

**Cairo University
Faculty of Archaeology
Department of Conservation**

**An Analytic Study to Restoration of Terrestrial
Byzantine Mosaics Applying to A Selected Example
from Sinai**

A Thesis

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The world has witnessed in the recent great interest the process of reviving the heritage of the world and represents a great importance, and held numerous conferences for the exchange of types of expertise in the restoration of cultural relics, and among the most important acquisitions, which are of particular importance is the revival of the mosaics, as this art, since the knowledge rights since the Sumerian period, which extended to use it until now, but once flourished, and stepped down as lead times, but that as a result of the implementation technique still maintains its splendor.

Where is the Mosaic one of the oldest visual arts that does not use a brush or color, which gives us the background and a clear manifestation of any of the civilizations successive eras booming, the art that interested in the details of things and go inside the depths to take effect through solids, to the meaning of life ... It is the art of cohesion and tangles.

Occupies a mosaic high level of prestige among the ancient arts that lasted until our time, known as Mosaic: "as the art of decorating a surface, whether these surfaces, wall or floor is decorated with paintings that do not use color brush, but use small pieces of raw color pool next to each other to be in end design you want, "and be used for cutting different shapes including rectangle, square, circular, octagonal and other times using random pieces section and we grouped together to design an integrated decorative.

Byzantine era saw a major development in the manufacture of mosaics because they brought in the manufacture of glass, metal, mosaics and used largely in the third century and fourth century, white, black and Fberawa filmed the life of the sea, fish and animals.

Deal with Byzantine mosaics topics related to some extent aspect of religious pursuant to the principle: that the picture needs a thousand words, and in part of which was associated with myths or to address everyday life with portrayals of individuals or the various objects, in contrast to the mosaic in the Islamic era associated with highly geometric and plant motifs.

For the mosaic of Byzantine Egypt have seen the peak of greatness during the era of Emperor Justinian, and evidenced by the mosaic of Transfiguration, St. Catherine where the incomparable

mosaic church of Hagia Sophia Bhadharp the Byzantine Empire of Constantinople, and spread the mosaics in Egypt and by extension places settlements Byzantine in Egypt from Alexandria to the borders of Egypt, the West through the Delta and continues to excavations reveal more of the work of the mosaic.

There are many of the mosaics exposed to damaging conditions, whether supply or poor storage or use of wrong methods of repair and in need of maintenance and restoration of both places of archaeological excavations or some of the palaces and royal parks as resting Bidwina property, has been recently found by one of mosaic floors Bafarama North Sinai They are stored Scientific Center of the effects of Sinai, has retained much of the ground detail and need intervention to restore them. The importance of this mosaic that she goes back to the Byzantine period and was therefore chosen subject where the practical application of it.

The study examined ways to implement, raw mosaic and tools used in the implementation and the factors destroyed and Mataatrkh manifestations on the surface of the mosaic, and methods of the tests used to find bricks, mosaic, and the degree of damage, which hit a view to address the effects of damage and rehabilitation of the ground for re-submission and to highlight the aesthetic.

Panel is composed of mosaic regularity is usually a large number of small pieces of colored image that represents the whole landscapes or paintings of human or animal... And is now still coexist with those of ceramic and marble... Mosaic is the art of Alasralbiznty distinctive art of the Sumerians before them, but the first ray of the manual is the Romanians in the first century BC, black and white, Fberawa filmed the life of the sea, fish and animals are mosaics of ancient arts, which kept the rights.

Find many of which are in addition to Egypt, Greece, Italy, Cyprus, Malta, Morocco, Tunisia, Spain and Portugal and the Mediterranean basin generally have been attempts by some artists to develop it. But the weight and the weight and the difficulty of moving the high cost of severity and difficulty of availability in some countries, led to reduced, and there are specialized schools for his education in the Arab countries, but it's easy to be applied in any place and time, not worry about damaged his stamina and intensity afford, and needs to be offline in the case of used for graphics such as) portrait) (Silent

Nature) and others, in other cases be entered in the field of decorative easy application,. And could be applied as a matter of hobby to purchase materials from multiple places and start the application.

The mosaics are of all kinds, whether floor or wall, stone or glass to the various types of damage, and without making repairs and regular maintenance to continuing to not collapse and perhaps disappearing altogether. The message of this analytical study for the restoration of Alvevsaoualordip dating back to the Byzantine era and includes six chapters board integrated with each other to achieve the objectives assigned to it a letter, and will be addressed through the six chapters: -

Chapter I:

A comparative study of the origins and evolution of the art of Byzantine mosaics be dealt with the emergence of the Byzantine Empire, and the cause of the origin and ages of the strengths and weaknesses of the empire, Egypt's status within the empire and its impact on art and the emergence to differentiate between art, Byzantine and its impact on the evolution and characteristics of the mosaic spread during the era of the empire, also addressed the manufacturing technology, mosaic materials and tools used in the implementation and the types of mosaic Byzantine different nomenclature based on the method of implementation, and combinations of layers of processing necessary for creating a mosaic.

Chapter II:

factors and manifestations of corruption Byzantine mosaics And it has been the division of factors damage to the mosaic: internal factors, which include manufacturing defects of materials used in the implementation of the mosaic, and disadvantages of operating Turkibb.

And external factors which include: mechanical damage, damage to chemical, different rates of heat and humidity, and the crust black, hard crust and damage biological impact of micro-organisms, and damage to a human intentional and non-intentional and add to it also exposes the monumental wrong during the excavations. And monitoring of factors and manifestations of damage through a field study of some archaeological sites in Lower Egypt and Sinai.

Chapter III:

Methods and techniques used in the modern world treatment and restoration of the mosaics. Was the presentation of the reasons for the removal, and basic principles of disarmament, and the preparation of the mosaic of storage and uses of the rear of the fire and the most important types of pregnant women alternative, which is installed mosaics demilitarized with a review of the advantages and disadvantages of each carrier separately, then treat and repair the surface of the mosaic of cleaning mechanical, chemical and extraction of the salt and remove Altbakat from the surface of the mosaics and ways to implement the prepare materials to vulnerable areas, and to compile cubes broken and updating and methods of the various theories that govern the updating process, and to address gaps, and insulation, also addressed the issue of storage and conditions to be fulfilled in the materials and raw materials warehouse and ends with the types of presentations about the work Alveveva.

Chapter IV:

Methods of testing and analysis components of the application of floor mosaics on the floor the subject of study ,this chapter addresses the most important methods of examination, analysis of components of the floor mosaics are stored Scientific Center of the effects of Sinai (the subject of study), where samples were taken from the cube surface mosaics, layers of mortar layer of mulch, the mainstay, the soil was tested and analyzed to determine the effect of damage and the factors leading to the damage, and salt are located and to be applied during the weathering of the dice during their modeling empirical studies has been analysis by X-ray diffraction as well as the screening electron microscope scanner, and microscope polarized, and the use of ultrasound to find out the installation cube mosaic in various colors as well as the porous components of the mosaic to test their acceptability for prepare materials, as well as their vulnerability Baltjoip future.

Chapter V:

Experimental pilot study of some of prepares materials, syringes and Monet, pregnant women, the proposed alternative were divided into two parts deal with the first testing and analysis, materials and raw materials pregnant proposed alternative Khawwaml alternative mosaic demilitarized, and experimentation to each holder of the development of best pregnant alternative to use when the application, also addressed the use of materials the rear of the fire on the fabric and wood, and the best materials used in the

relay and then study their impact on mosaic cubes measure the strength of the weak and the penetration of each article in order to strengthen the development and strengthening of appropriate material preference for practical application, also addressed the use of mortar alternative to link the work of the Mosaic Stand after the original shorthand mortar damaged.

The second aspect included experimentation on the implementation of a sample of the mosaics and a limitation on it and then follows the methods used in the removal and re-installation and updating them.

Chapter VI:

The practical application of disarmament and the treatment and re-install Byzantine mosaics Beloziom area in Sinai, addressed the gathering of historical studies and archaeological sites on the floor mosaics (the subject of study) and studies environmental and climate on the environment of origin of the ground, testing virtual ground to study the manifestations of damage are, then the work of removal and re-installation on a new holder, followed by the work of the different cleaning (mechanical, chemical) and the work of Interpolation and strengthening, and the final cleaning and removal of the mosaic floor in question, and came in a series of conclusions and recommendations that have been reached through the study.

جامعة القاهرة

كلية الآثار

قسم ترميم الآثار

دراسة تحليلية لترميم الفسيفساء الأرضية البيزنطية

تطبيقاً على أحد النماذج المختارة من سيناء

رسالة

لنيل درجة الدكتوراه في ترميم الآثار

مقدمة من الباحث

وائل زكريا أحمد البليهي

تحت إشراف

أ. د / منى فؤاد على

أستاذ ترميم الآثار وكيل كلية الآثار لشئون خدمة المجتمع وتنمية البيئة

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٢٠١٠ م



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
وَمَا ذَرَأَ لَكُمْ فِي الْأَرْضِ
مَخْتَلَفًا أَلْوَانُهُ إِنَّ فِي ذَلِكَ
لَآيَةً لِّقَوْمٍ يَذْكُرُونَ

صدق الله العظيم

النحل : ١٣

الإهداء

إلى زوجتي العزيزة ، وولدي فاطمة ومهند

الشكر والتقدير

نسأل الله من الحمد ما يبلغ قضاء حقه (وإن حقه لعظيم) ومن الرشده ما يكتب
سلامة نياتنا فى الطريق إلى كرمه وإنه لكريم ، فله تعالى الحمد والمنة ، وبه العون
والقوة ، ومنه الفضل والنعمة .

أتوجه بكل الشكر والتقدير للأستاذة الدكتورة / منى فؤاد لما بذلته معى من مجهود ، ووقت ثمينين وما أفاضته على من علمها وتفضلت به من خبراتها فجزاها الله عنى خير الجزاء

كما أتوجه بالشكر إلى الدكتور / جمال قمح أستاذ الجيولوجيا بجامعة المنوفية لمجهوده وما تكبده معى من مشقة .

للأستاذ الفاضل / أحمد راضى عبد الفتاح مدير عام ترميم وجه بحرى سابقاً . ولايسعنى اللسان بالتقدير للأستاذ / الغريب على سنبل مدير عام ترميم آثار ومتاحف سيناء والقناة والسادة الأفاضل د / وليد كامل ، د / أحمد صلاح لما ذللوه من صعاب أثناء إجراء الجانب التطبيقى .

وجزىل الشكر للسيد / سامح المصرى مدير عام ترميم آثار ومتاحف وسط وغرب الدلتا والزملاء الأفاضل :جورجيت ، ياسر جودة ، سعيد بلال ، أحمد اللولى ، سامح ، أمانى ، إيمان ، كمال ، رضا ، فاطمة وأخى الصغير مصطفى أبو الفضل لمعاونتهم المخلصة .

وأتوجه بالشكر الجزيل إلى الأستاذ الدكتور / أحمد شعيب أستاذ الأحجار بكلية الآثار جامعة القاهرة ، والأستاذ الدكتور / محمد هلال بكلية الفنون الجميلة جامعة الإسكندرية لتفضلهما بقبول مناقشة هذه الرسالة.

وأتوجه بالشكر إلى إدارة الدراسات العليا بكلية الآثار وأخص بالشكر الأستاذ / محمد بغدادى .

ولايسعنى إلا أن أتوجه بشكر خاص إلى زوجتى العزيزة وولداى فاطمة ومهند على ماتحملوه طوال فترة البحث .