From them began the serious search for the past, and then the true love of antiquities began to dominate the people of that era. He began to extract ancient antiquities from the ground and began displaying and arranging them inside a special hall, which was the nucleus of what was later known as museums. Hence, it can be said that the 17th and 18th centuries witnessed the true beginning of archaeology, especially when many travelers visited Egypt. And the Middle East and wrote about its history, customs and effects.

This beginning remained restricted to what was stated in the Old Testament and the position of the church, which focused on Christian religious literature rather than arts and antiquities, and with the beginning of the 19th century, archeology began to take another, more modern form. It caused a revolution in human knowledge of its history and development, and civilizations were discovered that transcended their roots, which were limited to the heritage of the Greeks and their civilizations. This science gradually expanded and became organized, and even had organized bodies of academies, institutes, and

universities, which created continuous competition that necessarily led to a rise in the level of science, the multiplicity of its scholars, and the spread of its travels, publications, and excavations.

3- The importance of archeology

The importance of archeology lies in:

- Its significant contribution to reviving many histories of unknown nations, ancient civilizations and various human experiences, which made it a permanent and ongoing goal of supporting historical writings with material evidence (archaeological material evidence).
- There is no doubt that many of the beautiful and precious antiquities acquired by various antiquities museums in various parts of the world owe their preservation and existence to archeology in the field of excavation and restoration. The more scientific discoveries expand, the more people's ability to understand themselves and themselves increases. Their civilizations.
- Archeology has the credit for making thousands of years an open book after they were something mysterious and unknown, and this is due to the discovery of written documents that record human creativity in various fields of architecture, culture, arts, faith, and others.

- If it were not for Excavations and excavations carried out by archaeologists, through which it was possible to learn about civilizations.

4- Fields and fields of archeology: Its fields of study can be divided into several types, the most important of which are:

A - Artificial finds

Artificial finds are those materials made by humans and can be transported from one place to another without causing a change in their appearance. It includes materials such as arrows, pots, and beads. It may also include - for a society with a written history - clay tablets and other written records. According to Taylor, the artifacts are the basic evidence that anthropologists rely on in studying the cultural life of primitive peoples, as they are considered among the most important cultural deposits. The archaeological research conducted in Algeria in the Tebessa region resulted in the history of man being traced back to the Paleolithic (Old Stone Age) era, through the discovery of tools made of stones, flint, drawings, and greys of various sizes, in the caves of Qastal, the White Water, the Galilei Valley, and Jebel El-Dukkan.

B- Phenomena

Phenomena are archaeological finds that appear on the surface of the Earth and can be observed with the naked eye and consist mainly of houses, tombs, irrigation canals, and many other structures, built by ancient peoples. Unlike tools,

phenomena cannot be separated from their surroundings, without changing their form.

C - Natural finds

Natural finds are natural materials that exist alongside tools and phenomena. These finds reveal the way people in ancient times interacted with their surroundings. Natural finds include, for example, seeds and animal bones, but also include chemicals, gases, and even organic materials mixed with the soil.

We conclude by saying that archeology is the science of investigating the material origins of human civilization, and therefore it is the science of loyalty to the ancients and the keenness to trace the path of development that human civilization took in its past eras by extrapolating material evidence and from the heritage of these eras and extracting cultural and scientific values. Aestheticism is the result of everything created by human instincts, feelings, and sciences, and everything that has been formed as an embodiment of his beliefs and arts. It is also the science that studies antiquities and their backgrounds because, in its concept, they are tangible facts that speak in the language of their people and their time, both positively and negatively, and are inseparable from their being in time and place, contemplation and imagination, even if they are naive, unwritten antiquities. It can be said that archeology is The science of studying human life according to

evidence. Therefore, archeology is an important vital science within anthropology, which is divided into three main branches:

- **Physical human science:** which takes care of studying the development of biological times, human strains, human races and characteristics.
- **Cultural human science:** which takes care of the study of human history, stability, development of his life and culture.
- **Archeology:** which is used to study the civilization of man in its ancient times, evolution and decay in all areas of intellectual and material creativity of this human being.

5- Specializations and branches of archaeology

Archeology is divided into a group of specializations according to time periods, and they differ from one region to another, according to the historical periods and civilizations that have known them:

5-1-The specialization of prehistoric archaeology: where it is studied through antiquities and remains since The emergence of man until the emergence of writing is divided into three branches: A - The Paleolithic Age: hundreds of thousands of years ago until 12,000 years BC.

People used natural stones, animal bones, tree branches, and wood to fulfill their daily needs, often inside caves and grottoes. The flint stones that he thinned would be used to become knives and stone tools of various shapes, such as axes,

hammers, chisels, and saws, all the way to the sickle, arrow, and shovel for hunting. With the discovery of bone, wood, and ivory, humans resorted to using them as materials for constructing weapon grips and simple agricultural tools. Perhaps the most important discovery at this stage of time was fire. Perhaps it was discovered by chance by observing meteors falling from the air, lightning, or natural events.

Among the clearest traces left by Paleolithic man are the drawings on the walls of caves of animals such as the wild bull, mammoth, horse, etc. (rock drawings) that were engraved with polished flint machines.



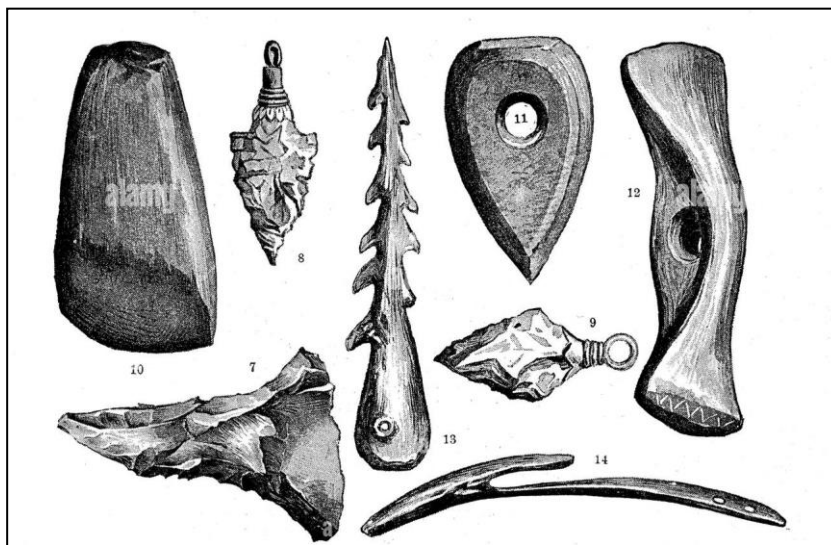
Photo 2: rock inscriptions for a prehistoric period On the soul, the ancient Stone Age (the ancient Stone Age) returns



Image 1: Fdm tools for hunting and defense.

B- The Mesolithic Age: between 12,000 years BC and 6,000 years BC, and it was said 9,000 years BC.

This era embodies the civilizational stage that man went through and became farmers and fishermen, so he began, in addition to... Hunting, relying on seeds, planting, storing grains, domesticating animals, and building primitive residential centers of huts, and this stage was called agricultural civilization.



Picture 3: Agricultural and hunting tools dating back to the Middle Stone Age

C- The Neolithic Age: between 6000 years BC and 4000 years BC.

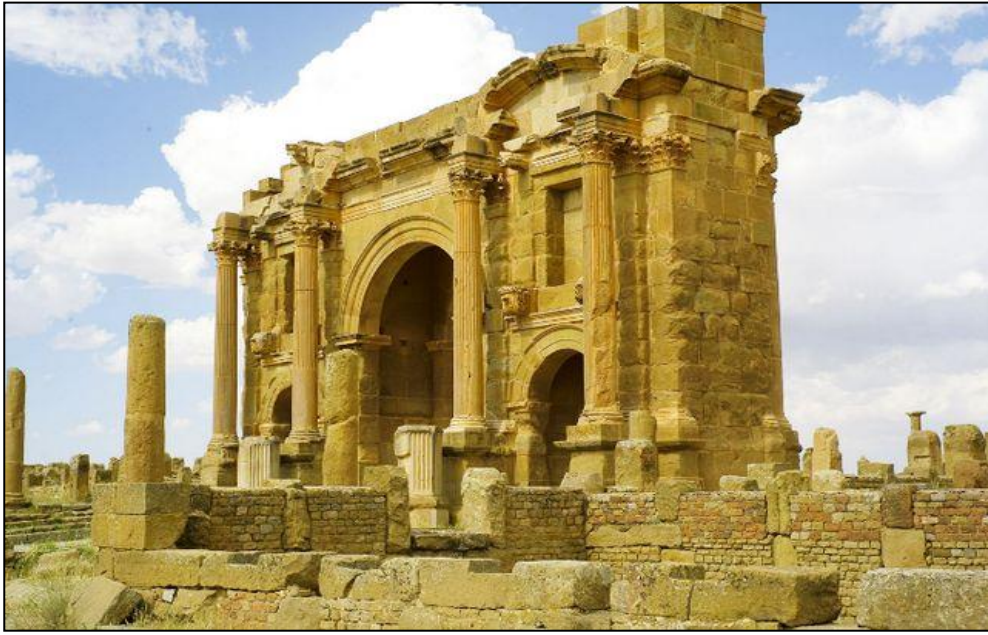
This era saw the invention of ceramics, spinning, decoration on ceramic tools, construction with all its requirements, the manufacture of boats, and the development of ideological concepts and sciences. The most important relics of this era

and its remains were discovered in Lebanon, Syria, Palestine, northern Iraq, and in the northern regions of the Near East. The first writing appeared in 3500 BC, and it first came from Sumer and spread in Mesopotamia all the way to northern Syria. And with writing, historical eras and history begin.



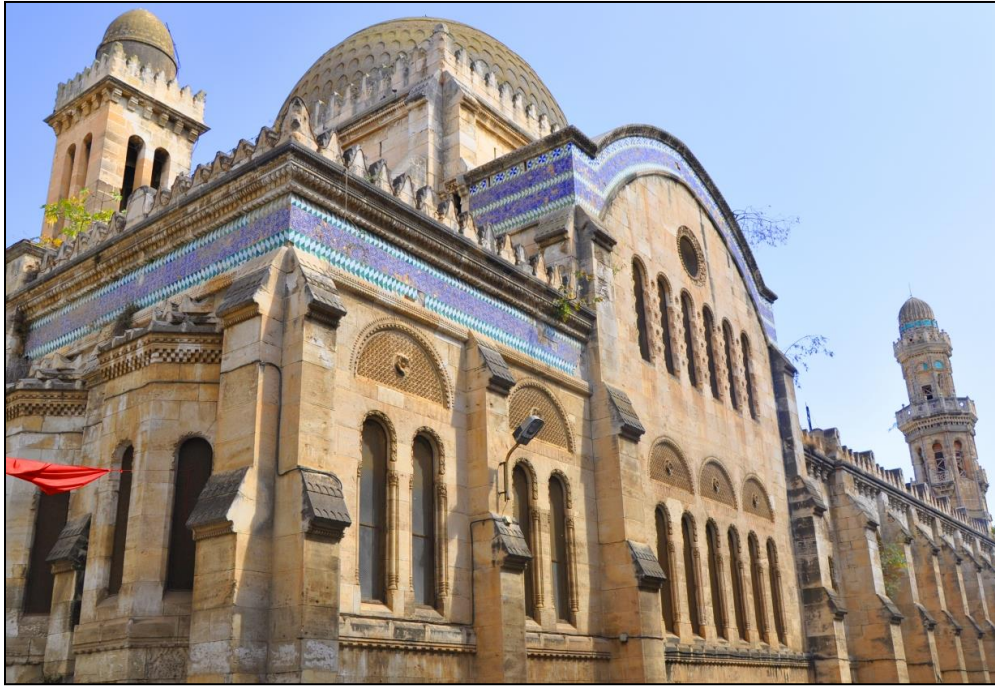
Picture 4: Neolithic rock art

5 -2-Ancient Antiquities Specialization: In this branch, the antiquities of ancient civilizations are studied, starting with the Pharaonic civilization, Mesopotamia, Greek civilization, then Roman civilization, in addition to the rest of the other civilizations in various parts of the world.



Picture 5: Archaeological monuments in the ancient period (Roman civilization)

5 -3-Specialization in Islamic antiquities: This specialization studies the various antiquities left behind by Muslims, from the advent of peace until the end of the Ottoman Islamic Caliphate. Sometimes these antiquities are divided into two periods: the Middle Ages and the Modern Ages. In Europe, this corresponds to the Middle Ages and then the Renaissance or Modern era.



**Photo 6: Archaeological monuments in the Islamic period
(Ketshawa Mosque - Ottoman civilization)**

5 -4-The specialty of maintenance and restoration of antiquities: This specialization studies the most important classical and modern scientific and applied techniques in addressing antiquities and archaeological discoveries and preserving them for future generations.

Chapter Two: Archaeological sites

introduction

Archaeological research is considered the only way to help interrogate aspects of life in ancient and prehistoric societies, and to seek to know how civilizations developed, from determining the place and time of the historical event or archaeological site to contain the remains of the people around whom the event took place or the type of human activity that revolved around it. Search.

1- Definition of the archaeological site

It is the basic unit of research in archaeology, where digging and excavation begins for physical evidence of human activity. The site often contains the remains and remains of defunct societies that indicate to us the type of life that prevailed, especially residence sites and sites. Work and daily activity, which is an important source that sheds light on the life of the group that lived in these sites and determines its distinct activity. The site may reveal a single material complex, which indicates that it was once inhabited by one group, and multiple elements may be found in it that indicate On repeat stays of different groups. The Earth is the place where a person leaves traces of the activities he has undertaken and the life he has lived. Indeed, the surface of the Earth, especially in countries where there were concentrated settlements such as Britain, is

considered a scene of human activity and its effects, the degree of preservation in which country depends on geological factors such as the type of Soil, climate, and human factors such as the development of agricultural work, the extension of urban sites, and the necessities of war and defense.

Also, the results of archaeological research that rely solely on what excavation reveals of ground materials, antiquities, or valuable crops may be very misleading results because there are other significant remains or antiquities, such as the remains of houses, tombs, and temples. In many cases, excavation reveals the error of previous assumptions. However, when sites are excavated, they always prove to be more complex, contrary to what their surfaces indicate.

2- Types of archaeological sites

Archaeological sites differ according to their nature, the civilizations to which they belong, and the history of their times. Each archaeological site has its own advantages that differ from one site to another and from one country to another. The most important of these sites are:

2.1 Caves: They are rock shelters. Nature, which abounds in mountainous areas, and whose presence ancient man benefited from, resorting to it to protect himself from the enemy and the harshness of the natural environment. The ruins inside the caves are a special type of archaeological site consisting of successive layers of different types of soil, each type of which

was collected in geological ways over a very long period of time, and in this soil all the materials left by the cave dwellers are found



Picture 7: Caves and archaeological caves

2 -Archaeological hills: It is a well-known fact that people from ancient times chose to build in one site more than once, if it was difficult to leave the site because it costs a lot of money and effort to rebuild, and all that happened was to prepare the land so that it was suitable for erecting the new building and with Human evolution develops and rises. Then the site is left for many reasons. Nature helps bury the old buildings and creates mounds and hills above them covered with dust and plants. These hills may rise to more than 40 meters above the level of the adjacent land in the form of successive layers, and the upper layers are the buildings that were built last. .

The rubble accumulated in these hills is distinguished by the dark color of its soil when compared with the surrounding natural soil, and pottery fragments and tools made of stones, bones, metals, wood, and money

are scattered on its surface. Their presence on the surface of the hill indicates that they are present in its interior.



Picture 7: An ancient hill

These sites sometimes appear as if they were unstable villages inhabited by ancient man when he emerged from the caves at the end of the Pleistocene era. The developments that occurred in the life of ancient man helped in the organized settlement of such villages, whose houses were built of mud, reeds, and tree branches. Then mud, bricks, and hard stones were used later.

Other times, these sites appear large, as they represent small cities that first appeared in the era of the dawn of writing, then they became clear landmarks in the era of the dawn of dynasties, where one city became a self-existing kingdom with its own residents and its owners and its own laws, the Sumerian

city-states of Ur and Eridu, and the Greek city-states such as Athens, Sparta, and Thebes.

The sites of the cities are distinguished by the remains of their numerous buildings, such as houses, temples, palaces, sports arenas, markets, public baths, and other facilities such as churches. And the mosques that were built in later eras.

3- Castles and fortresses: Castles and fortresses were built in most cases on the borders of states and countries, and their construction is distinguished by their massiveness and the presence of high walls and impregnable towers because they were originally built for military purposes, and we sometimes find deep and wide moats around them. We mention among these castles the Petra Castle, which It was built by the Hurrians and later settled there by the Nabataeans at the end of the second century BC. Over time, Petra became the main city on the caravan route between the Levant and the Hijaz.

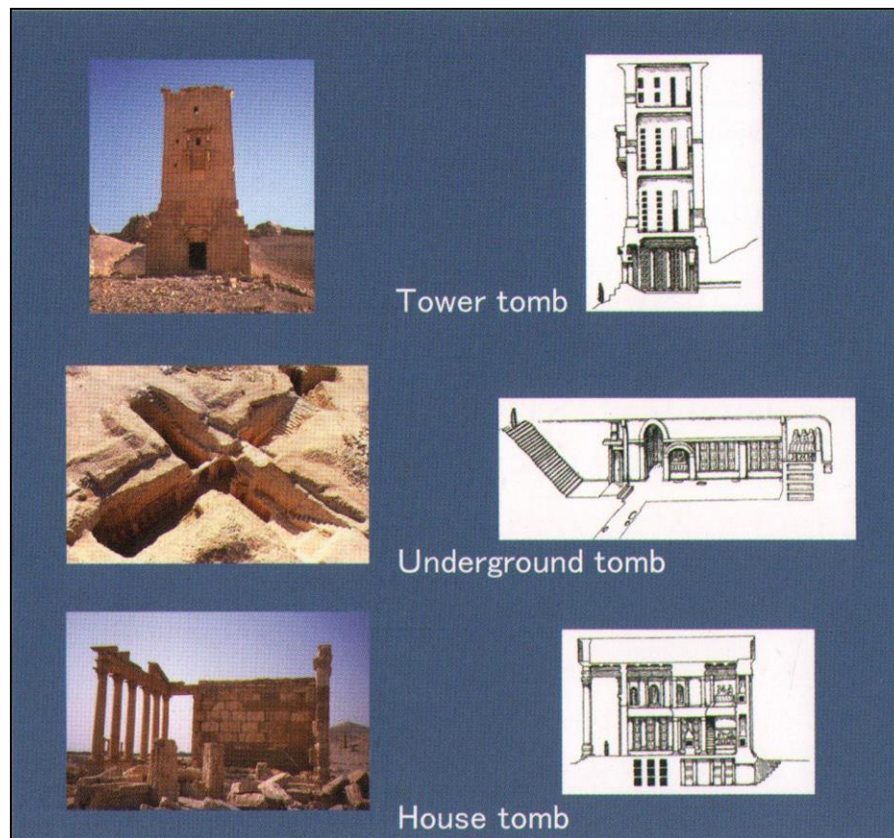
The Parthians built a fortified castle in the city of Hatra to protect the borders of their empire neighboring the Roman Empire. Hatra was famous for the strength of its walls and the strength of its fortifications, as it was surrounded by an external wall built of mud that reached a diameter of 3 km. It is followed, after an open courtyard, by a huge main wall built with well-groomed stones. Rectangular towers were built into this wall, and it was surrounded by a moat that reached a width of 25 feet. On the borders of their vast state, the Arabs built many

forts and castles that were used for military and other religious purposes.



Picture 8: Ancient castles and forts

4 - Cemeteries: Cemeteries include different types of graves located inside or outside villages and cities and are distinguished by buildings visible on the surface of the earth, such as pyramids, towers, domes, terraces, and flat tombstones that are not distinct if they are flat on the surface of the earth. Some of the burials are in the form of sarcophagi or pottery jars buried inside the ground, which we need to uncover with the diggers' shovels. These burials may be inferred through historical books that talk about them, or through archaeological evidence found on the surface of the burial ground or near it.



Picture 9: Types of archaeological burials

5 - The memorial: are the signs that kings, leaders and heroes have made to record works that deserve to be immortalized, such as victory in wars or some of the timeless exploits that they have done, and for example the memorial known as Huston Stone located on top of a mountain of mountains between Karmansha and Hamadan in Iran And this monument belongs to the Persian king Dara I, without his war actions that ended in eliminating the local revolutionary movements that occurred during his reign, and this news was recorded in the Mesmari linear, Al -Alami and Babylonian.

And (Sanaaq) recorded the first kings of the fourth dynasty in Egypt on a rock sculpture in Sinai, the news of his triumphant campaign that he sent there to eliminate a rebel tribal head on the central authority. And there is a lot of memorials distributed around the world, there is no room for all of

them, including the memorial on the banks of the dog in Lebanon, the most important of which is the monument that records the history of .Lebanon's independence



Photo 10: Archaeological memorials

6- River terraces: Since ancient times, man has settled on the banks of rivers and built his settlements near them. It is known that as the river deepens its course, the valley narrows and the water recedes on both sides, which means that man is forced to follow the river's waters to stay close to it, leaving behind his waste in his old settlements, and thus we see the oldest The ruins are far from the modern course of the river, and its level is higher than the current level of its valley. The best example of

this is the terraces of the Nile River, in which traces dating back to the ancient Stone Ages were found.

Chapter Three: Methods of discovering archaeological sites

- Sometimes the site is self-evident, for example the remains of ancient cities, because they were built on several layers of ancient dwellings and ruins, and they were also in the form of high hills on the level of a flat plain.
- And sometimes The site is discovered accidentally through erosion, the explosion of an explosive mine, or as a result of digging in construction sites or extracting stones and minerals, or when laying roads or agricultural works.
- There are sites that cannot be seen directly, but require an aerial view, and for this reason aerial reconnaissance is used in Some survey in archaeology.
- discover these remains, and in theory it must Some evidence remains on the surface. In many cases, made tools may appear on the surface and reveal the presence of the site.
- The archaeologist often focuses his activity in sites where there is concentrated and prolonged human activity, where man has been able to exploit the environment, leaving behind a lot of evidence.

Submerged underwater monuments:

There is no doubt that bad weather factors have and continue to sink many ships that roam the seas and oceans transporting goods and products between countries. In ancient times, these

ships carried the products of Egypt, Syria and Mesopotamia. And Phenicia to the islands of the Mediterranean and Greece, in addition to that, many ancient ports were submerged and swallowed by water, and many ships sank during war battles to the bottoms of the seas and oceans, and as a result of all of this, many ships and antiquities in them sank.

This remained the case for a long period of time until the discovery of underwater antiquities became an important field of archaeological work. This is evidenced, for example, by the French-Egyptian attempts to salvage Napoleon's fleet that sank in the waters of the Gulf of Abu Qir during the war battle that took place in Alexandria. Between him and the English fleet, and what is also indicated by what is happening on the island of Crete to uncover its ancient port in the hope of reaching knowledge of the relationship of this island with the countries of the ancient East, especially Egypt and the Phoenician coast, through what was found of thousands of pieces of Egyptian and Phoenician pottery, which include... On the characteristics and advantages of local products for each of these two countries.

However, detecting submerged antiquities under water is often met with various difficulties, the most important of which is diving to great depths with the devices for this detection, which requires the strength and skill of divers, in addition to the difficult rocky areas that the diver encounters. Sunken antiquities are often found. Next to and above these areas,

which helps a lot in destroying and destroying them. Seeking the help of fishermen and identifying what their nets sometimes bring in, such as pottery, bronze vessels, or the like. However, the matter does not stop at these reliable details. Rather, it has reached the stage of using modern technological devices for these sunken relics, through which it is possible not only to identify Their locations and even the extent of their immersion in the bottom mud. These devices include audio devices, magnetic measuring devices, metal detectors, and the like.

How to identify buried archaeological sites:

Antiquities researchers have taken advantage of some scientific methods and the use of modern science and its applications to detect antiquities buried in the ground or submerged under water without resorting to manual excavation. The most important of these methods are:

1 -Aerial photography: in identifying archaeological sites, especially clay buildings, by determining their geometric drawing by identifying the plans of these buildings, which are signs that appear in the soil and plants and differences in shade, for example, the speed of growth of plants and their difference in color with other plants. Evidence of the high percentage of humidity in the ground under these plants, which is evidence of the presence of those archaeological sites beneath them, such as brick buildings or mud walls. It can be said that aerial photography was, and still is, helpful in

determining the architectural drawing of buried archaeological buildings, as well as determining the general plan of the archaeological site.

1 -Cosmic ray imaging: The universe in which we live contains thousands of millions of small particles that have very huge energy (millions of billions of volts). They also fall on the surface of the Earth from outer space regularly. They were discovered by Victor Hanes in 1912 AD and were called Cosmic rays in 1923 AD. This method was used for the first time in photographing the second pyramid (Khafre's Pyramid 2600 BC). The aim of this was to identify the passages and rooms inside this pyramid that had not yet been revealed, and by using cosmic rays and their advantage in having strong penetration into solid bodies. It has a high density, but it gradually decreases as its penetration extends

And what was inside the target was revealed by the pyramid by measuring the amount of cosmic rays that permeate the stones of this pyramid, especially since the thickness of the stone in which these cosmic rays pass in the event of corridors or rooms less than in the deaf parts (the amount of cosmic rays in force to these rooms or The corridors are larger than their quantity in other directions or deaf stone.

And the cosmic ray of the pyramid has reached:

- The burial room inside the pyramid is deviated from the northeast 20 meters from the base center

- Not finding any rooms or corridors inside the pyramid, especially the upper third of the pyramid.

Thus, it is possible to uncover the riches, treasures, and other antiquities underground without resorting to excavation operations.

3- Chemical analysis of the soil:

The presence of humans and animals in any human habitation site leads, after a long period of time, to a change in the chemical compositions of the soil of this inhabited site from other sites that did not have its presence, and that is due to animal waste and waste. Dumped into the ground, which leads to it being enriched with some mineral elements such as phosphorus, calcium, nitrogen, and carbon, which are considered evidence of the presence of humans in it, and chemical analysis of soil samples helps to identify archaeological sites (to sample these four elements, provided that samples for analysis are taken from different places and At regular distances and in perpendicular directions, so that we can roughly determine the boundaries of the area that has been occupied and exploited by humans, instead of dispersing efforts to excavate a vast area with no goal other than its archaeological phenomena.

4- Examination of pollen grains:

It is possible to determine the types of plants that were growing in the soil during their ancient times through the process of microscopic examination of pollen grains, due to their ability to retain their properties in the soil for long periods of time.

The transfer of pollen grains between plants through insects and birds, especially the wind, by secreting them into flowers. The male seeds produce large quantities of these seeds in order to ensure that they reach the female flowers before most of them fall to the ground during the fertilization process. These seeds then decompose in the ground, unless they fall into moist clay soil or acidic or charcoal soil, as they fossilize and can easily be identified under the ground. Microscope.

It can be said that pollen has benefits in the archaeological field, as it can be:

A- The presence of pollen in the soil that a person planted is evidence that the city that the farmers inhabited is close to this region, and therefore their graves may be next to it.

B-Learn about the type of plants that have grown in this soil contains the possibility of identifying the prevailing weather conditions in that region. For example, the presence of pollen for pine trees is evidence of the cold weather, while the presence of pollen for the tiles, sting and oak is evidence of its warmth and helping it to grow.

5- Geophysical methods:

This method relies on the use of theories of physics to detect the geological structures of the Earth's crust and predict what is in the ground of archaeological treasures and others, and it can be limited to two methods:

A- Estimating the resistance of the soil to electric current: It is the first geophysical method used to detect antiquities buried in the ground (in 1946). This method depends on the variation of the materials buried in the ground in their resistance to the penetration of electric current into them. For example, hard rocks such as granite and basalt are distinguished by their resistance. It is higher than the resistance of limestone and sandstones, and this resistance is equal in soil of the same type. However, if traces of a different type of soil material are found in it in some places, the electrical resistance in these places will be different. Therefore, estimating the resistance of different parts in archaeological areas is It easily shows the locations of stone walls in muddy areas and between the locations of trenches or mud buildings in the desert land, and then the locations of archaeological buildings in the area can be determined.

B- Measuring the strength of the magnetic field: This method is considered one of the best methods used to detect antiquities buried in the ground due to its simplicity, the speed of its

results, and the possibility of detecting antiquities at depths of up to approximately six metres.

It relies mainly on measuring the strength of the magnetic field in an area Excavation using a magnetometer. If the soil is free of traces and has one nature, the readings of the device will be the same. However, if the soil contains various buried traces, such as pottery, burnt bricks, and metals, then the magnetometer readings will be unusual and indicate the presence of traces in it.

Here the workers divide the area into squares in which the magnetic field is measured at the intersection points, recording the normal and different results, and determining their locations and extent in the area - in most cases, the location of the effect and its general shape are determined for us—

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Chapter Four: Archaeological excavation methods

The archaeological drilling process is distinguished by its different ways from one location to another, and the most important of these methods:

1- The method of drilling the test: We open the test drilling in the inspection fun in different places of the site without having a specific shape and aiming to examine the soil to ensure its archaeological importance in preparation for the start of excavations or counting from it if it is not important.

2- The trenches method: open the trenches where there are small archaeological metacopia and the ruins of the teaching buildings. It is preferable that the trench does not extend in one direction, and it is advisable to start the pits in two cross -places (+) or meet with one point (L) and the most productive hotels is what was in the form of (S) because the pits in it extends over several directions. The drilling in trenches in the form of connected or consecutive squares can be connected to it later if it is fruitful.

3- The terracing method: This method is followed in mountainous areas with hard soil, where the slope is steep, and excavation is done in a specific area for a distance of ten meters in length, half a meter in depth, and half a meter in width. Provided that one side of this area is kept straight and level to observe changes in the color of the soil and the type of construction.

Then another area is dug next to the first area and in the direction of the slope of the hill, with the same specifications. And so on until reaching the original land. The excavation area appears in the form of successive terraces arranged one above the other from top to bottom.

4- Unit method: The excavation process, as we mentioned previously, is carried out using interlocking squares, and excavation begins from the surface of the earth to the virgin soil gradually, in layers of homogeneous depth, whose depth ranges between one and three feet. Upon

completion of excavation in one square. The squares are moved to another square adjacent to it in the same way, even to the virgin soil as well. Then these small holes become large holes until all sections of the site are excavated.

This method helps to control the layers and notice changes in them and is suitable for use in plain areas where loose soil is available.

5- Building method: This method is used in sites of ancient villages and cities with a large area and complex structure, where the ruins of residential houses, palaces, places of worship, and other facilities are available.

Excavation begins in the place where these monuments are prominent and clearly visible. Or when it is found under the dirt until it reaches its end, and this depth is considered one layer. It is characterized by the presence of a wall or the presence of the remains of a house or temple.

These remains are called the first wall, first house, or first temple instead of the first layer. The end of these wastes is revealed when reaching their bottom, which is characterized by the hardness of its soil and its dark color or its tiled stones. Then the digging continues until the bottom of the building wastes that are found under the wastes of the first buildings to reveal the wall, the house, or the second temple, then the third, and so on until the virgin soil that is devoid of traces.

Digging in such sites requires precision, patience, and slow digging, because sometimes the excavator needs to search for a wall built with mud that is difficult to distinguish from the surrounding rubble, especially the soil next to the wall is the same clay as mud. The excavator may demolish this wall without rising from it, as happened in many cases. Ancient archaeological sites in Egypt and Iraq.

These remains are called the first wall, first house, or first temple instead of the first layer. The end of these wastes is revealed when reaching

their bottom, which is characterized by the hardness of the soil and its dark color or its tiled stones. Then the digging continues until the bottom of the building wastes that are located underneath. Ancient cities often take the form of a high hill of rubble, and the best way to clarify the features of these cities is Excavate within it, and it is preferable for the starting point to be in the center of the city, because this center represents the maximum height of human habitation. Upon completion of the central area, optional excavations are opened in different directions to search for the rest of the city's facilities and walls, which are considered among the most prominent characteristics of ancient cities.

- Organized archaeological excavation

The goal of excavation until the end of the nineteenth century was to find archaeological artifacts with a high degree of artistic and material importance to display in palaces or museums, such as complete statues, wall sculptures, and gold and silver antiques.

The early excavators did not care With ceramics, pebble decorations, and small finds. Hence, it can be said that archaeological excavations in their early stages did not go beyond searching for important antiquities in the view of excavators in that period.

At the beginning of the twentieth century, archaeological excavations began to have other goals, other than searching for important antiquities, including elucidating some cultural manifestations or saving antiquities. Or to solve a specific problem or clarify ambiguous issues, in addition to training workers and students of archaeology.

This requires following organized scientific methods in excavation and searching for antiquities. Modern archaeological excavation begins from the surface of the earth to the virgin soil in gradual steps, covering all large and small antiquities and all other archaeological finds such as human and animal skeletons, plant remains, and agricultural crops. And stones and everything related to antiquities, directly or indirectly.

Excavation usually begins by removing the upper layer of soil that has accumulated due to natural factors over the years and covered the archaeological sites. The thickness of this soil ranges between half a foot and two feet, depending on the dryness of the area. And its humidity.

After removing this soil, the veil continues to the depth of approximately the foot, and at that time the pits take a horizontal trend to extract the effects from the rubble gathered in this engraved spot. And if you find archaeological materials in these rubble, their place must be adjusted, the necessary information is recorded and photographed, as it is found if necessary.

Then other ingredients are engraved in the same way and their effects are extracted and so on until the depth reaches about three feet, and then these rubble are considered a first layer, then the pits continue in a second and third layer until the virgin soil and the rocky bottom where the appearance of the effects stops.

In order for the excavator to achieve good results, he must observe the following matters:

- Maintaining the organization of the digging angles and making them as right angles as possible.
- Maintaining the flatness and uprightness of the walls.
- Maintaining the levelness of the floor.
- Moving the dirt from inside the hole. Continuously so that some small archaeological finds are not lost.
- Ensuring that there are no archaeological materials in the soil extracted from the excavations.
- Tightly wrapping the discarded archaeological materials in preparation for processing them later.
- Store all the archaeological materials belonging to one layer before starting to excavate the second layer.
- Record the archaeological materials extracted from the excavations as soon as they are found.
- Clean all the archaeological materials before sending them to the laboratory.
- Clean all the excavation machines after completing the excavations.

Captain of Old Buildings

Installing the ruins of ancient buildings requires skill and precision to highlight them, then excavate them to the original virgin ground. After completing the excavation and recording the necessary information, the process of cleaning is carried

out, then photographing, drawing sections and maps, and preparing those buildings for maintenance if they need to be repaired. That.

When excavating the ruins of buildings, it is necessary to determine the history of the building that it reveals, and it is not necessary to determine its age in years, but rather to at least determine the era in which the building was built with a written clay number, a historical document, or a coin found on the site's land. In this case, our knowledge Its history and cultural content depend on the succession of archaeological materials in its layers. This is in addition to the special features of each layer that shed light on the changes and developments that the building has undergone. Careful excavations and strong observations are sufficient to reveal clear evidence.

The best method for excavating such buildings is the method of interlocking squares, especially if the buildings date back to several cultural roles and extend one above the other. Excavators may encounter problems and difficulties in many buildings built with mud and mud. It may happen over time that the walls become mixed with the dirt surrounding them, especially if they are made of the same soil, so the excavator digs the walls and demolishes them unintentionally.

And it is possible to control This problem can be overcome by careful supervision of the digging, as the color and texture of the soil and the sound it leaves when it collides with metals and

axes are among the factors that help alert the excavator to distinguish it from what is around it.

Chapter Five: Generalities on Maintenance, Restoration and Antiquities Conservation

The restoration and maintenance operations of the effects of the scientific and technical processes that must be subject to many scientific studies that are deduced from the use of

modern technologies that can be employed and applied through conducting many examinations and scientific analyzes to identify the components of the effect to be restored, and the problems facing the effect to be restored Among the different manifestations and products of damage is accompanied by the analysis and scientific explanation for the causes of these manifestations and the extent of their connection to each other, and the various factors that helped spread them to be able to reduce and remove them by setting a plan or strategy of treatment, restoration and maintenance, using the appropriate materials and methods of the impact and its general conditions. And because the restoration operations must be based on a studied scientific foundations that have many scientific and technical procedures and precautions that have the ability to remove the aspects of damage affecting these effects. This, in turn, requires full knowledge of the nature of the effect and its components, and what has occurred to him of transformation and changes, and this is achieved by conducting multiple tests and tests on the effect in order to know the characteristics and compounds of the impact to be restored and maintained so that it does not use materials or materials in the restoration operations of the wrong use that returns As a result of damage instead of treatment, through an unwanted interaction or activity between the restoration materials and the components of the

effect, as well as through these analyzes and tests new facts can be detected related to the effect to be restored.

1.1 Conservation

A- Linguistic definition

The word "Conservation" is derived from the Latin word *Conservar*, which is composed of:

- **CON:** It means anchor, with each other - together,
- **Servar:** It means protection, rescue and preservation.

The word maintenance is the process of preserving and keeping the archaeological material (artifacts, buildings) for the longest period of time in the same condition that it was found.

B- Scientific definition

Maintenance is called the Applied and Research Acts to maintain the effects from damage in the present and the future without interfering with the original materials for them, which in turn focuses on two basic rules:

- **The rule of science:** intended to use most of the auxiliary sciences (physics, chemistry, geology ... etc) in the processes of diagnosis of damage and maintenance of the impact.
- **The rule of art:** We mean that those who deal with the maintenance of antiquities must be:
 - Fully aware of the technical development of the monuments to be maintained,
 - High technical skill and extreme proficiency during work.

1-2 Restauration: is concerned with restoration to restore the impact as much as possible to its original state while respecting the principle of the original materials (i.e. the ease of distinguishing between the restoration materials and the material of the impact), by getting rid of the manifestations of damage and its causes. The restoration of monuments can be defined as the set of applied works carried out by restorers either in order to protect the archaeological building from collapse or deterioration, or to repair damaged various art holdings.

1-3 memorization: (Préservation)

Conservation is all the methods used to prolong and prevent the fading of a part or all elements of the archaeological material of value and effect, whether historically or technical. This is with maintenance, monitoring and permanent diagnosis to protect it from damage factors, and this is by taking basic measures to build in its valuable form, including periodic monitoring such as the position of the site or the building under the oversight to ensure its condition, and this is by taking all the reserves necessary to prevent sudden collapses, and monitor the effectiveness of prevention factors, and the goal of This process is to prevent any new damage that may happen in the prevention system, and the reconstruction process is another measure of the retrieval of some of the truted past effects, whether due to natural or human factors, and there is another

measure known as the restoration of the similarity, which is an alternative to the idea of reconstruction but in the original meaning It means restoration.

Here we conclude that the term conservation in its meaning is more general and more comprehensive than the term restoration, although the term restoration is considered the oldest use in the field of restoration and maintenance of antiquities.

1-4 Protection

What is meant by the word protection in archeology is to stop damage to the building itself, and to remedy and treat dangerous symptoms, and includes strengthening, repairing and renewal, as well as aiming to ensure and achieve security for the archaeological site, by providing all appropriate conditions to ensure its continuation of life, by protecting it from the factors that cause damage, Like natural, biological and human factors such as theft, smuggling and sabotage, protection is not limited to resorting to providing what is called material security, but also goes beyond that, which is the intervention of the law, including national and global, which can play an adult and effective role in protecting sites and archaeological monuments This process generally comes at the end of all maintenance operations to avoid damage in the future.

1- The goal of maintenance and restoration

The supreme goal of maintenance and restoration is the archaeological sites in the first place is to hand over this cultural heritage to future generations, and this goal achieves a number of elements, the most important of which are:

2-1 The element of benefit: benefiting from the effects in all respects (scientific and cultural).

2-2 The element of durability: access to modern and good results through the use of the necessary techniques and materials for that.

2-3 Economy element: The material cultural heritage (antiquities) is one of the important elements in economic development.

3- The methodology of intervention in the maintenance and restoration process

The maintenance, as mentioned above, is a process of interfering with a set of means from which to extend the life of the impact for a long time if possible, for the purpose of handing it over to future generations by respecting its authenticity, and it is divided into two parts:

3-1 Preventive memorization: It is direct intervention on the ocean (damage factors) to reduce the dangers of deterioration and its speed.

3-2 Therapeutic Preservation: It is direct intervention on the archaeological masterpiece (damage products) threatened with disappearance.

4- General Principles of Maintenance and Restoration

Respecting and using some general rules and foundations in maintenance and restoration is a matter that must be available before proceeding to any interference on archaeological holdings, and these foundations had to be known because they represent the rules and limits that are the level of intervention, the most important of which are:

4-1 Diagnostic examination: What is meant by the collection of scientific, historical and cultural data for the effect before interfering with it, and that is intent to:

- * Determine the deterioration and damage of the effect.
- * Linking his environment and circumstances to put effective ways to intervene and maintain the impact.

That is, after completing the study of the most important damage factors that affect the material in the archaeological teacher or the teacher in general, and extract the most important real factors that help us to start re -consideration of the archaeological teacher, the most important element in this applied process, which is to diagnose the disease in itself, must be employed in itself And this is by determining the pattern of the disease if it is a biological chemical or human chemical on the material to be examined, and to determine the affected part in the latter, which results in a change in the face of the piece, and all of this comes only with knowledge:

- The quality of the affected matter and its chemical and metal formula
- The impact of cracks and cracks and its classification according to their position with the knowledge of the porosity strength and its true ratio on the material, in order to determine the water condensation once.
- Study the effect of climate and general weather (heat, moisture, pollution) as well as the percentage of salts on the material and its identification
- The biological effect on the material, knowledge of the majority of damages and the factors involved in this and their analysis is an accurate analysis of the method of disposing of it.

This diagnosis helps us to give additional indicators to know the quality of damage and determine the appropriate analysis to ensure the process, and all this raises a set of problems that depend first on the initial examination, whether on the public space such as a wall, for example, or the material in itself as stones or mortar, so it must be subjected to most of the time To a type of these examinations, including:

- The initial examination of the naked eye and notes.
- Photography examination before any processing process.
- X -ray examination.
- Infrared examination.
- UV examination.

- X -ray examination.
- GAMA rays, and are used to check thick damage.
- Speech analysis, and is used to know organic and inorganic materials.
- Chemical analysis to know the movements of the material to be studied.

4-2 Interventions Records: What is meant is to write down all stages of interventions by creating a technical-cultural file for the impact through drawing, photographs and detailed reports on the various parts of it, by identifying all the data on the impact, for example, but not limited to:

- Knowing previous interventions if they exist.
- Bring most of the schedules obtained, studying them and explaining most of the information that may be neglected, as it may not exist completely.
- Study the values and tools used in the past, by bringing the historical side.
- Determine the basic points of the launch in the process of re - consideration, by determining the part to be maintained, almost the time it is almost, as well as the materials used in the process, and the method of work.
- Providing the general conditions of the operation, including financial or qualified humanity.
- Knowing most of the previous operations regarding restoration in its real or random sense

4-3 Low intervention: Estimating the extent of the effect of the intervention process on the state of the effect and the search for Asliah and a curriculum in which there are no side and unwanted side effects.

4-4 Preventive Conservation: It is intended to provide appropriate conditions in order to avoid the repetition of interventions (reduce direct intervention on the effect).

4-5 Institating the effect of interventions: Searching for interventions through which the value of cultural property emerges with the ease of induction and the distinction between the impact and the subjects of interventions, with caution against observing the historical, technical and aesthetic teacher of the effect.

4-6 retroactive interventions: It is the ease of referring to the origin of the archaeological piece before treatment, with no effect of any effect that leads to damage or sabotage the external appearance of the effect.

4-7 Compatibility and suitability of the entered materials: that is, the materials used in maintenance and restoration are characterized by the same appearance and external form with the original impact material, in addition to their negative impact on the apparent and internal structure of the teacher in general (the materials entered in maintenance operations do not lead To damage the original effect).

5- Methods and stages of maintenance and restoration

5-1 cleaning

It is an important stage before any intervention process. In many cases the dust accumulate on the external surfaces of the effect and overlap in its pores, and the smoke can form a layer on it and can cover the surfaces of the effect with algae and ears.

Cleaning is the removal of the superficial cortex and dust deposited on the outer surface, and cleaning is not permissible unless the inner layer of the effect is sound or after its strengthening, and there are those who see that removing the outer shell is to remove the dandruff (the protection layer) and that the methods used affect the authenticity of the archaeological material And by removing this dandruff, part of the material will be removed with it, no matter how small

- * Preserving the original crust (La Patine)
- * Control the operations and methods of cleaning as much as possible, and not to leave materials that may cause new damage, whether they are cracks or other defects that may contribute to accelerating damage rates.
- * Cleaning salts from the vertical walls starts from top to bottom to avoid contamination of areas again.
- * Methods and methods of cleaning should be subject to a continuous evaluation before using them, so it should first make sure that the case of the effect allows this, and in the case of damage to the engraved or colored surfaces, it is possible to

use tonics appropriately or for deep permeation. condition . And cleaning is either partial or total, and in general the process is carried out at the level of the wall, ceiling, or brackets inside the teacher, or on the inner or outer surface, or both with us for archaeological holdings, it is a comprehensive process for all places, and there are special cleaning operations that require each substance each other For example, the stone material depends on the mechanisms that we summarize in the following:

- By rubbing
- by water sprinklers
- by condensed water
- by sand
- by pressurized clays
- by basal stabilizers

The latter depends on bicarbonate and chemicals that remove the gel of limestone and helps to dissolve the water and are more effective.

As for the sandy or microscopic method that depends on a tool that pays a very accurate sandy package by special pressure, which allows the removal of the precipitated inch is not subject to decay and we find all this in the arches, and this is to restore consideration to it even though this process does not leave a negative impact on the material.

But if it is fragile, it depends on the use of artificial or termic satellites, and there are other methods that depend on materials that we summarize later to remove salts of all kinds.

Also, the process of removing mold, algae, other rationales, and others exposed to the archaeological monuments due to the harshness of the atmosphere, as well as the natural process, such as wind, rain, etc., which leaves outlets inhabited by the latter depends on a group of anti -molds, germs and fungi known, and among the known gases In the used market in this f

- Hydrocyanic acid gas.
- Carbon disulfide.
- Ethylene oxide.
- Sulfur fluoride.
- Methyl bromide.
- Ethylene dichloride.
- Ethylene bromide. ramework, we find:

There are two types of cleaning methods:

A- Mechanical cleaning

This type of cleaning is broken by links between the surfaces of the effect and the dust attached to it without using any cleaning materials or solutions that affect or damage it, and mechanical cleaning is based on several foundations, including:

- The necessity of giving a full and shown on the state of effect as the origin of its components, types and source, as well as its historical element.
- Set all the physical and chemical characteristics of the ancient substance and then diagnose the disgrace.
- Study the environmental conditions surrounding it, and it is intended to be cleaned from the underground water and the salts and types present in the soil surrounding the effect, as well as the water content of the soil and the extent of the difference in the temperature of the night and the day in the seasons of the year (climatic conditions).
- The dust must first be removed using simple manual tools, such as brush, for example, where cleaning is made from top to bottom, then the surface layer is gradually removed after moisturizing it with water or steam in the event that these sediments are in a fragile form, but the methods are used in the event that these sediments are used.

• **Water spray**

The method of cleaning using a water spray is a very specialized process, and leads to a disintegration of singers that may cover the effect, because the microscopic water points relate to the air formed a large specific surface, and this method is used for solid surfaces for a while until it becomes soft and

soluble or removal, but with the use of a limited amount From water to minimum until we avoid migrating water inside the pores. Atomized Water can be used, that is, converting water into a spray to clean the surface where the Atomizer device is used, which converts water into small drops, and therefore simple amounts of water can be used that lead to satisfactory results.

And the idea of cleaning here depends on converting water into a spray consisting of a huge number of drops that sprinkle on the surface of the impact under low pressure without increasing the mechanical effects on the archaeological material and by the fall of this spray on the surface leads to an increase in the surface area and then increased the water connection with the damage layer Foreign Ministry.

This method was recently developed by adding ionic swap resins that lead to water disposal of ions and made it more effective.

- **Sculpture or sculpture**

Metal tools or different brushes are used, including harsh and soft, while steel brushes work to remove the surface layers from dirt, and they can scrape parts of the damaged archaeological material, and for this they should not be used on historical monuments, preferably brushes made of coarse hair, and the

lanes and brushes are used Different depending on the types of deposited impurities and salts in addition to the state of effect.

- **Method of payment of sand**

Using sand is done and there are two wet and dry methods:

- * **Paying with wet sand:** it consists of a mixture of sand and water and must be taken into account the percentage of water for sand, as well as the size of the granules and the size of the air pressure and the distance between the beginning of the exit and the surface of the impact, and this method does not result in soil that is harmful to health and the environment, and it must be followed by rinsing with water The method is used when the plankton is many of the harmful cortex, and it is not recommended to use it in high -valuable ancient buildings, because it can result in migration of salts into the pores of the effect.

- * **Payment of dry sand:** in the same way but dry (without using water), causes the loss of the effect that is cleaned and exposes a new surface to damage, and the stones causing stones the appearance of a new irregular surface, in addition to a change in the decorative and engraved parts.

- * **The air stream method with microcredit:** Microleum grains (alumina or with microscopic glass granules) are used less solid than silicate and smaller in size, and you must make sure of the strength of weak payment and moderate mechanical action, as it is possible to control the cleaning in this way and it

is suitable for precise stone effects Very without damage, and uses the 27/60 micron oxide powder, the most important of which is:

*** The method of ejaculation with stories granules:** It depends on pushing the stories granules to the surface to be cleaned, which leads to removing the accumulated dust from the stone surfaces in particular. This process requires great care and great skill so that no fragile or weak parts are removed from the effect. The effectiveness of this method depends on the speed of the flowing granules and the duration of its collision with the surface, as well as the diameter of the nozzle from which the granules rush to the stories.

*** The method of ejaculation with wet grains:** It is similar to the first method, except that water is used with the air and granules. Sitting granules. The choice of the type, shape and stiffness of the wise substance, as well as the pressure rate, depends completely on the layers of dirt stuck in the effect, as the circular thighs are used to remove the damage layer along with the use of soft sand and the coresmod powder and that with the attached damage, as well Sodium picarbonate, glass beads, or aluminum oxide, as well as silicone powder found in the effect, and there are types used for weak fragile places such as alpine, dolomite and talc powder.

B- Chemical cleaning

After completing the mechanical cleaning, which is superficial, chemical cleaning comes if the condition of the impact allows, and this is using different detergents depending on the type of damage that will be cleaned, and distilled water is used at first, as impure water damages the surface of the impact, and neutral soap can be added with ammonia.

Among the materials used in chemical cleaning: gel solvents, which are weak basal solutions, as well as industrial detergents and there are three types of them, and this according to their properties, negatively charged detergents, and other positives and there is non -ionic (equal). Since the detergents are positive, the charge dissolves the effect and no Power removes, while negative detergents are more effective but interact with limestone especially, while non -ionic detergents are the best, because they are a long series of hydrogen, so they have the ability to extract fats and oils, and the use of acids and acid salts (hydrochloride acid) should be avoided because there is there because there is there Parts of it are implemented to the depth of the stone and interact with its components.

- **Remove salts**

Before starting this process, tests and tests should be performed to know the nature of the salts in the stones, and there are two types of salts: soluble salts, and other insoluble.

Water -soluble salts: Return these salts with constant washing and take into account not to dry out so that it does not lead to crystallization again.

- **Insolent salts:** Use various acids such as hydrochloric acid, citric acid, or oxalic acid in different forms as a topical treatment to remove salts when they appear on the surface in crystalline forms consisting of insoluble salts such as sulfate salts and are considered a very accurate process.

5-2 Strengthening

As a result of the decomposition and fragmentation processes that occur to the effect when exposed to different damage factors, it happens that the stone loses its cohesion and its surface erodes the large depths, cracking, or occurring cracks and cracks, allowing the separation of small fragments or relatively large pieces of the edges of the cracks.

The goal of maintaining stones in archaeological buildings, especially is to avoid the loss of any part of the stone, no matter how small, so the strengthening operations (restoration and cohesion of the material) are considered one of the most important maintenance operations, especially if the archaeological materials lose their cohesion and their survival becomes threatened with the danger of loss, as it works On improving its ability to resist the effective environmental factors, in one sentence is to give the archaeological material more solid and strong, and this to protect and preserve it against

damage factors, and this by using recognized materials and mechanisms, has the ability to return in the event of non - approval of the form, depends on the principles of reflection and harmony, Passing into other operations, including diagnosis and analysis.

The strengthening is done in several ways according to the nature of the building and the circumstances surrounding it, as it is applied in various forms according to scientific jurisprudence, so the teacher or masterpiece understood a basic principle in order to preserve it, as this leads to finding how to stop damage and isolate it from the circumstances that contribute to its gradual disappearance.

A- The procedures that must be taken into account before the strengthening operations: the most important of them:

- The state of impact and its natural porous and permeable properties
- The method of strengthening used

Climate conditions for the presence of the effect

- Remove salts before starting to strengthen
- Use of strengthening solutions with ratios that ensure their penetration to the largest possible distance within the impact, as the acquisition of a superficial shell of natural properties contrary to the natural properties of the rest of the archaeological materials as a result of their

strengthening, will lead to their separation when exposed to high degrees of heat and humidity, and as a result of exposure to the pressure of the imprisoned air inside the pores. The effect when stretching it with heat, for this reason, it is necessary in cases where the porphyry of stones does not help to enforce the strengthening solutions to a great distance within the material using solutions that allow air to penetrate when it is expanded, such as: silicon and acrylic materials (solutions with low concentrations).

- The use of strengthening solutions with appropriate concentrations so that they do not cause a change in the color of the treated impact and in its shine, in addition to the completion of strengthening in stages, and it must start with reduced solutions and after drying out they use more concentrated solutions until the strengthening process is done.

- Carrying out strengthening actions in a moderate atmosphere, as the speed of organic solvents will change the levels of solutions, as it leads to the accumulation of strengthening materials on the surfaces of the effects.

Artificial plastics should be removed from the surfaces of the monuments made of stones, especially before drying out with the use of organic solvents such as acetone.

- Not to excessive use of industrial plastics to strengthen the effects of the sun and limit them to their use on cases that are not harmful to the use of these materials.

B- Restore methods

• Strengthening by selling

Usually the fortified materials are in the form of a liquid, and when the effects are treated with tankers and the latter permeates the surface of the stone and may extend to its depths until it reaches the proper part of the stone, and the aim of the spring is the arrival of the strengthened material to the pulp of the effect and leads to the interconnection and cohesion of all its components. Among the most important methods of sale:

*The technique of the paper cover: The theoretical basis of this technique depends on preserving the surface of the impact as well as the paper cover, moist or constantly wet for hours, and sometimes for several days to avoid the evaporation of the strengthened fluid and this to ensure its excess of the largest depth possible, so that the surface is covered with a sophisticated cover attached to the surface of the impact by Light adhesive, and keep the paper cap after that. And continuously wet wetness of the liquid.

*Injections: This method is applied in the case of the effects that have cracks and gaps, as well as in the walls, the archaeological monuments that crumble part of the

tendency of Taha, and in the absence of these cracks and cracks, it is prepared to strengthen thin holes and preferably in places far from the inscriptions and colors, and remove what is attached to the surface The effect of the substance of the spring.

- **Reinforcement using iron,**

which is a common method in most ancient buildings, as it is used in the case of large cracks that are feared to cause separation of the stone, and is summarized in linking cracks with iron skewers (preferably using steel because it is not stainless) fixed with one of the strong plastics of epoxy mixed with stone powder that is being restored by making holes specifically for this purpose.

The sixth axis: security and safety for museums

The security and safety of the museum groups is one of the priorities and interests of those responsible for museums worldwide due to its historical and scientific values that must be

preserved in order to remain for future generations in the good image currently on them, and the protection of antiques is based on several sections, the most important of which are

1- The techniques used in the security and safety of the museum

It is considered to confront the risks to the body of the building (the museum building) is the first steps to protect to preserve our cultural wealth for future generations.

In order to guarantee the building a comprehensive security system, there must be a periodic plan to make a thorough and comprehensive examination or what is known as regular periodic survey in order to remedy small problems and can be controlled. This periodic survey is considered at the heart of the work of the museum secretaries who must know each small and large inside the museum building, by following the following steps:

1- Monitoring the building's position and following up the buildings that arise around it.

2- Monitor warehouses, warehouses and exhibitions periodically, with the following:

A- Monitor the climate of the display of the display.

B - Monitoring one piece inside the display cupboard.

c - Monitoring air humidity and its sizes It shows us two types of environment that must be taken care of, namely:

- The environment inside the display wheels between the pieces.

- The environment between the display wheels.

- 1- Monitoring the electrical distribution map.

- 2- Sewage map with knowledge of who is responsible for following up these works for reference if necessary.

Emergency map or disasters with knowledge of survival exits.

- 4- The necessity of knowing the natural climate within the city in which the museum is located. One of the basics of knowing those in charge of the museums is to realize the awareness of the climatic situation in the region if it is divided into chapters (rainy - dry - hot - cold).

- 5- Determine in any region the museum is located, i.e. the city's quality, if it is a residential, commercial, industrial or tourist area.

- 6- If the museum is near these areas, this must be placed in the circle of the interest of those in charge of the museum administration, namely: water bodies (lakes and rivers), mountains and forests, airports and crowded roads, or built in areas where they are landed or located in The scope of the volcanic belt and a must pay attention to:

First: The protection of the external ceiling of the building is a series of natural barriers to protect the valuable groups that are inside, such as walls, floors, ceiling, doors, windows, doors and windows.

Second: The security measures are considered in all cultural institutions that contain artifacts and natural and artistic works, including museums, and take the necessary measures of importance in a place, but the system of procedures followed as follows:

- **The size of the facility:** The size is evaluated according to the area of the (museum) site and the number of floors that make up the facility, attached buildings and the distant area that constitute a security range for the region.
- **The shape of the engineering building:** This includes the number of outlets allocated for entry, exit and suitability in relation to safety and insurance procedures and the quality of construction used.
- **Workers:** They must be counted and vocational cards are issued for each of them and to determine their work sites to maintain the contents of the facility, while identifying an outlet for them to enter and exit. With another identification for visitors, inspection of small bags, and preventing large entry, but are placed as trusts while examining suspected cases.
- **Using monitoring warning systems:** to avoid sudden fires by providing the museum building with special equipment to extinguish fires and coordinate with the Civil Protection Department on the one hand, and to use the surveillance cameras on the other hand.

The museum's readiness for use depends entirely on the quality of the museum groups contained in the museum in its two parts (display and storage). The museum contains different types of archaeological artifacts.

- Organic materials.
- Industrial materials.
- Organic compound.
- stone and metal materials.

A mixture of organic and non -organic.

Accordingly, the appropriate natural and environmental conditions for the museum must be available for their safety from physical and chemical damage factors in the long run. Here, the effect of light and humidity, heat and pollution here means the sensitivity of the museum materials and the degree of their influence with the aforementioned damage factors according to several factors, including:

- 1- The museum plot itself in terms of its chemical composition, whether it is organic, vegetarian, animal, inorganic or vehicle of more than one substance.
- 2- The current state of the material, whether damaged, medium, or good.
- 3- The location of the piece inside the museum.
- 4- The geographical location of the museum, as the strength of the spread of light and the degree of relative humidity varies from one place to another.

Whatever the degree of influence of these factors, maintaining the integrity of the assets in the museum is one of the most important duties on officials by providing appropriate environmental conditions. One of the most dangerous factors is the museum groups.

Light damage

Light has many risks to the assets in the museum, whether it is natural or industrial light, and from the dangers that light can cause:

- The dangers caused by ultraviolet rays on organic materials, especially colors, as they change the color and analyze it.
- Infrared works to dry organic materials such as paper and wood, which water is part of its composition, which results in the breaking of the cells of these substances.
- The percentage of water in solid materials increases when sunlight is increased (pottery, etc.).
- Dry materials (glass - minerals) expands with high temperature, and this causes cracking and smash them in the long run.
- The growth of rodents and micro -insects causing rot in hot climates.
- Heat has a close relationship with moisture, as increasing temperature causes a high degree of humidity, which in turn works to damage the museum materials

The techniques used to reduce the effect of light

- Preventing ultraviolet arrival: Natural light is the main source of this type of rays. For example, if an hourly painting is exposed to a display of an ultraviolet museum, it will be affected 6 times if it is affected by artificial lights in the same time period.
- Using light refineries (filter) by installing them on windows or on industrial lighting, and there are two types of refineries:
 - Eclipse plates with a 3-6 mm thick or dark thickness.
 Use a sticky liquid material that is applied to the glass.
- Very sensitive materials can be displayed in halls in which light does not exceed (50 lux) such as paintings drawn in watercolors, oil graphics, textiles colored leather prints, normal museum samples.
- Sensitive substances should be shown in halls in whose light does not exceed (150 lux) such as wood, leather, bones, ivory.
- Low allergic substances that can withstand lighting should be displayed at (300 lux) such as stones, pottery, glass, and minerals.
- Putting metal curtains working with the observer system by regulating the entry of light during the different day periods.
- Dependence on the artificial light of lighting in the museums of favorite lamps is the lighting of the tanjetan and fluorescent, taking into account the lack of disturbing the vision of the visitor by placing the lamps in places that allow a clear vision without the presence of shadow or bright or shiny points.

- Show it for a short period in the showrooms and replace it in the other time from time to time, or not to be illuminated during its display.
- Stop light while storing it.

Relative humidity damage

Its dangers can be summarized on the museum councils as follows:

- Changing the shape and size of the pieces, as it grows with the increase in moisture and shrinks when it decreases and results in the cracking of the parts of the piece and breaks its tissues and the risk of this increases when the pieces are made of thin materials such as manuscript paper and wooden tires for the incinerial paintings.
- Humidity causes chemical reactions to encourage:
 - Motivating different minerals echo.
 - The color of colors and their fading.
 - Activating fungi growth, especially when it exceeds 70 %, as it helps to lack organic matter and destroy them, and the relationship of organic materials with moisture depends on the type of piece and the degree of relative humidity around it.

The techniques used to reduce the effect of moisture

- We must take into account that the temperatures also, the first factor in affecting relative humidity and the temperatures of the

halls for the width (between 12 and 17 degrees Celsius) can be preferably (5-10 ° C) in the stores that contain me Manuscripts and paper documents, for fear of the growth of fungi

- Stabilizing the degree of relative humidity, and providing appropriate moisture according to the nature of each subject offered:

- *The climatic environment between the display wheels

- * The climatic environment between the pieces inside the display wheels. To measure this environment, we need to make sure of important elements that are collectively what we mean by the climatic environment (light - temperature - relative humidity - dust insects) and to monitor this, tools must be available that help in knowing these things from temperature and humidity measuring devices.

Chapter Six: Physical Cultural Heritage

2- The material cultural heritage

2-1 Definition

Heritage is all that the ancestors leave to reach children and grandchildren, and the meaning of heritage in the language is approaching the previous meaning, as it is all that a person leaves his heirs and origins inheritance or inheritance, so I replaced Waw Ta, the heritage, heritage and inheritance.

The term cultural heritage appeared in order to call what we inherited from grandparents and fathers in the form of cultural and civilizational achievements. The material heritage falls under cultural heritage, which means the group of material waste, which has proven its value and authenticity in the face of the forces of change.

The heritage is linked to the term heritage areas, which are places that express the memory of the place and contain the aesthetic and cultural side, and it includes the largest crowd of material waste of civilized or historical value.

2-1 Its importance

Heritage plays an important role in formulating the memory of nations, its civilized depth and the differentiation of its local culture. The importance of material heritage and historical areas lies in the following points:

- The material cultural heritage is an essential part of the features of cities and villages and gives them originality and beauty between cities and other regions and the historical and cultural importance for that.

- It represents the cultural heritage and historical regions with all that contains a planning and architectural school that can be inspired by the distinction of its life embroidery and the efficiency of the exploitation of space in it functionally and aesthetically in addition to the proper use of the use of local materials, and also provides models for harmony between the human and the surrounding environment.
- The functional role offered by the material heritage due to its locations in cities and villages and the possibility of working to adapt large parts of it to provide new jobs that are appropriate to the current era.
- The heritage represents the space in which the ancient time lives, which makes this heritage a high symbolic and spiritual value in addition to the historical archaeological value and the scientific documentary value and sometimes religious value, which is all great importance in many aspects, including political importance.
- The tourism importance of the material cultural heritage stemming from its originality and its scarcity, in addition to the economic and social importance it follows.

2-1 protect it

Several measures must be taken to protect heritage archaeological materials in order to be safe from sabotage and demolition, the first of these measures:

- Conducting an archaeological or heritage survey of the region to be protected to identify the importance of the historical, artistic and archaeological heritage materials and to make preliminary plans for them, document and photograph them.
- Preparing lists of archaeological or heritage materials to be protected to make decisions of the authority that are the authority to issue decisions, and thus archaeological or heritage materials have become under the umbrella of legal protection covered by legal protection, that is, the penalties stipulated in positive laws can be applied.
- **Intensive monitoring:** The studies and legislation that we mentioned may not be sufficient to protect historical evidence. How much of an archaeological construction registered by its owners to establish a modern building in its place is to be able to gain material gain for them or set up a modern facility or made amendments or reforms that offend its originality and historical, architectural and technical value, As if the archaeological building is used badly to harm it, and sometimes the archaeological construction is destroyed and its stones are taken to benefit from it in establishing a government or private building, or its architectural technical elements are stolen to trade and smuggle it abroad, and the matter here needs to be deterred.
- **Awareness:** It summarizes the citizen's definition of the importance of the cultural and economic implications for him

and others and seizing opportunities to raise his interest in civilized heritage and notify him of responsibility.

- The involvement of citizens in taking responsibility for protecting the archaeological and heritage heritage to inform them of responsibility by introducing them and participating in the governmental and private committees and institutions that sponsor this matter and it is necessary to create government or civil institutions to help educate citizens and occupy archaeological and heritage buildings and communicate with actors in this field such as local councils and local government authorities Or the authorities of government, such as the various ministries and the House of Representatives, explain the dimensions of the heritage issue and their benefit to the people and identity, and thus demanding the allocation of the necessary funds to maintain these cultural legacies, rationalize their uses and issue legislation regulating that.

2 -global bodies working and active in heritage preservation

- **UNESCO:** It is an abbreviation of the translation of the United Nations Educational, Scientific and Cultural Organization (UNESCO) on November 16, 1945 AD. The goal set by the organization for itself is a great and ambitious goal: Building peace forts in human minds through education, science, culture and communication, and works to find the appropriate conditions for launching

a dialogue between civilizations, cultures and peoples and working to achieve an integrated vision for development, the efforts of UNESCO international efforts to protect material heritage lead I put many covenants and treaties related to the preservation and protection of material, non - material and natural cultural heritage.

- **IMOS:** An international government organization whose center is in Paris - France, the council was established in the year 1965 AD and its role is to enhance the application of the theory of the theory of architectural and archaeological heritage and its methodologies and scientific techniques, and its activity is based on the principles of the International Charter for the Conservation and Archeology of the sites and restoration of the Venice Charter 1964 M).
- **ICCROM:** It is an abbreviation for the translation of the International Center for the Study of Cultural Property and its Restoration, and it is an international government organization whose center is in Rome- Italy, established by UNESCO in 1956 AD, and its regular tasks are to carry out programs in the field of research, documentation, technical assistance, training and public awareness In order to enhance the preservation of the transferred and transmitted cultural heritage.

- **The World Heritage Center (WHC)** is an abbreviation of: (World Heritage Center), which is a UNESCO committee, where UNESCO member states adopted in 1972 the World Heritage Agreement (basic texts, UNESCO 2006, page 34) and the agreement stipulated the establishment of the 'World Heritage Committee' ' And the 'World Heritage Fund' and the committee and the fund were established since 1976 AD, and the purpose of the agreement is to appoint the cultural and natural heritage of exceptional global value, protect it, preserve, reform and transfer to future generations.

2 some international and national laws and covenants to protect material cultural heritage

International covenants have stressed the preservation of this huge cultural heritage, and this is through maintenance materials:

- **Carte de Venise in 1964**, as most materials are related to maintenance such as materials from 4 to 13 and especially Article 15, which stipulates the reconstruction process that must be excluded excluding the re -installation of the scattered parts.

- **The Lausanne 1990** treaty through Article 07, which stresses an approach in which it was issued for restoration, which recognized the possibilities of rebuilding for experimental research and studying it, as it states that the reconstruction process must be done with great caution and

this to avoid obscuring any sources or meanings to reach perfection for the pieces.

- **The Treaty of Riga**, which took place in Lithuania in 2000, and is the most applied now, which reinstated the decision to prevent reconstruction by preventing reconstruction, except for special circumstances and exceptions for the repetition of construction, which must be predictive (hypothetical), - There are also some Algerian legislation, although they are few, it stipulates the need to protect monuments and monuments, through some articles of Law 04/98, which includes the following:

Malcon can benefit from private cultural properties with maintenance, restoration, rehabilitation, conservation, or survey, direct financial subsidies provided or indirectly provided by the state.

Article 83: Classified or proposed cultural property is arranged, which requires immediate maintenance and protection works in a rush list. The owners of this kingdom can benefit from state subsidies or local groups from support or major works. The owners of real estate real estate in the area of protecting the real estate cultural property concerned can benefit from this subsidy if these properties are the revenge of a contribution to highlighting the value and improvement of the categorical real estate ownership.

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Article 85: The classified or proposed cultural property benefits from classifying the properties of the public or private state or local societies, obtaining various forms of financing for restoration works according to the legislation in force.

Article 87: The National Fund for Cultural Heritage arises in order to finance all operations:

- Maintenance, preservation, protection, restoration, rehabilitation and reclamation of the real estate and transferred cultural property.
- Maintenance, preservation and protection of informal cultural property.

- It is decided to establish this fund and obtain various funding works and direct, or indirect subsidies for all classes of cultural property and stipulates within the framework of the Finance Law.
- It is decided to establish this fund and obtain various funding works and direct, or indirect subsidies for all classes of cultural property and stipulates within the framework of the Finance Law.

Algerian museums suffer from the weakness and failure of administrative management, which did not know a legislative organization until 1985, which is the date of the typical law of museums, where national museums in Algeria subjected to the provisions of Decree No. 85-277 of 29 Safar 1406 AH corresponding to November 12, 1985 'determined The model basic law for national museums 'and this decree formed the actual start of the self-management of national museums to be canceled in 2007, based on the issuance of Decree No. 07-160 of 10 Jumada I 1428 AH corresponding to May 27, 2007' determines the conditions for the construction, tasks and organization of museums

The heritage appeared recently as a basis in strengthening the cultural structure of societies, and this imposed on the international community to find ways to preserve this heritage on the one hand, and highlight it on the other hand, and the museum institution has achieved these demands, as it made the cultural and educational constructive museums of society a priority of its policy.

In view of the miserable political and social conditions that Algeria has known in the colonial period, national museums did not know a legislative organization until 1985 and this is after the restoration of national sovereignty, which is the date of the typical law of museums, on the basis of which the administrative management of the Algerian museums began

Legislative texts for Algerian museums:

The national museums in Algeria, starting from 1985, were subjected to the provisions of Decree No. 85-277 of Safar 29, 1406 AH corresponding to November 12, 1985 'The statute of the model basic law for national museums, which was issued to alleviate the pressure on the central administration, where the National Museum institutions granted self-management, This is through the first article of this decree, in which it says, "National Museums whose statute of idealism in this decree is considered public institutions of an administrative nature, and enjoy moral personality and financial independence."

This decree was the actual start of the self-management of national museums to be canceled in 2007, based on the issuance of Decree No. 07-160 of 10 Jumada I 1428 AH corresponding to May 27, 2007 'determines the conditions for the construction, tasks, organization and progress of museums.

To cancel this decree as well, just four years after its issuance, after the issuance of the new decree No. 11-352 of 07 Dhu al-Qi'dah 1432 corresponding to October 05, 2011 'The statute of museums and interpretation centers of the museum are still standing.

Museum decrees issued from 1985 to 2011:

Museum decrees in Algeria began in a modest and simple manner, and did not exceed eighteen articles, and this number doubled with the last decree, but in general they addressed the same points and were only concerned with expanding them, which were represented in:

First: Definition of museums: Algerian legislation defines the museum as follows:

Decree 85-277 "The national museums whose model basic law is defined in this decree are public institutions of an administrative nature, endowed with legal personality and financial independence, and placed under the supervision of the Minister in charge of Culture" according to Article

Decree 07-160 'Museums of public institutions of an administrative nature that enjoy the moral personality and financial independence, and they are called at the heart of the text' museums' according to Article Two.

A museum in the concept of this decree is every permanent institution that has cultural and/or scientific groups that are formed from property, which is preserved and displayed in general importance, and is organized for the purpose of knowledge, education, culture and enjoyment.

Decree 11-352 "In this decree, a museum is considered every permanent institution that contains collections and/or artifacts that constitute collections, the preservation and display of which is of public importance, and which is organized and displayed for the purpose of knowledge, education, culture, and entertainment.

In terms of concept, we find that the Algerian legislator placed all national museums under the guardianship of the Minister in charge of Culture, through Article 1 of Decree 85-277, and this contravenes the provisions of Article 5 of Decree 07-160 and Article 7 of Decree 11-352, which stipulated the possibility Establishing national museums that are affiliated with a ministerial department other than the Ministry of Culture, based on a joint report between the Minister in charge of Culture and the relevant minister. The

recent decree also added the opinion of the Museums Committee.

Second: Tasks: The three decrees specified the museum's tasks, which were among the most important points addressed by these legislations:

Protection and preservation: This is a very important process for heritage, which cannot continue without it, and it is the most important process of the museum's functions, and therefore the three decrees addressed this process. In the museum's tasks.

Inventory: It is a process in which the last two decrees participated, but it was not included in Decree 85-277.

Display: The primary goal of establishing museums is the process of displaying collections to the public, which no museum can neglect, and in fact the Algerian legislator touched on The three decrees for this process.

Media (communication): It was included in all decrees, but the last decree 11-352 addressed it in detail, as it required the establishment of media and communication spaces, pedagogical workshops, and meeting spaces. Organizing national and international conferences and did not address the issue of training or training, despite their great importance.

Activation: (lectures, exhibitions, and dissemination of information). The Algerian legislator did not neglect these programs in his three decrees.

Relationship with institutions: relations of exchange and cooperation with similar institutions as well. It has all the decrees on it.

Through the study of the three decrees, it appears that the Algerian legislator preserved the same text, and the essence of the difference lies in what was contained in Article Three of Decree 85-277, and the legislator neglected him in the following decrees, while he should have supported this process, expands it, and organizes it with subsequent texts, The process is the task of participating in 'archaeological excavation'.

Third: Types of Museums: The legislation differed in determining the items of museums, where we find the first decree, which is a decree 85-277, limited to national museums, to be done in the following decree, which is Decree No. 07-160, adding another category, which is the regional museums, and this decree knows them as follows:

National Museums: The museum is classified into a national museum, given the value of historical, artistic, cultural and scientific groups.

- Regional museums: The regional museum is a museum that includes groups related to history, arts, traditions and traditional professions whose source is from the same region. According

to Article eleventh, the internal organization of the National Museum, its attachments and the regional museum is determined by a joint decision between the minister in charge of culture and the Minister of Finance and the authority in charge of the job General.

Museums are established by executive decree based on a proposal from the Minister in charge of Culture. The establishment decree specifies the types of collections to be preserved, as well as the headquarters and guardianship.

In addition to these two types, the legislator added in Article 6 of this decree, which states: “Regardless of Articles 3 and 7, 8.9 of this decree and in accordance with the book of conditions determined by the Minister in charge of culture by decision enabling natural or legal persons subject to private law to establish museums called “monitoring museums”. These museums are subject, in accordance with Article Seven, to technical and scientific supervision in the interests of the Ministry in charge of culture.

The Algerian legislator expanded these types in the recent Decree No. 11-352, which related to three types in addition to a new institution that is proposed for the first time in museum legislation:

The National Public Museum: As stated in Article Seven, the National Public Museum is a public institution of an administrative nature, enjoying legal personality and financial independence. It is established by executive decree based on the proposal of the Minister in charge of Culture. The decree specifies the establishment of the annexes of the public museum by a joint decision between the Minister Regent and the Minister in charge of Finance.

The internal organization of the National Public Museum and its annexes shall be determined by a joint decision between the concerned minister, the Minister of Finance, and the authority in charge of public service.

The public museum affiliated with local communities: According to Article Twenty-Four, the establishment of public museums affiliated with local communities requires a certificate of conformity delivered by the Minister in charge of culture after taking the opinion of the Museums Committee. According to the following article, the organization and functioning of the public museum affiliated with local communities is subject to the provisions of Decree 83-200/19 March 1983. In terms of construction conditions, they were identical between the national public museum and the public museum affiliated with local communities, which were represented in:

- The presence of antiquities that constitute collections and/or collections.

- Compliance with the standards of professional work in the museum field.
- Matching the spaces of display and memorization of the required museum standards.

Private Museum: A private museum is a permanent, non-profit institution established by legal persons subject to private law, and its subject is social and cultural benefit. The establishment of private museums requires a certificate of conformity delivered by the Minister in charge of Culture, after taking the opinion of the Museums Committee. Conformity must be renewed every five years. The establishment of a private museum must meet the following conditions:

- The existence of a museum project.
- The presence of museum and/or media collections and props.
- The standards of professional work in the museum field are met.
- The display or preservation spaces conform to the required standards.

In addition to the previous items, Decree 11-352 added new institutions to the Algerian institutional system, as mentioned above, and this is in Chapter Five related to the museum-museum interpretation centers.

Interpretation centers of a museum nature: In the last decree, the Algerian legislator created a new institution called the Interpretation Center of a Museum Nature. According to Article Twenty-Eight, it is a public institution of an administrative nature, enjoying a legal personality and financial independence. The Interpretation Center is established by an executive decree based on a proposal from the Minister. In charge of culture, after taking the Museums Committee, the decree determines the subject and subjects of the restoration and/or the center's headquarters, organization, operation and guardianship.

The Center is an institution directed to provide the reading, interpretation, and restoration of historical events, techniques, and certain scenes to the public through museum and/or media supports, in accordance with Article 6. To establish an interpretation center with a museum nature, it is required to have a project centered around a topic or topics for interpretation and/or restoration, and the Center is assigned tasks. The following is in accordance with Article Three:

- Raising awareness regarding the issues of cultural and/or natural heritage through all media and scenographic means.
- Educational and pedagogical departments making it necessary to understand the topics of interpretation within the reach of the public.

□ Developing proposed pedagogical workshops for the youth audience aimed at correcting their outlook and teaching them cultural and/or natural heritage.

Introducing the designation of the Museum of Algiers:

Decree No. 11-352 was the first to establish the “naming of the Museum of Algiers” for national public museums, those belonging to local groups, and private museums. The designation of the Museum of Algiers is established in recognition of the value of the collections, their originality, and the extent to which they are compatible with the tasks of public service and benefit. This designation is granted based on At the request of the museums and the above-mentioned utility pursuant to a decision of the Minister in charge of Culture, after taking the Museum Committee and obtaining the “designation”, indicators of effectiveness and efficiency must be responded to, especially in the field of preservation policy, its quality, public reception, and dynamism in the management of the museum, and the criteria and methods for granting... The designation and its withdrawal shall be made by decision of the Minister in charge of Culture after taking the opinion of the Museums Committee in accordance with Article Five.

Fourth: The administrative hierarchical structure of Algerian museums:

Museum legislation focused on the administrative structuring aspect of Algerian museums, as it highlighted the bodies in charge of this aspect, and divided this structuring into two aspects, administration and management, where we find in terms of management the correspondence between the last two decrees No. 07-160 and Decree No. 11 - 352, where the administration was entrusted to the Guidance Council. As for the first Decree No. 85-277, the administration was entrusted to the director and the Guidance Council supervises him. Article Four.

The Steering Council: The Steering Council represents the Supreme Authority for Museums. The Steering Council differed in terms of members in the legislative decrees, and we will start with the first decree, where we find a representative of the Minister of Culture as president, a representative of the Minister of Interior and Local Communities, a representative of the Minister of Finance, and a representative of the party, and the latter was not included in the last two decrees.

As for the decree 07-160, we find the minister in charge of culture as a president, who is charged with interior and local and financial groups, with the Mujahideen in religious affairs and endowments, youth and sports, in scientific research, in national education, in tourism, and this is with regard to national

museums, while regional museums we find almost the same members except representatives in scientific and interior research and local groups.

Regarding the last decree, we find that the list has been reduced, depending on the circumstance and situation: the representative of the national authority as president, in culture, in finance, two persons concerned by the guardian authority by virtue of its competence, representatives of the other concerned departments, the list of which is determined according to the establishment decree, and in the three decrees the council can seek the assistance of any person who would assist him in his work, and the director's attendance at council meetings is limited to an advisory voice over the other decrees.

The essence of the difference lies in the fact that Decree No. 07-160 was the right to head the council from the share of the representative of the Minister of Culture, and in the last decree 11-352, the presidency is the right of the representative of the will, as for the tasks, it came in general similar where we find:

The project's internal system and organization project.

Acceptance of gifts and wills.

Appreciation statements revenue and expenses.

Budget projects.

Annual and multi -heritage activities programs as well as the outcome of the activities of the past year.

Annual accounts.

These are tasks in which the three decrees shared. As for the difference, Decree 85-277 and Decree 07-160 touched on the general programs for concluding agreements, deals, and transactions that museums are committed to. The second point, which was limited to the second decree, was the appointment of employees for the National Museum, which it overlooked. Decree No. 85-277 and Decree No. 11-352. For reference, the tasks between the national and regional museums in the second decree were identical.

Decree No. 07-160 and Decree No. 11-352 differed in terms of the term of appointment, which was initially three years and became five years. The nominal list is determined in this decree by a decision of the guardian authority and in the previous decree by a decision of the Minister of Culture.

As for the meetings, they are similar in terms of All decrees are required to be held at least twice a year. They can also meet in extraordinary sessions. Summons are sent attached to the agenda at least 15 days before the date of the meeting. The duration in extraordinary sessions can be shortened to no less than 8 days. This is in contrast to the decree. The first one did not specify the duration.

Deliberations are not valid except in the presence of the required number, which was stated in the first decree, half, and in the two subsequent decrees, two-thirds of the members, in the event that the quorum is not reached after another meeting within 8 days, and the first decree 15 days. In this case, deliberations are valid regardless of the number of members, and the Council's decisions are taken by a majority of votes. In the event of equal votes, the president's vote shall prevail, and the Council's deliberations shall be recorded in minutes recorded in a special numbered register and marked by the president. The minutes of the meetings shall be sent to the guardian authority for approval within eight days following the meeting for approval. Decree 85-277 did not address this last point.

Director: We will gather in this element all the directors, even though the director in the first decree was for the administration, and in terms of appointment, we find Decree No. 85-277 based on the proposal of the guardian minister from among the governors who have five years of seniority in their positions, and Decree No. 07-160 based on the proposal of The Minister in charge of Culture, as for Decree No. 11-352, based on the proposal of the guardian authority.

As for the tasks, they were identical between the national and regional museums in Decree No. 07-160 and also identical with Decree No. 11-352. As for the duties of the director in Decree

No. 85-277, they were identical to the previous one, except that this decree added:

- He is in charge of writing the council. Guidance.
- It implements the results of the council's deliberations after the approval of the guardian authority.

This decree also does not address the task of:

- Preparing the annual report on activities and sending it to the guardian authority after it is approved by the council.

Scientific Committee: Decree No. 85-277 did not address the Scientific Committee, while it was included in Decrees No. 07-160 and No. 11-352, and it is concerned only with the management of national museums.

The Scientific Committee is headed by the director of the museum, and the provisions of the two decrees are similar in terms of tasks in: expressing opinions and recommendations in Work plans and programs for the museum's scientific and technical activities. As for Decree No. 07-160, we find that Article Twenty-One was expanded and more detailed, as we find:

- Expressing opinions and recommendations on:
- Programs for exchanges and cooperation.

Technical Committee for Museums: This committee was created in Decree No. 11-352, whereby the Minister in charge of Culture establishes a technical committee called the "Museum Committee" tasked with:

- Expressing its opinion for the establishment of museums and museum interpretation centres.
- Expressing a prior technical opinion for granting the designation “Museum of Algeria.”
- Expressing every technical opinion on museum issues or related to museum collections, upon a request from the Minister in charge of culture, specifying the necessary criteria for formulating opinions, methods of studying files, and rules related to the composition of files that allow the Museums Committee to verify the existence of a museum project in accordance with a system taken by decision of the Minister in charge of culture. After consulting the Museums Committee. The Museums Committee consists of six to nine members, including the Chairman. They are appointed by decision of the Minister in charge of Culture and are chosen for their competence, and for the attention they give to cultural heritage, the Museums Committee can seek the assistance of any person who would assist it in its work by virtue of his competence, and this is in accordance with Article Thirty-Two.

Fifth: Entry rights to museums: Regarding entry rights, the first decree related to this institution did not address this point at all, but the last two decrees No. 07-160 and No. 11-352 indicated that entry rights are determined by a joint decision between the Minister of Culture and Finance.

Sixth: Museum Architecture: Both Decree No. 85-277 and Decree No. 11-352 overlooked this point despite its extreme importance, and its reflection on the returns of museums, and their relationship to the preservation and protection of collections, and the management of museum work in general, which we find in Article 8 of Decree No. 07- 160, in which it was stated that the establishment of each museum depends on the presence of a cultural heritage conservator or cultural heritage preservation attaché, and the conformity of the buildings to museum standards, specifically mentioning:

- Display space
- Stores.
- Laboratories.
- Library.
- Workshop.
- Enjoyment space.

Seventh: Financial provisions: With regard to financial provisions, we find that they are almost similar except for some points that we will mention, as the National Museum's accounting is maintained in accordance with the rules of public accounting, and the keeping of accounts and the circulation of funds are entrusted to an accountant appointed or approved by the Minister of Finance, and we find in these provisions:

□ Expenses: which are represented in management expenses, equipment expenses, and all expenses related to their subject, and these are the points in which the decrees are similar. We find this in Article Fourteen of 85-277, Article Thirty-six of Decree 07-160, and Article Twenty-one of Decree 11-352.

As for the points of difference, they were found in Article Twelve of Decree 85-277, as this decree subjected the National Museum to the state's financial control.

□ Revenues: They were also similar, as we find:

- State subsidies, local groups, and public bodies.
- Donations and bequests.
- Private revenues associated with its activity.

As for the essence of the difference, it was what was presented in Article Thirteen of Decree 85-277, which is the right of the museum institution to benefit from loans as a fourth form of the institution's revenues. Therefore, this decree allowed for benefiting from loans, which was not addressed in the two subsequent decrees. He also added that the museum provides the budget as a chapter. Chapter, article by article, and it is presented to the guardian authority for approval and to the Minister of Finance after approval by the Guidance Council, and this is in accordance with Article Fifteen. The administrative accounts and management accounts are submitted to the Guidance Council, for approval, and then sent to the guardian minister, the Minister of Finance, and the Accounting Council,

according to the conditions specified in the current regulation. It works.

The museum director submits the administrative accounts and management accounts prepared successively by the disbursement order and the assistant accountant to the guidance council, to be approved before the end of the first three-year quarter following the end of the fiscal year, to which they relate, accompanied by a report containing all the details and explanations of the administrative and financial management of the museum, as stated. In Articles Sixteen and Seventeen of Decree No. 85-277.

Seventh: Final Provisions: Decree No. 85-277 did not include final provisions, while it included the last two decrees, which stated:

Decree No. 07-160 requires that national museums established before the issuance of the decree comply with the provisions of this decree, within a maximum period of one year, and that Starting from the date of its publication in the Official Gazette, all provisions violating this decree shall be repealed, especially the provisions of Decree No. 85-277 in accordance with Article Forty.

Decree No. 11-352 according to Article thirty-sixth is the museums affiliated with the Ministry of Culture that were created by the organization before the publication of this decree is identical to the provisions of this decree, and in this capacity is considered national public museums as stipulated in Article Seven, which is excluded from the provisions of this decree affiliated museum institutions For the Ministry of National Defense, it cancels the provisions of Decree 07-160 according to Article 38.

In light of what was previously presented, we conclude:

Decree No. 85-277 came simple that did not exceed eighteen articles distributed between the name, the target and the headquarters, the financial organization the resources and expenses of the museum monitoring and organization, and as it appears, this decree came to reduce pressure on the central administration, and accordingly eight national museums were created during the extended time period From 1995-1993.

- ☐ National Antiquities Museum 1985.
- ☐ The National Museum of the Paradise 1985.
- ☐ National Museum of Fine Arts 1985.
- ☐ National Museum Zabana 1986.
- ☐ National Museum Centa 1986.
- ☐ National Museum of Arts and Folk Traditions 1987.
- ☐ National Museum Setif 1992.
- ☐ National Museum Nasruddin Dini 1993.

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Decree No. 07-160 This decree came 22 years after the issuance of the previous decree, which is a very long period during which several museums were established as mentioned above, which required a new legislative text, supporting and does protection mechanisms and preserving museum groups, due to the palaces of Decree No. 85-277 on Providing it, which prompted the relevant authorities to issue Decree No. 07-160 despite maintaining the same text and expanding its aspects only through:

- The creation of regional and reader museums for this legislative text finds that the provisions of the door designated for the National Museum are the same provisions of the door of the regional museum, so the separation between them was formally or verbally.
- The change in management and management, where in the decree 85-277 was managed by the museum, the director of the direction of the Guidance Council, and in this decree the council became the process of managing, and the management is by the director, in addition to the scientific committee that was developed in this decree, and the support of this council with

new members As well as determining the duration of their service.

- Preserving the financial provisions' revenues and expenses we find themselves, and this is unacceptable on the basis that the development in 20 years is a very large development at the level of various fields of conservation of museums, such as display, storage, restoration and maintenance in terms of modern methods and procedures in the field of group preservation, and even In terms of means, and the devices that have evolved in an unprecedented way, even at the level of the institution, its equipment and its continuous activities, and the demands more and more by virtue of the development of society, and this requires creating new sources of financing and not the opposite, but on the contrary, the legislator has canceled the right of museums to take loans, in This decree, which was permitted in the decree 85-277, knowing that the revenues of this institution are very limited incomes that cover only a small part of its needs.

- However, what is calculated for this decree is what the provisions of Article Eight of Chapter, which requires the buildings of the museum standards, the space of display, storage, laboratory, workshop, and enjoyment space.

Decree 11-352 The issuance of this decree did not require a period of twenty-two years, as before, but only four years, and this reflects the interest of the concerned authorities in this

aspect, and the need for the latter to support, and remedy the deficiencies in previous legislation, although the legislator preserved the same text as well , With the creation of new effective elements in this field, especially from the institutional side.

- Development of the naming of the Algeria Museum in Article Five.

- Change the designation of national museums in the previous decree to national public museums, and regional museums to public museums local groups.

- Developing the private museum, which was supposed to be compensated by creating specialized museums.

- Developing the center of interpretation of the museum.

- Development of the Technical Committee of Museums.

- Compensating the minister in charge of culture with the will.

- The legislator preserved this decree on the way museums work, and it did not develop in it, as he preserved the provisions of Decree 07-160 in terms of management and management, and no new new provisions of the Guidance Council, the director, and the scientific committee have not been brought down, but rather the provisions of this decree, as It is in **Decree 11-352**, and this matter is also repeated regarding the financial provisions that came as the same.

Definition of museum holdings:

The holdings in the museum are the most important thing in it and the museum acquires it from archaeological excavations, possession, transfer of ownership, gift or deposit, and can be eaten in different terms, including museum materials, samples, facts, all these terms share that they have been collected for their scientific value, and these pieces The distinctive is always the formation of most of the museum's holdings, and the museum groups share a number of important points, which are made of materials or different materials, and that most of them have reached us from the past and that they were collected with a degree of intent and intention by their owners and that they are It has an aesthetic, artistic and important significance, and therefore the museum holdings are the transmitted cultural property that the Algerian legislator number in the text of Article 50 of Law 98/04 of Safar 2019 corresponding to June 15, 1998 related to the protection of cultural heritage, as:

- The product of discoveries and archaeological research on land and underwater.
- Antique things: such as tools and ceramic artifacts, writings, currencies and seals, jewelry, traditional clothing, weapons and burial residue.
- The elements resulting from the fragmentation of historical monuments.

- Cultural property related to religion, the history of science and technologies, and the history of social, economic and political development.

Entrophic and ethnological equipment.

- Properties of technical importance.

2 _ Groups Classification:

The museums are keen to classify (arrangement of museum groups) according to their type (such as: pottery, stones, wood ...) each of which is allocated a ward or a treasury, and museum groups can be classified depending on their source and place of discovery.

3_ Documentation:

It is the recording of information about the museum's holdings, which is the method used in the index of museums to write the important properties of the museum's contents, and includes a description of the materials, their sources and uses.

4 _ Register:

4 _ 1 _ Definition:

The record is the primary book that must be available in the museum and its existence is very necessary in large and small museums, and it is the tool that protects holdings and provides the administrative official with information about the materials or deposited or transferred ownership, which is the effective means of overcoming confusion and chaos that may It is

produced from the huge increase in museum materials, and the good record is the one that regulates registration in it according to the sequence of days, and when an error, fraud or difference in matters related to possession provides the record the evidence required to take the necessary measures as it helps researchers to acquire the impact of what they want to study, Two copies of the record must be available in two different places for fear of the loss of one of them, and in the event of a registration department, it is necessary to have in each scientific section one copy of the record.

4 _ 2 _ Types:

There are three types of records:

A _ Register in the booklet of the folder: a set of descriptions are available:

It is preferable that its leaves be good, its binding is strong, its writing is clear, the ink that is used in its writing is fixed that does not change the color of time, its successive lines are not empty between them, he writes the date of starting registration and the number of record pages on the first page, you write the numbers clearly and not to be removed The survey, the survey and the permitted addition must be with the consent of the manager and the adjustments are with ink from another color and are signed by the manager.

One of its disadvantages is that it requires some time in registration because the registered materials must be written by

hand, and it is not consistent with the difference in the book line, as well as the difficulty of making the amendments.

B _ regulatory registry in separate (moving) papers: it is a separate papers in which all information is recorded. One of its good deeds is the ease of compensation for the missing paper in another version, the recordings can be written in the typewriter, so it guarantees the writing unit, and print several copies at the same time for another record and For distribution to the scientific departments, and from its disadvantages it is easy to defraud and cheat by placing and replacing a material leaf with another material.

C _ Regular record in cards: It is composed of cards reservations in lights, but it increases in this type of record of fraud risk by stealing a card and putting another place, and this can be avoided by hiding the card and installing it in the firmness by a metal wire and preserving it in a closed wardrobe, allowing This type is recorded.

4 _ 3 _ Information that must be provided in the record:

There is useful general information that I write in the record of many aspects, the most important of which are:

1. Article number.
2. Type of possession (buy, exchange ...).
3. The purchase value.
4. The name and title of the seller or the donor.
5. History of possession.

6. Description (brief summary).

7. Sizes (length, width, height, weight).

8. The origin (the origin of the article according to the geographical region or the civilized role).

9. Time: the date seized in the years or centuries, and if there is doubt about the date of time, you write a question mark to the side of the number.

10. Previous registration numbers, if any.

5 _ The inventory process (numbering):

Before registering the piece, a number must be devoted to it from the loss and distinguish it easily, and the best way for that is the one that is called the trilogy and it is as follows:

The first unit: It consists of the last two numbers or when necessary from the last three numbers of the year in which the plot of the museum enters.

- **The second unit:** is the cutting set number in the current year.
- **The third unit:** consists of the piece number in the group.

There is a fourth element that can be used when the piece consists of four parts. Thus, for example, the number: 46/26/12/2 applies to a part of a candlestick, which is piece 12 of group 26, which was registered in 1946.

The number must be written in A place that is not visible and does not attract attention, and it must be in a clear handwriting and in a material that is not susceptible to loss. The number is

written, for example, in Chinese ink, and painted with an insulating wax material so that it is not lost over time, to ensure that the antiques are not mixed with each other on the one hand, and that the numbers are not lost. Record it on the other hand.

6 _ Masterpiece File:

The masterpiece file consists of several cards, and the process of preparing special cards accompanying antiques and holdings during its transfers is considered a very important process in the so -called administrative maintenance, as these cards allow for stripping and storing information and data about antiques that may be of benefit in the future, as they are It is a notebook through which the path and life of the antiques are recovered.

At the front of the file, we find elements, including:

- The name of the future institution (museum).
- Country.
- Place of masterpiece.
- The name of the royal establishment.
- The inventory number.
- How to acquire or enter.
- The date of acquisition or entry.
- Place of memorization.

The first card: description of the masterpiece.

This masterpiece or this group is prescribed in terms of physical properties.

- Photo.

Class masterpiece according to the shape or function.

Class masterpiece according to the technique of manufacture.

Masterpiece name.

- Naming.
- The name in another language.
- The materials used in manufacture.

Technologies.

- Description.
- Drawing or image.
- writing .
- The state of memorization.

The second card: the date of the masterpiece:

1 _ Industry:

- The manufacturer.
- Place of manufacture.
- The Sick Complex.

Industry time.

- The date of manufacture.

2 _ Use:

- Job.

Use.

- User.
- Place of manufacture.

- Using complex.
- Date of use.

The third card: plural:

1 _ Discover conditions:

- Place of the plural (dug).
- The geographical coordinates of the site.

Masterpiece coordinates on the site.

- Site name.
- The nature of the site.
- the date .

2 _ context (archaeological deposits surrounding the masterpiece).

- The mosque.
- The mission of plural or excavation.
- The date of the plural or the excavation.
- Method of plural or drilling.
- Site number for the masterpiece.

بطاقة التنقل Fiche de mouvement

Nom de la pièce اسم التحفة

Pays البلد

N°d'inventaire رقم الجرد

Musée المتحف

La matière المادة

Dimension الأبعاد

Responsable du transfert مسؤول التحويل

Largeur الطول

Langueur العرض

Epaisseur السمك

Autres أخرى

Définition: تعريف

Etat de conservation: حالة الحفظ

Motif du déplacement: سبب التحويل

La destination: الإتجاه

Date de sortie : تاريخ الخروج

Date de rentrée: تاريخ الدخول

بطاقة الحفظ Fiche de conservation

Service	مصلحة
Collection	المجموعة
Fiche N°	بطاقة رقم
Date de la mise en fiche	تاريخ
الجرد	
La colisation	تحديد الموقع
Nom de l'objet	إسم التحفة
Numéro d'inventaire	رقم الجرد

M
M

Verre(زجاج)	Cuir(جلد)	Peinture(رسومات)	Bois(خشب)
Céramique(فخار)	Tissu(قماش)	Pierre(حجر)	Autre(أخر)

Etat de l'objet: حالة التحفة

Déscription de l'état de l'objet : وصف حالة التحفة

Conditionnement et contrôle : طرق التخزين

Recommandation: إقتراحات

بطاقة الصيانة و الترميم N° Fiche de conservation et de restauration

Identité de l'objet :

تعريف التحفة

Numéro d'inventaire :

رقم الجرد

Matière de l'objet :

مادة التحفة

Localisation: مكان التحفة

Date d'entrée : تاريخ الدخول

Date de sortie: تاريخ الخروج

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Museum offer:

The offer is one of the most important basic functions that the museum cannot dispense with, as it is the mirror from which the visitor overlooks the civilizational evidence it contains, and the offer for museum science is to see the thing for a specific goal that it seeks to achieve, and it must be subject to a number of foundations that depend on Good taste and a high artistic spirit, and the museum is taken into account to preserve archaeological artifacts and protect them from damage and loss, and the museum show aims to two basic goals:

A _ Show the exhibits in a direct way to facilitate the eye and deliver the viewer and the visitor.

B _ The maximum benefit from these exhibits as a means of transferring knowledge and culture.

Storage:

is that place or space in which a large possible amount of pieces are collected. One of the conditions for good storage is that it allows us to access the piece easily with a quick determination of its location without bad dealings that may lead to its damage or breakage, while giving all guarantees for preservation by Choosing methods of protection against change factors (climate, dust, infection

with microorganisms, as well as natural factors such as fire and floods).

Museum holders management

1- Definition:

The holdings in the museum are the most important thing in it and the museum acquires it from archaeological excavations, possession, transfer of ownership, gift or deposit, and can be eaten in different terms, including museum materials, samples, facts, all these terms share that they have been collected for their scientific value, and these pieces The distinctive is always the formation of most of the museum's holdings, and the museum groups share a number of important points, which are made of materials or different materials, and that most of them have reached us from the past and that they were collected with a degree of intent and intention by their owners and that they are It has an aesthetic, artistic and important significance, and therefore the museum holdings are the transmitted cultural property that the Algerian legislator number in the text of Article 50 of Law 98/04 of Safar 2019 corresponding to June 15, 1998 related to the protection of cultural heritage, as:

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It should also be stored permanently in a fortified room against fire and theft, and any records that are used during daily work should be returned to their original place.

4 _ 2 _ Types:

There are three types of records:

A _ Register in the booklet of the folder: a set of descriptions are available:

It is preferable that its leaves be good, its binding is strong, its writing is clear, the ink that is used in its writing is fixed that does not change the color of time, its successive lines are not empty between them, he writes the date of starting registration and the number of record pages on the first page, you write the numbers clearly and not to be removed. The survey, the survey and the permitted addition must be with the consent of the manager and the adjustments are with ink from another color and are signed by the manager.

One of its disadvantages is that it requires some time in registration because the registered materials must be written by hand, and it is not consistent with the difference in the book line, as well as the difficulty of making the amendments.

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7. Sizes (length, width, height, weight).
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There is a fourth element that can be used when the piece consists of four parts, and therefore, for example, the **number:** 46 / 26/12/2 applies to a part of the candlestick consisting of the 12th piece of Group 26 that was registered in 1946.

And the number must be written in an unparalleled place and not striking, and that it is in a clear line and with a substance that is not lost, so the number is written, for example, with the Chinese ink, and it is painted with a waxing substance that is not lost with time, in order to ensure that the antiques are not mixed with each other On

the one hand, and not lost numbers recorded on the other hand.mark to the side of the number.

10. Previous registry numbers, if any.

6 _ Masterpiece File:

The masterpiece file consists of several cards, and the process of preparing special cards accompanying antiques and holdings during its transfers is considered a very important process in the so -called administrative maintenance, as these cards allow for stripping and storing information and data about antiques that may be of benefit in the future, as they are It is a notebook through which the path and life of the antiques are recovered.

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- The name of the future institution (museum).
- Country.
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- The date of acquisition or entry.
- Place of memorization.

The seventh axis: the techniques of examining the effects of antiquities

There are several ways to examine antiquities in general that can be summarized in the following:

1- Examination with the naked eye, and codify all notes for the apparent damage.

2- The next step is to examine the impact under three different conditions of lighting until it adopts us from the lighting of the surfaces, and as a result of delusion, many details of the surface shell under the normal scout used in photography, and in the following situations:

A- The scout by placing a regular surface of the effect.

B- The scout in a deviant position at an angle of 45 degrees, and from one side for the plate or impact.

C- The scout in a position that touches the surface of the impact almost, and this is the light rays collide with the surface in a very deviant angle and also meets with the high brush strokes, as well as the texture of the artwork, and its features are high¹

¹ - تستخدم هذه الطريقة أيضا في دراسة وفحص النصوص الكتابية والرسومات البارزة غير الواضحة.

1- Recording with photographs

The effect of the effect is constantly recorded before starting its restoration to determine the amount of damage by the photography machines, and some may think that one picture of the effect can be taken and then enlarged parts of the nitrif until we get more details, but that is not true, and the enlargement must be done directly during the filming Until we get satisfactory results, as well as if we want to enlarge some accurate effects of their original sizes for double sizes, for example, when enlargement to ten times the original size, additional special lenses are placed for zooming over the lens of the camera, and if the zoom is more than ten times the use of the special microscope for that , This microscope is used for larger and more details.

Several sizes (cadres) are taken when filming, and there is no doubt that the skilled photographer can get more and more accurate details than the abstract eye, by choosing the type of movie and filters (filters), as well as lighting and appropriate lenses.

The photography examination includes most parts of the painting, statue, or utensils from the front and back, and not only in terms of drawing. The installation of the plate and the rafters in the back and the internal frame and the nails are also important, as the resulting damage in it may threaten the effect of destruction.

Among the difficult cases when examining, those parts covered with the gathering of sediments and dirt, which must be removed with a handkerchief of smooth fabric, and pictures of these places are taken

to determine the shape under it and in the event that nothing appears, an infrared image is taken until the parts hidden appear in the image.

2- Photography of Antiquities

I am not here to explain the history of photography or its comprehensive academic aspects, and I am satisfied with a brief explanation of the photography of the effects and artworks to benefit from it in the scientific aspect, examination and registration while working in the restoration of one of the artifacts.

I would like to refer to the importance of photography and its study for all workers in the restoration field, for a way that can control complete control of the operations and record them first -hand, and know the state of effect before the restoration and record it until it is compared to the final result of the work, as well as the benefit of it in the structures and the return of some inscriptions and parts The restoration of the impact was a necessity to preserve it, because the photography of the restoration and registration process for those who are the most necessary necessities that must be done immediately and during the steps of restoration, so we have the full (diagnosis). As a result of some emergency conditions, we can refer to the records and pictures to infer them.

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And when depicting the impact, it is necessary to observe factors that may result in a non -artistic image, but it is definitely a scientific image, meaning that it can be relied upon in the scientific aspects, and therefore the cracks and fractures must be clearly shown, so everything that matters to us is not obtaining a beautiful image of the effect, but obtaining an accurate image For his condition and damage and infection.

Let us take an example of that, photographing a 70 x 100 colored oil plate with cracks and missing parts of the drawing, and it has stuck layers of strange materials that block some parts, and it is necessary to take a photo of them:

- 1- The image is fixed in a horizontal position perpendicular to the axis of the lens of the photography machine completely.
- 2- The position of the lens in the center of the plate is fully accurately determined and accurately, because in the event of an imbalance of the position of the lens or the plate of the plate, it results from that- in the image taken- an imbalance in the lineage, shapes and sizes.
- 3- The photography machine is placed above the pregnant woman so that its position is also horizontal and parallel with the plate, and is perpendicular to the lens.
- 4- Strong lighting headlines are prepared in the case of internal photography in dark places, and this is sufficient for two scouts, each of them is 500 watt, so the result of the lighting up is 1000 watts, and these two scouts are placed on both sides of the painting, one at an angle of 70° and the second by 45° on the plate, and that the headlights are It is almost two meters far from it for the scout, at an angle of 75° and one and a half meters for the scout, at an angle of 45° .
- 5- It takes into account the placing of the light eyebrow over the lens of the photography machine.
- 6- The light is above the lens of the photography machine, and this is only reserved from the reflection of the light inside.
- 7- There must be no type of optical filter (filters) over the lens of the photography machine so that there are no changes in the shades of colors or perhaps leading to unwanted results, except in some

necessary cases that require that, as will come at the time at the time
Talking about infrared and above violet.

8- Control the distance between the lens and the painting well and with full accuracy so that we can get the smallest details.

9- Read the light scale schedule used in photography to determine the opening and speed of the lens, and it is always better to choose the narrow openings to photograph the effects, with the intention of obtaining the smallest required details, the more the opening of the lens is the more we get more details, and it does not matter the speed in this case because the camera is installed above Pregnant and not afraid of shaking, especially if we use the external compressor. and this is only reserved from the reflection of the light inside.

10- Ensure that there are no light repercussions issued by the plate due to the presence of a varnish layer or headlights.

11- The image is taken after confirming all the previous circumstances, and it can be referred to the specialized books to stand on photography minutes, acidification and nature that require accurate laboratory procedures, and it has now become one of the detailed self-existing studies.

3- Infrared examination

In this way, the examination depends on the feature of the difference in the degree of reflection or absorption of materials for these rays, which we mean here with the word 'materials' is drawing oil or dyes used in coloring or varnish that the image usually drew after the end of its drawing to save it from weather effects.

Although the results of the researchers' experiences did not show a great benefit from using infrared photography in examining oil paintings, it has recently proven that this claim was not correct, the researcher Laurie wrote about the state of infrared scanning that showed a signature of the painter Rambrandt and no It is apparent to the naked eye - as researcher Tok (toch) came as a narration of the case of examining an oil image attributed to the painter Velasquez (sold for a hundred thousand dollars) whose infrared photography showed the presence of initial graphics (Sketches) what this painter was doing. Due to the difference in the appropriate era for these two drawings.

The Harvard University of Fogg Museum has published the benefit of the use of red rays to uncover modern repairs in an old panel after its painting with a layer of varnish, due to the cracking of the old varnish layer, so whoever made modern repairs tried to make artificial cracks in the part Which I fixed, however, it was possible to detect with infrared.

This has also been stated in the experiences of some researchers that infrared photography often fails in modern paintings, while he succeeds a lot in examining old paintings.

This phenomenon was explained by increasing the ability of these rays to permeate the old drawing oils, and their low ability for modern oils.

As a result of the experiments carried out by these researchers, the report was possible that the infrared ability to permeate the drawing materials (which are the materials that originally consist of solid

particles that are drawn in a transparent medium, the oil), depending on the size of these small particles and their natural properties, as stops On the oil refraction coefficient.

4- Infra Red

Infrared films are highly sensitive to the long radiological waves of visible light, and they are also very sensitive to long, invisible radiation waves.

And we must choose - when photographing the appropriate type of sensitive movie depending on the state of lighting and atmosphere, as well as the various acids used in showing, in the case of the landscape, the acid is preferred that is not given variation, and in the case of Photojarmetry, topographic and other artistic transportation, the opposite of that (i.e. a severe contrast) Contrast) .

The reflection of the blue color of the clear sky has a little effect on these films, so this color is in the printed image very dark because the sensitive movie was not affected by it.

The red or dark black filter is used to photograph in a dark place by lights and infrared photography used for many purposes, the most important of which are scientific research and laboratory tests of materials, most of which disappear under the normal lights in abstract vision, as well Displaced, in addition to its importance in crime science.

As for the archaeological field, it is of great importance in photographing the documents and manuscripts that have been affected by the factors of time, so you can no longer see with the naked eye, as

well as photographing paintings and monuments whose features, lines and colors differed.

And films in packages of different sizes as follows:

9×6.5 cm 12 ×9 ، cm15×10 ، cm18×13 ×cm24×9 سم، 24×6 ، cm ،
24×18cm.

5- Photography process

5-1 Expose

The dark red filter and a dark black filter use for infrared imaging because this special type of filter absorbs different types of short waves and leaves long red radiation that passes to the sensitive film.

And all photography companies produce multiple types that can be referred to by knowing the characteristics of each type and methods of use according to tables attached to the produced packages, and the exposure period ranges from ten minutes to a full hour under the lighting with photography headlines, and the experiment alone is a way to know the exposure period and openings according to the strength of lighting, distances and the type of filter used , And with the installation of the camera and lighting machine above a special holder that fits the required mode.

5-2 acidification: acidification is done in the normal way.

Washing, installation and drying

Also normal way

Note: These films are used within six months of the date of production, and they are kept at a temperature of 20 ° away from fumes and gases.

Tribal and enlargement

The printing and enlargement is on the paper sensitive to photography, so we get an accurate record photograph of the effect, whether for visible details or invisible details.

- **Advantages of infrared effects**

Obtaining an accurate image of the state of the effect and its external surface, and the cracks that it has, as well as reading the manuscripts that have been affected by the factors of time, as well as detecting the counterfeiting and imitating the counterfeit processes, so no matter how great fake and imitators are in making an accurate model of the effect that can be a great note that is not seen in the eye or photography ordinary.

6- Ultra- ViOLET Ultraviolet

The effect of multiple diseases, is more like skin allergies, that in the sense that the surface of the outer effect has a completely invisible disease, but not seeing it does not negate its existence, and the presence of dissolutions in the surface crust of the effects is fixed in all cases.

The artistic paintings in Europe, for example, are painted with liquid varnish after drawing it to protect them, but after the passage of time, this layer cracked and there are severe dissolutions that do not appear to the naked eye because this layer is thin and very transparent, but if we reflect the violet rays on it, we can see these dissolutions with the naked eye, if we want to register it By photographing her study closely, we must observe the scientifically followed method in that

and the practical methods studied, so we can detect the restored areas before that because of the different materials and colors used, so every material and color changes their color under these rays.

- Photography of the impact

The impact is placed in front of two or more UV lights, which are headlights that fix special bulbs for that, taking into account that the room is in complete darkness, and the rays cover the entire effect and one degree.

The photography machine is fixed above a holder and is packed with an ordinary sensitive film, and it is used for all films of various kinds with few standards that do not exceed 17 religion (17din), and .also placed on the lens of the UV or yellow filter

Exposure

The film is shown for about an hour and in complete darkness, with a slot of at least 8, for the film 17 religion (17din).

Acid

The film (negatives) is shown in the appearance of photography films and the following solution is completely suitable for work, either to develop ultraviolet or sub -red films and movies in general, as well as printing and enlarging pictures:

Meto.....12 grams

Sodium Salfit60 grams

Hydroquinone..... 12 grams

Sodium carbonate... 80 grams

Potassium bromide... 1.8 grams

Water to 1000..... cm 3

These materials are added in the aforementioned order to the water, preferably hot for the speed of dissolving until it cools and used at a temperature of 20 ° C.

- **Laundry**

The movie (negative) is washed for one minute in a basin with water

- **Installation**

The film is fixed in a compound solution of 200 grams of Hipo salt per liter of water.

- **Definition and drying**

The film (negative) is washed in running water for an hour to remove silver salts that were not affected by light or radiation, then the film is dried until it can be printed and enlarged. Tribal and enlargement

It is printed or enlarged by the photo amplifier, so that after that we get a picture that gives a clear idea of the state of impact, cracks, the poisoned layers, the cracked varnish and its dilemma, which we cannot see with the naked eye under regular light.

It is now clear that the difference between infrared and ultraviolet radiation is now, as the first gives an accurate recording of the impact of all its details, and the second gives a clear idea of cracks, restorations and cracks only.

It is printed or enlarged by the photo amplifier, so that after that we get a picture that gives a clear idea of the state of impact, cracks, the poisoned layers, the cracked varnish and its dilemma, which we cannot see with the naked eye under regular light.

It is now clear that the difference between infrared and ultraviolet radiation is now, as the first gives an accurate recording of the impact of all its details, and the second gives a clear idea of cracks, restorations and cracks only.

This, Professor Abdel -Fattah Riad mentioned in his book *Inspired Radiology* that UV examination depends on the different degrees of fluorescent brilliance resulting from the fall of these rays on the materials of the image, and this brilliance does not appear when examining the existing inorganic dyes, while it appears clear if the dye is Membership, and it was necessary for the color of the fluoride brilliance resulting from exposure to these rays is one of the distinctive signs of the type of material used in the drawing, but it is very likely that the expert will make mistakes in the report of the type (It often happens) Each of them had a distinctive brilliance for him if exposed to UV rays, and in addition to that there is another possibility of error that may be caused by the presence of varnish or preservatives of the image that the painters usually use after the end of the drawing process, as these materials also shine and mix the color Its brilliance with the brilliance caused by the oils and colors used in the drawing, which usually leads to a wrong decision.

For the previous reasons, ultraviolet examination is not considered of great value, except for rare cases, and it is nothing more than one of the means that fall within the usual routine to test the oil images, and that its results are taken always with a precaution.

UV source

Ultraviolet resource lamps vary depending on the purposes for which they are used, as well as the different companies.

There are photography lamps, other lamps to kill bacteria and exterminate germeicidal lambs

UV source (photography)

It is a mercury vapor lamp with average and high pressure as shown in drawing No. (3) (taken from the Book of Un -Perspective Photography by Professor Abdel Fattah Riad).

Its parts are composed of:

- 1- A three-screw or Qalaz.
- 2- Internal Fuse.
- 3- The first and second poles of Tongstan.
- 4- An internal tube that is often from quartz and there is the poles, and it has a drop of mercury that evaporates with high temperature when the current passes, and some argon gas.
- 5- Wood's Glass Glass

UV source (to exterminate germs)

It is a low -pressure mercury vapor lamp, and it has been prepared to kill bacteria, germs, sterilization and disinfection, and it has a mixture of helium, argon, mercury vapor or neon gas.

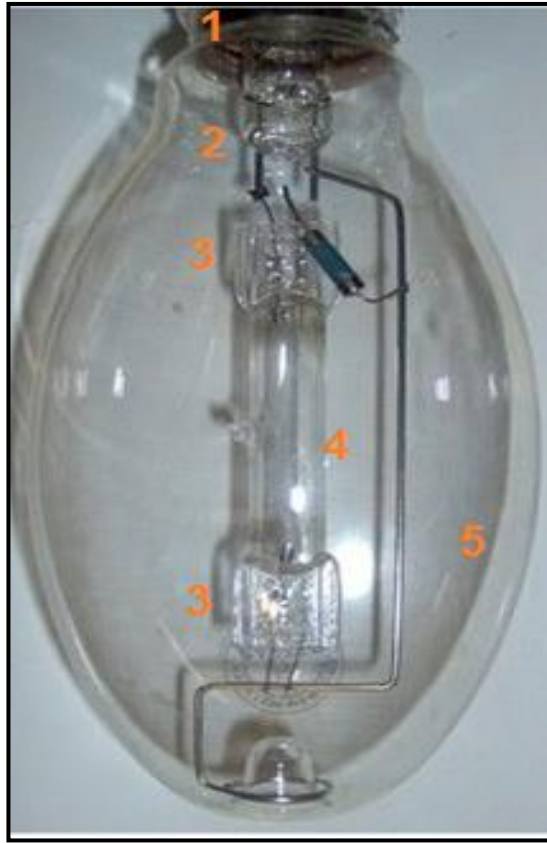


Figure 3: M? Average and high -pressure vapor lamp

1- A- A three-pin bayonet cap

2- Internal Fuse

3- The first and second electrodes are made of tungsten.

4- An internal tube that is most likely made of quartz and contains the electrodes, and it contains a drop of mercury that evaporates as the temperature rises when it passes. Current.

5- An outer casing of Wood's glass with a dark violet color approaching black.

This lamp is known by the trade name TUV (Tubular Ultra-Voet) and it also has different shapes, including spherical, elongated, and tubular in shape (neon tubes), which are suitable for installation Inside a reflector in groups using a transformer for each bulb separately. We used the tubular type in the treatment and maintenance of whale bones

at the College of Science at the University of Riyadh in the Kingdom of Saudi Arabia in 1974 AD, to kill the germs and bacteria spread in them.

warning:

When photographing UV lights or exposing the effects to kill bacteria and germs, the eyes and leather must be protected from exposure to the waves of these rays, so covering the body with clothes or dark barriers.

Spectral analysis

Successful restoration methods depend on knowing the characteristics and compounds of the archaeological materials to be restored and maintained. So that the restoration and maintenance materials do not use the wrong use that leads to unwanted interaction or activity, between the restoration, maintenance and treatment materials, and between the same archaeological materials and elements, which may help increase damage to the effect during treatment and restoration.

Therefore, the spectral analysis of the materials has become one of the successful means of detecting the quality of damage in the antiquities, with the analysis of the materials of materials, and has a direct link in this field. When we know the exact composition of the material, we can determine the appropriate maintenance materials, as well as determine the methods of treatment and restoration.

And the use of the method of spectral analysis, or other previous or following methods of detection, depends on the need to need it,

whenever it requires that, and the spectral analysis of the materials is carried out using.

Emotion Spectrograph

The lights issued by the combustion of the material can be analyzed to the different spectrum colors, when putting a sample of any material between two carbon poles to burn it, this results in a severe flame that contains distinctive colors that can be obtained through a glass post, and appears in the right order in the right: purple - Green-yellow-red, and the shades of colors between them (Figure No. 4), which differ from one material to another, and can be distinguished according to the fixed tables of that, or by comparing them by burning a pure material of the same type on two carbon poles on the other side.

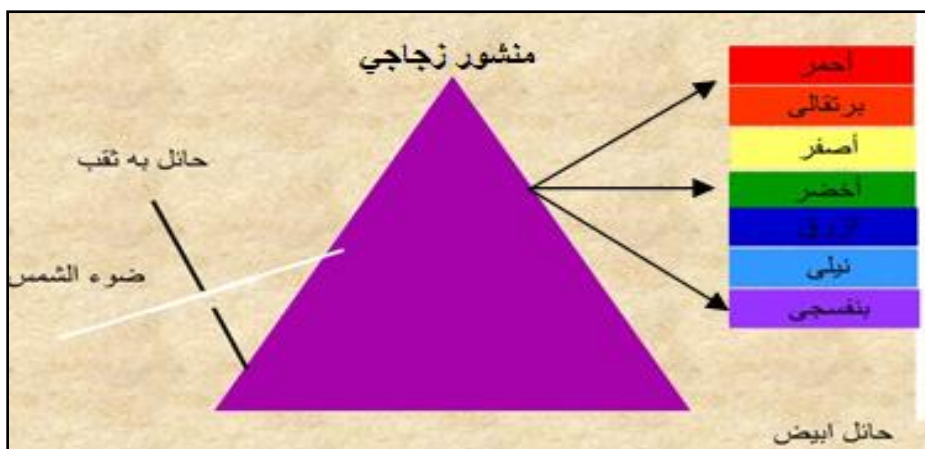


Figure 4: A diagram of light analysis within the glass post

The analysis of the spectral emission has evolved greatly, and its devices were numerous until research reached impressive results.

Emostrograph emissions

The emission is made up of the following parts:

A- Source Source

It is a well -carbon (graphite) electrical connection, connected to a high electric voltage source of about 5 kV. The carbon poles are according to the nature of the sample to be analyzed. The carbon pole connected to the negative pole (cathode) is hollow, so that the sample is allowed to place it. As for the positive electrode, it is pointed or flat (see Figure 5).

Patriot

The body of the patriot consists mainly (see Figure 6) of an entry hole, where light enters from it heading towards the publication passed through a combined lens, so the light is analyzed during the publication to the different spectrum colors, starting from the ultraviolet rays and then the violet color to the red color, and that depends on the length The wave of each spectral line emanates from the sample and then the light passes through another combined lens that falls on a sensitive photography movie, and it should be noted that the process of light analysis can be done by using a Diffraction, as it is characterized by the power of dispersal (i.e. the power of the analysis) is better than the publication.

A- Detector detector

The spectrum lines resulting from the sample can be detected by registering with a special photography machine that receives the spectra emitted on sensitive films, and the film usually used in such purposes, is a glass panel of 9 x 18 cm. It extends from UV, visible light, even the area near infrared.

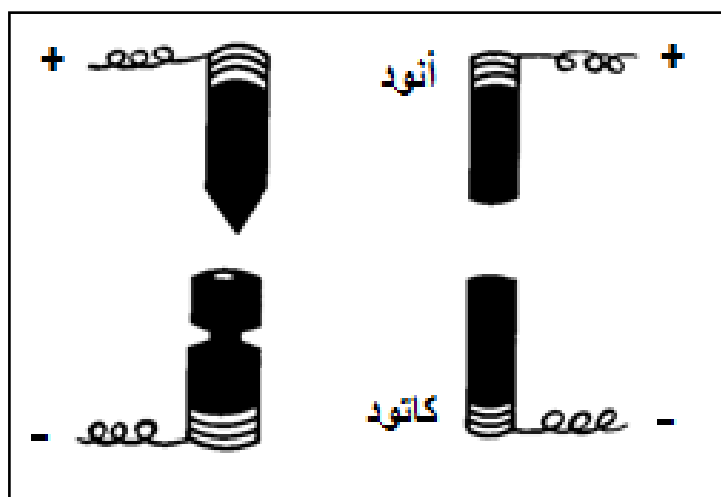


Figure 5: A diagram of carbon poles with the spectral analysis (ESPTROSP)

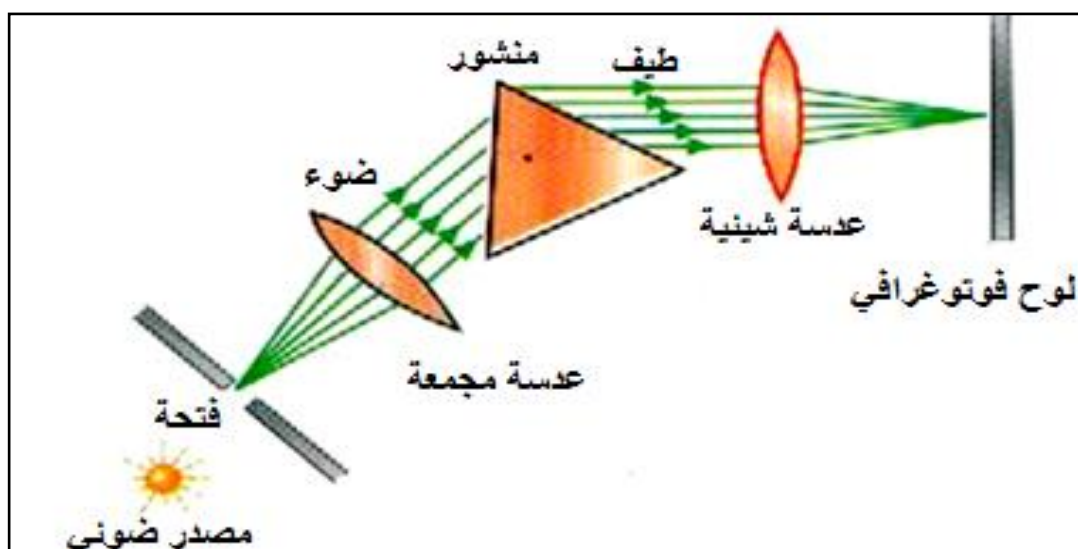


Figure No. 6: A schematic drawing of the parts of the spectroscopy device .

Work method:

- 1- Grind the sample well (in a special hoos of agate), mix a certain fixed percentage with graphite powder, and be ground together. Then it is placed in the previously mentioned cathode cavity (Figure 5).
- 2- A certain distance is seized, estimated at approximately three milligrams between the cathode and the vehicles, then the high voltage connected to them is connected, so an electrical spark occurs as a result of the ionization of the air layer confined between the two poles, resulting in a very high temperature of more than 4000°C according to the value of the specific current and it occurs. The sample burning results in emission of the balanced spectrum.
- 3- The combustion time control is determined according to the nature of the spectrum required to be produced from the sample, ranging from 3 to 10 seconds.

4- After completing the filming process, the film is raised inside its Cassette box, and it is removed from it inside a dark room to show it with a special solution at a temperature (20 ° C) and then placed in the installation solution for ten minutes, then it is dried. So the process of recording the distinctive spectral lines of the sample has been done.

5- To learn about the frequencies of the spectral lines resulting from the sample, the film is placed in a Projector special device, and by comparing it with another standard film, the components of the sample can be identified.

6- To set the degree of concentration of the component of the sample, the film is placed in a Densitometer special device to measure a darker degree- that is, the severity- each spectrum thread. The colors of the spectra appear above the sensitive movie after it is shown in white and black only. Each color- as is known in photography- has a special degree between light and dark, and thus colors can be distinguished from each other.

By comparing it with the codified tables of the characteristics of the comparative material, as well as the distances between them, their number, frequency and darker intensity, strange materials can be known when examining the effect to be restored.

It should be noted that this advanced method is the newly used due to the accuracy of its results, as we can get a concentration of a component in the sample, to an extreme degree of accuracy that reaches a portion of a million grams.

X -ray

X -ray imaging has now become one of the most important ways to detect the places of damage in the antiquities and know their nature, and see what may be inside it and it cannot be seen with the naked eye from the outside, and that is to take a picture of it by the X -ray imaging device, and the used device was designed in the restoration institutes specifically even It meets the archeology photography needs, and the device is a tube inside which is a source of X -rays that are carried out through an opening on the side of the tube, and its power is 7.6 to 10 angelsum, and is installed in the device so that it can be moved in all directions.

When exposing the impact of this radioactive source, the X -rays that some bodies or materials intercepted it invented it, and the rays can be received on a phosphorous screen, to give the result of the examination in the form of bright points and enable us to a negative vision of the effect. And when a sensitive movie is exposed to these rays in force from the effect, we get a negative movie, we can keep it if necessary.

What concerns us here is not the study of X-ray or radiographic rays, but rather the result of which we obtain it in a visual image or a clear film through which it is possible to determine what the impact contains strange bodies with determining the direction of each of them such as iron nails and internal deposits, as well as the discovery of graphics layers in The state of oily paintings and hills, it is known that the painter depends in the formation of colors on the white color to give the required effect in the degree of clarity Vinegar on it (acetic acid) turns into zinc or bullets. If it is also called carbon dioxide, the result is converted into basal zinc carbonate or basal lead carbonate, which represents the white color.

In the event that a plate is placed as for a source of X-rays, the vertical rays pass inside the layers of the plate and the colors in which each color contains a quantity of white color, which ranges in its amount according to the clarity of the color and its multiple degrees- so the rays of the colors are implemented in a quantity commensurate with the amount of color White. The higher the white color, the less the rays inside the color, in addition to some distinctive metal impurities for each color, so we have degrees of window rays, the final shape of the painting, which can be received after that on a sensitive movie. The white part of the film means that the rays do not reach it, detention, or not penetrate it in the material, which indicates the presence of the white color, and the black parts of the film means

that the rays reach to it and not to be detained. Radiology for the shades of colors and the amount of white color in them.

In some cases, we may see an image over another, or some of the poisoned or re -drawn parts and renewed it again, and it can also be known whether the painting is original or a copy of it in the event of several copies of the same image or to know its percentage of the artist who drew it, and that is by comparing between The direction of the brush and the artist's touches for different paintings, it is always proven that each artist has a special direction and the effect of putting his touches and colors over the image.

Among the results we obtained when examining a candlestick of bronze by X -rays to determine the method of pouring the bronze, its manufacture and its history, and whether it was pouring bronze in the manner of sand or slices, or in a wax method, the candlestick was photographed with X -rays to verify that, so it appeared in a conclusive way that the method used is the wax to exist Nails installed from the inside were not visible and are known to be used in the process of casting with wax in modern times.

Also, the path of cracks and fractures within the effects and wooden and bronze statues can be determined, whether they are visible surface cracks or invisible cracks until the proper method of treatment is determined.

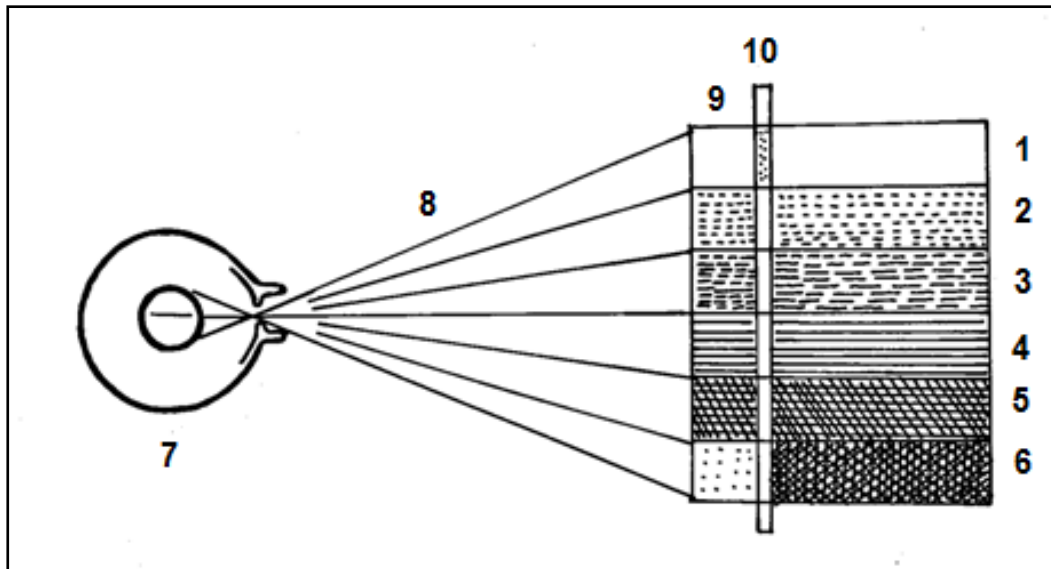


Figure No. 7: The source of X -ray and its impact on the sensitive movie

- 1- White is not out of the rays at all.
- 2- The rays were carried out in a very small amount.
- 3- The rays were carried out in a small amount.
- 4- The rays were executed in a medium amount.
- 5- The rays were carried out in a large amount.
- 6- The rays were able to implement the entire.
- 7- X-ray source.
- 8- Radiology path.
- 9- Photographer.
- 10 -Reverse Colors.

To perform the examination using an X -ray device with a power of 200 kV, 3 mAh to photograph the thin parts of the trace, exposure periods ranged from one to ten minutes according to the thickness of the effects of the impact, and according to the dimension between the source of the rays and the pictorial parts.

As for the thick parts of the effect, they were used in photographing Gamma Rays from the 60 Cobalt source.

The dimension ranged between the source of the rays and the pictured parts between 8 to 25 feet, and the exposure to one image took nearly ten hours.

Thus, the importance of X -ray imaging that has now become an effective steps, which has benefited the restoration around the world, and helped to discover many phenomena that have not been discovered before the nature of raw materials and effects with the identification of the age and artistic style.

Determine the age of antiquities

introduction:

Archaeologists face the problem of discovering unlimited antiquities, and since the definition of the effect of the effect is of great importance in the field of archeology and in other areas such as determining the age of rocks and geological times, which is beneficial to the human being in exploiting the natural lands of the land, scientists and researchers have turned to Exploiting the results reached in the field of age identification, such as the use of carbon 14, argon-potassium, and fluorine gas 0

And since these methods combined or separate have proven the validity of their measurements and their success to a large extent in determining the age of the impact, with some slight differences up and down, so we saw that we give a general idea about it for all archaeologists and the secretaries of archaeological and artistic museums and to workers in the field of restoration, maintenance and treatment of antiquities in particular.

1- Radio Carbon 14 dating radio 14 Radio Carbon 14 dating

All living organisms contain carbon, and all organic materials that make up the cells of plants and animals. Carbon exchanges carbon dioxide with air air in the metabolism and breathing process. Upon death this process stops and carbon vehicles decompose with the help of bacteria and give carbon dioxide (see Figure No.).

Most of the carbon atoms are stable, and their weight is 12 and as a result of the ejaculation of the air with cosmic radiation on

constantly constant of outer space, a small percentage of carbon atoms turns into a radioactive image known as carbon 14, as the atomic weight of these atoms is 14.

And since these radioactive atoms, they are unstable and slowly dissolved, and turn into stable nitrogen atoms and their atomic weight 14.

And since there is a balance between the new carbon atoms generation and the dissolution of these atoms to Nitrogen 14, the number of carbon atoms 14 in the atmosphere remains fixed.

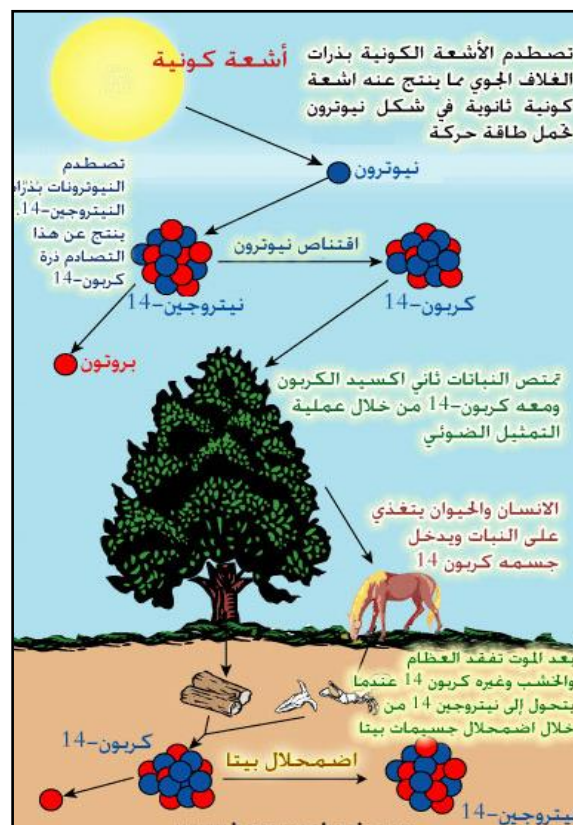


Figure number: the physical background of radioactive carbon formation in nature And its absorption by living organisms

Dr. Zaki Iskandar sees only that, as the infraices that reaches the atmosphere of cosmic rays collide with the atoms of nitrogen (no carbon as it is mentioned), whose atomic weight is 14, turning it into radioactive carbon weight 14 and proton:

And since every living organism exchanges carbon dioxide with air, the same balance occurs in the bodies of these organisms, and therefore all the living organic materials contain radioactive carbon with the same percentage that is found in the air, but after death, this begins The balance in the change due to the lack of compensation for the amount of carbon 14 (which is not dissolved) from the air as was the case during life, so this radiological decay process reduces the number of carbon atoms 14.

And since the speed of this decomposition does not change under any circumstances, after 5000 years have passed, half of the number of carbon atoms is found in a living organic material, and after 10,000 years, a quarter of its original number remains and after 15,000 years t Dr. Zaki Iskandar states that the half -life period for Karboun 14 was 5560 years, at a discretion of Bay in 1949 AD, but recent research is estimated at about 5730 years, that research is still ongoing to estimate this period with more accurately.

At the University of Chicago, a carbon 14 detection method and an estimate of its percentage in dead organic materials, and this method has become known to the archaeologists who can use it, but rather they really use it, to prepare a time scale for estimating the relative

ages of dead organic materials, such as wooden lists, textiles, and not, They find them during excavation, and this way can be estimated in the way of approximation in the years. he number is price, and so on. Unfortunately, however, this method is very expensive, and it requires destroying the archaeological organic material and destroying it by burning. Dating using this method is only used when such material can be dispensed with.



Figure No.: Steps followed in determining the age of an antiquity using the Geiger-Muller device

Jayger-Miller counter:

It is a Geiger detector, the principle of its work on the collection of electrical charges (electronic and ionic) resulting from the ionization of the atoms or gas molecules when the nuclear radiation passes (alpha, beta, gamma) in it. By measuring the resulting electrical charge or the resulting current, the passage of radiation in the gas can be detected.

Where the Jayger-Miller counter consists of a metal cylinder and from a metal wire composed on the axis of the cylinder and fills the cylinder with an inexpensive gas or a mixture of argon and methane, and one of the two ends of the cylinder ends with a thin window of mica that allows the entry of nuclear particles and gamma radiation. The center passes the center with the positive pole of an electrical source and connects the cylinder body to the negative pole of the electrical source.

And the age of the sample can be calculated based on the following equation :

$$t = 8267 \cdot \ln(N_0/N)$$

where :

- N_0 is the number of isotope atoms in the original sample (at time = 0)
- n is the number of remains of the remaining atoms in the archaeological sample after T from time.

Argon-Potassium Dating

Potassium is an ingredient that is usually united with other elements in the minerals, and one of the radioactive potassium isotopes is potassium with atomic weight 40, which turns very slowly into Arjun, which in turn remains calculated among the granules of the mineral material.

The age of the mineral substance containing potassium is estimated at an estimated amount of potassium counterfeiting, which has turned into arjun, and that is done by finding the percentage of argon to potassium in the mineral material, and if the size of the granules of this substance is large, then a correction of this percentage must be made to compensate for the amount of argon that leaks or graduates from the material, This method is suitable for estimating the ages of .rocks over the age of 10,000,000 years at the level of geological times

1- Tre-ring dating annual rings method

This method, which has long been known for the number of tree trunks rings, depends on each year, as a year is a growth in the life of the tree, although this method is limited to the application, but it can be the great benefit in the sites where fossilized trees are located.

Dr. Zaki Iskandar says, “This method has been widely used in recent years to determine the life of wood, precisely, in which there is no doubt and that is to compare its results with the results of the radio method, Carbon 14, so that the reasons for their incompatibility can sometimes be known with their archaeological history,” and therefore the mathematical laws can be improved. Throughout the ages of

wood, Radio Carbon 14, and the history of the annual rings depends on comparing the annual rings in the wood taken from the same place, as these rings take a distinct form from others because of the weather conditions in which they were formed, and when there is the same shape of the ring in the trunk of trees of different history A sequence can be made from one or a piece of wood known to another. This sequence can be referred

The years, compared to the installation of the rings of this sequence with any other piece of wood of the same type and the same place can be estimated with this piece of wood accurately.

Archaeological models and forgery

In many museums and archaeological areas, we find multiple models of one origin that have been made by different artists with the aim of repeating a statue, image or immediate.

In the halls of museums, archaeological areas, or markets for selling and exchanging antiquities, fake models may be found in the accuracy of the automated assets that are made, or may exceed them at times, which makes the distinction between the original and the image one of the most difficult things.

The need in ancient times called for the cloning of many artistic and literary works due to the intense demand for them and the desire to either acquire them or use them in religious, social and scientific life.

The number of nasists (Copyist and plastic artists specializing in this type of work increased according to the increase in demand for some artistic and literary works as an urgent necessity to make Copies - according to the original - for it. Publishing and printing means that help to repeat multiple copies, as we see in our present time, from the progress of different means and methods of publishing, whether they are printed, illustrated, engraved or copied models.

The desire of a person to maintain the external appearance of the original form not only stopped, but also exceeded this content in most of the stages that followed the use of advanced means and methods.

After the copyists or the carriers of the origins depend on the implementation of their models on their personal ingenuity and the strength of their observation and their knowledge of the secrets of the artistic industry in addition to the exact experiences and manual skill Miracle or almost.

The basis for completing this work - as I mentioned - was the desire for acquisition or for religious, social, or scientific uses. Until some model makers in every era have deviated from their honorable scientific purpose to using methods of fraud and deception, and it became known in Crimonologie as forgery and falsification. Inside corridors and basements where their eyes do not see the light of the sun or day.

Despite the conviction of the copycats or counterfeiters, and the counterfeiters or counterfeiters in carrying out their work, fortunately, there are many scientific means and methods that enable the

distinction between the original and the model and discover cases of forgery and counterfeiting, no matter how extreme. Those who do it hide the touches of their hands in various deceptive ways.

And if you are talking about archaeological and artistic models, forgery and forgery as a whole, then- without a doubt- I do not combine the carriers of the models on their goodwill and the honor of their purpose, the balanced and fake with their poor purpose for cheating and deception because the methods and means are the same, but the purpose and the goal differ.

1- Study the original with the naked eye and under the enlarged lenses, which is one of the means of detecting damage in the antiquities and recording all small and large notes so that the implementation program can be placed in successive steps.

2- Photography of the original photography under the different lighting corners of the projection to get the fine details.

3- Infrared originality photography to obtain the most accurate details invisible with the naked eye so that it can be implemented in the form.

4- Imaging UV rays to determine repairs, restoration and old correction, if any.

-5Analysis of some different samples for the materials, colors and pillars to determine their types and components accurately so that they can be referred to in choosing implementation materials to make the model - and this is achieved for us with chemical analysis or spectral analysis and combining the two methods gives us the most accurate results.

5- Analysis of some different samples for materials, colors and pillars to determine their types and components accurately so that they can be referred to in choosing the implementation materials to make the model - and this is achieved for us with chemical analysis or spectral analysis and combining the two methods gives us the most accurate results.

6- Take a picture or several X-ray images to determine the state of the original from the inside and the invisible or hidden parts, until it is taken into consideration during implementation.

7- Study the artist's style in general and especially in the original to be implemented by a model, through the previous means combined and what can be extracted from its studies. As each artist has a special brush strike - the fingers of the fingers - when putting colors and these differ from one artist to another, as well as the roads of different colleagues when carving a statue or a prominent painting, and there are those who are in study to the extent that he creates similar tools for what the artist used and to reckon his personality and work In his style and turns into an accomplished actor and imitator until he integrates his work during the implementation of the model.

8- Preparing and equipping all the necessary materials and tools that are suitable for implementation from the reality of the previous steps, with familiarity with the methods of preparing different colors.

Bibliography :

1. الدباغ تقي ورشيد فوزي ، علم المتاحف، مطبعة جامعة بغداد 1997
2. العزاوي عمر جسام، موجز علم الآثار، دار الكتب العلمية، بيروت، 2013
3. الشينيتي محمد البشير، التراث الحضاري ودور البحث في تثمينه، مجلة الآثار، الجزائر، العدد 4، أكتوبر 1990، ص 15-24.
4. بويحيوي عز الدين، المحافظة على التراث الوطني من وجهة نظر علم الآثار، مجلة التراث الأثري عمران و عمارة، العدد 16، وزارة الثقافة ، الجزائر ، العدد 16، ديسمبر 2007، ص 5-19.
5. حاجي يحي و قجال نادية ،التراث الثقافي المادي و اللامادي ودوره الأساسي في بعث السياحة الصحراوية، مجلة جماليات، جامعة مستغانم ، العدد 5، نوفمبر 2018، ص 124-148
6. كفاني زيدان عبد الكافي، المدخل إلى علم الآثار، مؤسسة حمادة للدراسات الجامعية . والنشر والتوزيع، الأردن، 2004
7. خلاصي علي، حماية سَلَم القيم بحماية الثروة التراثية والموروث الثقافي، مجلة التراث الأثري عمران وعمارة فن وصناعة، الجزائر، العدد 16، ديسمبر 2007، ص 20-31.
8. عزوق عبد الكريم ، التراث الأثري : مفهومه، أنواعه، أهميته، حمايته و استغلاله كثروة اقتصادية، يوم دراسي حول التراث الأثري قيمة اقتصادية، جامعة الجزائر 2 يوم 11 جانفي 2017، ص 1-7.
9. ضو. جورج، تاريخ علم الآثار، تر. بهيج شعبان، منشورات عويدات، بيروت -باريس، ط3 1983.
10. القانون 98-04 المؤرخ في 20 صفر عام 1419 الموافق 15 يونيو سنة 1998 ، المتعلق بحماية التراث الثقافي، الجريدة الرسمية ، العدد 44، الصادر بتاريخ 17 يونيو سنة 1998 ، ص 3-19.
11. مرسوم تنظيمي رقم 85-277 المؤرخ في 29 صفر عام 1406 الموافق 12 نوفمبر سنة 1985، يحدد القانون الأساسي النموذجي للمتاحف الوطنية، الجريدة الرسمية ، العدد 47 ، الصادر بتاريخ 13 نوفمبر 1985 ، ص 1726-1730.
12. مرسوم تنفيذي رقم 07 - 160 مؤرخ في 10 جمادى الأولى عم 1428 الموافق 27 مايو سنة 2007 ، يحدد شروط إنشاء المتاحف ومهامها وتنظيمها و سيرها ، الجريدة الرسمية ، العدد 36 ، الصادر بتاريخ 3 يونيو سنة 2007 ، ص 9-14.
13. مرسوم تنفيذي رقم 11 - 352 مؤرخ في 7 ذي القعدة عام 1432 الموافق 5 أكتوبر سنة 2011 ، يحدد القانون الأساسي النموذجي للمتاحف ومراكز التفسير ذات الطابع المتحفي، الجريدة الرسمية ، العدد 56 ، الصادر بتاريخ 16 أكتوبر سنة 2011 ، ص 5-10.
14. ناجح عمر علي، علم التنقيب عن الآثار، دار العالم العربي، القاهرة، 2015