37. ARAŞTIRMA SONUÇLARI TOPLANTISI 2. CİLT

T.C.
KÜLTÜR VE TURİZM BAKANLIĞI
Kültür Varlıkları ve Müzeler Genel Müdürlüğü

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17-21 HAZİRAN 2019
DİYARBAKIR

T.C. Kültür ve Turizm Bakanlığı Yayın No: 3655/2
Kültür Varlıkları ve Müzeler Genel Müdürlüğü Yayın No: 188/2

YAYINA HAZIRLAYAN
Dr. Candaş KESKİN

17-21 Haziran 2019 tarihlerinde gerçekleştirilen 41. Uluslararası Kazı, Araştırma ve Arkeometri Sempozyumu, Diyarbakır Dicle Üniversitesi'nin katkılarıyla gerçekleştirilmiştir.

Kapak ve Uygulama
Başak Kitap

e-ISSN: 2667-8837

Kapak Fotoğrafı : Tahsin Korkut
2018 Yılı Mardin ve Batman İlleri (Tur Abidin)
Ortaçağ Dönemi Kültür Varlıkları Yüzey Araştırması

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Ankara 2019

41. ULUSLARARASI KAZI, ARAŞTIRMA VE ARKEOMETRİ SEMPOZYUMU BİLİM KURULU

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ULUSLARARASI KAZI, ARAŞTIRMA VE ARKEOMETRİ SEMPOZYUMU YAYIN KURALLARI

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The papers presented in the International Symposium of Excavations, Surveys and Archaeometry will be published as before.

In order to complete a high-quality print in time, we kindly request you to send the paper texts in the format specified below:

1. Texts should be written in 10 pages on A4 paper, with Times New Roman and 10 type size within a space of 13.5x19 cm. Line spacing should be 10 points.
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3. Footnotes should be placed at the bottom of the pages, with their numbers indicated in the text. Footnote texts should be written with 8 type size and line space of 8 points.
4. Book and periodical titles in the footnotes and bibliography should be written in italics.
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As sudden accumulation of papers makes it difficult to complete printing in time, papers should either be submitted during the symposium or sent to *yayinlar@ktb.gov.tr* until the 1st of August.

The papers that fail to comply with those instructions or that are sent after the deadline will not be published on no account.

İÇİNDEKİLER

WALL PAINTING RESTORATION AND CONSERVATION IN THE NEW CHURCH OF TOKALI IN GOREME'S OPEN AIR MUSEUM

Maria ANDALORO*
Murat E. GULYAZ
Paola POGLIANI
Hatice TEMUR

I- RESTORATION OF THE WALL PAINTINGS OF THE NEW CHURCH OF TOKALI

The restoration of the wall paintings of the New Church of Tokali (fig. 1-2) is part of the project *Wall Paintings in Cappadocia: A Knowledge, Conservation and Development Project*[1] directed by the University of Tuscia since 2006.

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Paola POGLIANI, Assistant Professor in the field of Museology and restoration criticism of the Tuscia University, Viterbo - ITALY.
Hatice TEMUR, Director of Nevşehir Restorasyon ve Konservasyon Bölge Laboratuvarı. Nevşehir/TÜRKİYE.

1 This research mission is part of a larger project entitled *"For a data bank of wall paintings and mosaics of Asia Minor (4th-15th centuries): images, materials, techniques of execution."* The project was divided into two phases. The first one was conducted in Turkey, on the island of *Kűçűk Tavşan Adası* and at many other sites in the territory of the gulf of Mandalya. See: M. Andaloro, *Kűçűk Tavşan Adası Final Report 1996-2005,* (Cannakale, 24 May – 2 June 2006), Ankara 2007, pp. 1-14. The second phase took place in Cappadocia. See with previous bibliography: M. Andaloro, *The new Tokalı Kilise, or the* Sistine Chapel *of Cappadocia,* C. Bordino, *A land dwelt by God. The development of Christian Church in the region of Nevşehir (IV- XIII centuries) and its role in visual arts*, P. Pogliani, *The valorisation of the rock churches of Cappadocia through the restoration*, in 1. Uluslararasi Nevşehir Tarih Ve Kültür Sempozyumu (Nevşehir Üniversitesi, 16-19 Kasım 2011). Nevşehir Üniversitesi, 16-19 November 2011, Nevşehir 2012, vol. 5, pp. 5-26, vol. 2, pp. 161-184, vol. 6, pp. 289-302; and the following more recent international Symposium: M. Andaloro, G. Bordi, C. Bordino, P. Pogliani, V. Valentini, *Signs on the rock. Red paintings in the valleys of Göreme and Kılıçlar*, in *Hypogea 2017.* Proceedings of the International Congress of Speleology in Artificial Cavities (Cappadocia, 6-10 March 2017), ed. by M. Parise, C. Galeazzi, C. Bixio, A. Yamac, Nevşehir 2017, pp. 11-19; M. Andaloro, P. Pogliani, V. Valentini, *Painting on rock settlements in Cappadocia. A database and a virtual museum for the enhancement of the area,* in *Hypogea 2017.* Proceedings of the International Congress of Speleology in Artificial Cavities (Cappadocia, 6/10 March 2017), ed. by M. Parise, C. Galeazzi, C. Bixio, A. Yamac, Nevşehir 2017, pp. 493-502; M. Andaloro, *Kayalık Kapadokya'da resim "üretimi"/La "produzione" di pitture nella Cappadocia rupestre*, in "Arkeoloji ve Sanat", 154 (2017), pp. 121-134; M. Benucci, G. Romagnoli, *Bizans Dönemi Kapadokyası'nda Ekonomi ve Üretim Faaliyetleri. Şahinefendi (Nevşehir) Araştırma Çalışmalarından Bazı Veriler / Economy and production activities in the Byzantine Cappadocia. Some data from the survey of Sahinefendi (Nevsehir)*, in "Arkeoloji ve Sanat", 154 (2017), pp. 188-189; M. Benucci, M.

The project led to the creation, within the scope of the survey conducted in the province of Nevşehir, of the virtual museum and database "Arte e Habitat rupestre" which contains the data and images of hundreds of rupestrian churches[2].

It collects the results of most of the researches conducted on various aspects of the rupestrian habitat: the architecture of the religious and secular monumental complexes, the liturgical furnishings and the pictorial decoration.

The painting decoration, in particular, is the privileged subject of our research involved to the knowledge and comprehension the extraordinary pictorial heritage of the region in order to then plan its conservation.

The research on the Cappadocia paintings seeks to understand the evolution of the rupestrian painting from its origins - VIth century- up to the 13th century, paying particular attention to some phases of this long journey. The research in fact aims to explore the beginnings of rupestrian painting in Cappadocia, which partly coincides with the dispute and destruction of sacred images in the land of Byzantium, with the basic objective of defining if it started before the iconoclastic era (13th century) and what characteristics it assumed in that phase. These questions have been highly debated by critics in the last and present century, but they still divide scholars with oppo-

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Carpiceci, F. Colonnese, C. Inglese, G. Romagnoli, *The rock-cut settlement and the courtyard complex of Şahinefendi (Nevşehir, Turkey)*, in *Hypogea 2017. Proceedings of International Congress of Speleology in artificial cavities (Göreme, 6-8 March 2017),* edited by M. Parise, C. Galeazzi, R. Bixio, A. Yamaç, Rome 2017, pp. 251-260; M. Benucci, C. Crescenzi, C. Giustiniani, G. Romagnoli, *Survey on a monastic complex in the area of Göreme (Nevsehir, Turkey)*, in *Hypogea 2017. Proceedings of the International Congress of Speleology in artificial cavities (Göreme, 6-8 March 2017),* edited by M. Parise, C. Galeazzi, R. Bixio, A. Yamaç, Rome 2017, pp. 404-412; M. Benucci, G. Romagnoli, *Bizans Dönemi Kapadokyası'nda Ekonomi ve Üretim Faaliyetleri. Şahinefendi (Nevşehir) Araştırma Çalışmalarından Bazı Veriler / Economy and production activities in Byzantine Cappadocia. Data from the Şahinefendi survey (Nevsehir)*, "Arkeoloji ve Sanat", 154 (2017), pp. 188-189; Bixio A., Bixio R., De Pascale A., Traverso M., 2017, *The concentric refuge of Kılıçlar Kilisesi (Göreme - Cappadocia)*, Proceedings of the International Congress in Artificial Cavities 'Hypogea 2017, Cappadocia (Turkey), 6-8 March 2017, pp. 313-326; Bixio A., Bixio R., De Pascale A., 2017, *The rock-cut sites in the basin of Şahinefendi (Ürgüp - Cappadocia)*, Proceedings of the International Congress in Artificial Cavities 'Hypogea 2017', Cappadocia (Turkey), 6-8 March 2017, pp. 261-275; Bixio A., Bixio R., De Pascale A., Maifredi A., Traverso M., 2017, *Rock-cut hydraulics in Cappadocia: the tunnel-cisterns of Göreme,* Proceedings of the International Congress in Artificial Cavities 'Hypogea 2017', Cappadocia (Turkey), 6-8 March 2017, pp. 151-164; M.R. Menna, *İmparator Nikeforos Fokas Zamanında Toprağı İşlemek / Cultivating the land in Cappadocia in the age of Emperor Nikephoros Phokas*, in "Arkeoloji ve Sanat", 154 (2017), pp. 186-187.

2 Andaloro M., Valentini V., *La Banca Dati Cappadocia - Arte e Habitat rupestre. Dai corpora cartacei alle applicazioni web*, in *CARE (Corpus architecturae religiosae Europae, IV-X saec.) - Meaning and Use of Corpora,* 24th Annual International Scientific Symposium of IRCLAMA, edited by M. Jurkovic, "Hortus Artium Medievalium", 24, 2018, pp. 74-79.

sing positions[3]. Additional in-depth analyses also concern pictorial evidence from the 10th and 13th centuries[4]. The historical-artistic investigations were completed with a series of studies and actions aimed at understanding the monuments and their context: mapping the stratigraphy of the paintings, topographical surveys, geological surveys, photographic campaigns and the creation of 3D models (fig.3)[5].

The study of the paintings was carried out alongside two important initiatives for the conservation and restoration of two highly significant pictorial contexts. They are the paintings in the Church of the Forty Martyrs in Şahinefendi and in the Church New Tokalı church.

The restoration was completed in 2013; it assumed the value of a pilot site from a methodological perspective and concerned the complex of paintings in the Church of the Forty Martyrs in Şahinefendi (figg. 4-5)[6]. The church features an extensive figurative cycle which develops in both aisles of the building. Before the intervention, the legibility of the paintings was profoundly compromised by a veil of lampblack deposited on the painted surface, and there were lacunas, abrasions and graffiti in Greek and Turkish everywhere. The restoration enabled us to increase our knowledge about pictorial decoration. It was also an opportunity to establish a close association between the different investigation plans and to proceed with the integration of iconographic and stylistic studies, with research into the techniques and materials.

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3 M. Andaloro, *La chiesa di Haghios Basilios e la pittura delle origini in Cappadocia. Linee di un progetto*, ivi, pp. 215-227; G. Bordi, *Palinsesti pittorici*, ivi, pp. 229-238; C. Bordino, *Fonti e iscrizioni*, ivi, pp. 239-256; P. Pogliani, *Materiali e stesure pittoriche*, ivi, pp. 257-264.

4 C. Bordino, *La chiesa di sant'Eustachio a Göreme e la sua decorazione pittorica attraverso il database "Cappadocia. Arte e habitat rupestre"*, in *CARE (Corpus architecturae religiosae Europae, IV-X saec.) - Meaning and Use of Corpora,* 24th Annual International Scientific Symposium of IRCLAMA, edited by M. Jurkovic, "Hortus Artium Medievalium", 24, 2018, pp. 80-89; M. Andaloro, Il progetto dell'Università della Tuscia sulla Cappadocia rupestre alla luce della Chiesa di El Nazar a Göreme, in *Di Bisanzio dirai ciò che è passato, ciò che passa e che sarà. Scritti in onore di Alessandra Guiglia*, edited by A. Paribeni and S. Pedone, Rome, Bardi edizioni, 2018, pp. 97-111; G. Bordi, *El Nazar a Göreme. Sulle tracce delle chiese delle origini In Cappadocia,* ivi, pp. 113-128; C. Bordino, *El Nazar a Göreme. Una rara rappresentazione pittorica di Longino Martire di Cappadocia*, ivi, pp. 129-147.

5 M. Andaloro, *Lo spazio del culto nelle chiese rupestri della Cappadocia,* in «Arkeoloji ve sanat», 148, Istanbul 2015. See also: Colonnese, Fabio; Carpiceci, Marco; Inglese, Carlo. Conveying Cappadocia. *A new representation model for rock-cave architecture by contour lines and chromatic codes*. VIRTUAL ARCHAEOLOGY, 714/2016. pp. 13-19; Crescenzi, C.; Scalzo, M.; Verdiani, G. (2016). 3D Laser Recording and the "Naturalised" Urban Landscape of Göreme, Kapadokya, Turkey. In: LAC 2014, Rome, CLUE+ Research Institute for Culture, Cognition, History and Heritage, pp. 1-11.

6 M. Restle, *Byzantine Wall-Painting in Asia Minor,* Greenwich-Conn 1967, I, 64-65, 158-160, III, 414-432; N. Thierry, *La Cappadoce de l'antiquité au moyen âge*, Turnhout 2002, fiche 49B; C. Jolivet-Lévy, *La Cappadoce un siècle après Guillaume De Jerphanion,* avec la collaboration de Nicole Lemaigre Demesnil, Paris 2015, pp. 218- 220.

The work carried out on the scaffolding of the Church of the Forty Martyrs in Şahinefendi allowed us to identify some unknown layers of the complex pictorial palimpsest of the church by combining a close autopsic observation of the surfaces with the results of the analysis on the constituent materials and the study of the techniques. Four layers correspond to four phases that can be dated to between the proto-Byzantine period and the 13th century[7].

The second restoration worksite has been active since 2011 in the New Tokalı church and is still ongoing (fig. 6-7)[8]. The New Church decoration represents the highest level of painting achieved in Cappadocia, and the monument is one of the best-known and most visited in the entire region[9]. The conservation-restoration project was directed in cooperation with Murat Gulyaz, Director of the Nevşehir Archaeological Museum, and the team of the Regional Restoration Laboratory of Nevşehir[10].

In the past the first restoration sites that brought this kind of experience to Turkey were active in the churches of Tokalı and Karanlik in the Open Air Museum of Göreme. In particular, in 1973 restoration work started on the paintings of the church of Tokalı. We owe this project to Giorgio Torraca, a chemist who at that time was deputy director of ICCROM (the international intergovernmental organization created by UNESCO for the conservation of Cultural Heritage) and Paolo Mora, chief restorer of the Central Institute of

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7 M. Andaloro, S. Borghini, *The restoration of the Church of the Forty Martyrs in Şahinefendi in Cappadocia. 2009 campaign*, in 26. Arkeometri Sonuçları Toplantısı (Istanbul, 24-28 Mayıs 2010), Ankara 2011, pp. 147-160; F. Açıkgöz, L. Alberti, M. Andaloro, C. Caldi, G. Dikilitaş, P. Pogliani, V. Valentini, U. Yalçınkaya, *Kayalık Kapadokya'daki Resimli Süslemelerin Restorasyon Çalışmaları / The restoration of the rock hewn paintings in Cappadocia*, in "Arkeoloji ve Sanat", 154 (2017), pp. 190-191.

8 M. Andaloro, The Project on the rock paintings in Cappadocia (2012). Research and preservation: 1. *the Göreme Open Air Museum; 2. the church of the Forty Martyrs in Şahinefendi*, in *XXXVI International Symposium of Excavations, Survey and Archaeometry* (Muğla, 27-31 May 2013), Ankara 2014, pp. 120-135.

9 Wharton Epstein A., Tokalı Kilise. Tenth-century metropolitan art in Byzantine Cappadocia, Washington DC 1986; M. Andaloro, *Yeni Tokalı Kilisesi: Bir Diğer Tabir ile Kapadokya'nın Sistin Şapeli* / The New Tokalı kilise, or the Sistine Chapel of Cappadocia, in *1. Uluslararasi Nevşehir Tarih Ve Kültür Sempozyumu* (Nevşehir Üniversitesi, 16-19 Kasım 2011), Nevşehir 2012, vol. 5, pp. 5-26; C. Jolivet-Lévy, Tokali Kilise Revisited: New Considerations on Christ's Ministry in the New Church, in 1. Uluslararasi Nevşehir Tarih Ve Kültür Sempozyumu (Nevşehir Üniversitesi, 16-19 Kasım 2011), Nevşehir 2012, vol. 6, p. 289-302.

10 M. Andaloro, *Kapadokya kaya kiliselerinin tanınması, korunması ve kiliselere değer kazandırılması projesi / Per la conoscenza, la conservazione e la valorizzazione delle chiese rupestri della Cappadocia*, in *Turchia e Italia. Orizzonti archeologici*, in «Arkeoloji ve Sanat», 139 (2012), pp. 163-177; F. Açıkgöz, L. Alberti, M. Andaloro, C. Caldi, G. Dikilitaş, P. Pogliani, V. Valentini, U. Yalçınkaya, *Kayalık Kapadokya'daki Resimli Süslemelerin Restorasyon Çalışmaları / The restoration of the rock hewn paintings in Cappadocia*, in "Arkeoloji ve Sanat", 154 (2017), pp. 190-191.

Restoration in Rome (ICR). They were both involved in the UNESCO international mission that laid the foundations for the recovery of the monuments of the Göreme valley as part of the process that led to the inclusion of rocky Cappadocia on the list of World Heritage Sites in 1985[11]. According to the theoretical and methodological vision of Italian restoration, the project involved joint activities aimed at studying the paintings in terms of the execution techniques and materials, the photographic and graphic documentation of the state of conservation, and use of the methods and materials considered the most suitable for consolidating and cleaning the delicate pictorial texts of Tokalı. In Cappadocia, this overall approach then became standard practice in subsequent restoration sites, for example in the churches of Karanlık, Elmalı, El Nazar and Saklı in the Open Air Museum of Göreme[12].

After more than forty years, new restoration work was necessary due to the state of conservation of the paintings. The high percentage of colour lost before the Seventies, evidenced by work to reintegrate the lacunas observed on the surface, is proof of the fragility of the pictorial layer since ancient times; the concentration of these losses in the top part of the wall also suggests the presence of more markedly aggressive microclimatic conditions in the upper part of the church.

The main problem of conservation, found to be rather widespread on the entire surface of the painting, but with areas of greater concentration on some colours, is the detachment of the pictorial layer in flakes. This phenomenon seems to follow the form of the fine craquelure affecting the colour layer with greater or lesser severity, above all along the edges of the existing lacunas. In correspondence to the most recent lacunas, the slight de-cohesion of the support mortar can also be noted.

On the painted surface several scratches and abrasions can also be seen and below, above all along the band at the height of the arches, there are numerous graffiti inscriptions with names and dates.

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11 Pogliani P., Restorasyon Çalışmaları Aracılığı ile Kapadokya Kayalı kiliserenine Diğer Kazandırma Çalışmaları / The improvement of the rock churches of Cappadocia through the restoration, 1. Uluslararasi Nevşehir Tarih Ve Kültür Sempozyumu, Nevşehir Üniversitesi, 16-19 Kasım 2011, Nevşehir 2012, vol. 6, p. 289-302.

12 R. Ozil, The objectives of the International mural painting conservation project (Göreme, 1973-1990), in The Safeguard of the Rock-Hewn Churches of the Göreme Valley, Rome 1995, pp. 163-170.

A heavy layer of atmospheric deposits covers the entire surface and accumulates to a considerable thickness along all the horizontal surfaces and the deformed surfaces that jut out.

The state of conservation of the pictorial layer is in part due to the technical-material characteristics of these paintings. The New Church decoration certainly represents a unique example and at the same time the height of pictorial production in Cappadocia in terms of its iconographic complexity, stylistic quality, unique technical execution processes and the use of pictorial materials of rare magnificence. They had access to high quality precious materials and in considerable quantities – ultramarine blue obtained by processing from lapis lazuli, gold and silver leaf – which they used to paint the surfaces of the entire architectural cave using the *secco* technique.

The meticulous cleaning of the paintings restored vigour to the lapis blue backgrounds and the pictorial layer thereby making extraordinary details legible once again, such as the gold leaf used to fill in the halos or the gold leaf used as highlights in Christ's robes.

The more strictly static problems seem to be minor and do not represent an imminent danger. Moreover, the phenomenon of detachment from the plaster does not appear to be particularly extensive or severe, also due to the fact that a successful deep-seated consolidation was carried out during the previous intervention.

The restoration of the paintings of the New Church of Tokali was organised inside the church according to architectural units:

2011-2014 north wall

2013-2015 dome of the central apse and dome of the north apse

2016-2018 corridor (vault and soffits).

The restoration campaign lasted for an average of 4 weeks each year and involved the participation of Turkish and Italian restorers.

The methodology and results of the last campaigns are described below.

II- RESTORATION OF THE PAINTINGS IN THE CORRIDOR (2016-2018 CAMPAIGNS)

Fazil Açilgöz, Livia Alberti, Merve Azize Işin, Cristina Caldi, Sara Scioscia, Maria Cristina Tomassetti, Uğur Yalçinkaya.

Coordinator of the restoration: Livia Alberti

State of conservation of the pictorial decoration of the corridor

The rocky support has numerous cracks essentially running parallel which, starting at the side of the apses, diagonally cross the corridor and the arched wall between it and the naos.

These are through cracks that, most likely following uneven planes in the body of the bluff, run along the rock face with a slightly oblique, almost vertical course (up towards the north – down towards the south) and are the origin of the lacunas in the sculpted architecture found on the north side of soffit II, and on the south side soffit V. Both of these lacunas continue for significant sections into the pillars below. This series of cracks is also part of the significant fissure found on the north side of the church, on the wall that separates the naos from the parecclesion room.

In the case of the crack in the second arch, above the lacuna of the pillar (fig. 8), on the surface of the soffit there is a fine crack which completely crosses the arch diagonally (from the edge of the lacuna: 50 cm on the left side and 75 cm on the right side) and then continues on the adjacent walls (west wall of the corridor and east wall of the naos) for about 10-15 cm to then disappear beneath the painted plaster in the direction of the main fissure travelling in a vertical direction.

While the main fissure corresponds to a natural vein in the stone, the horizontal crack under the arch occurred due to static instability, perhaps when the section below the pillar collapsed or perhaps even more recently due to the lack of a support where the weight can be discharged, perhaps prompted by telluric events or other vibrations from the ground.

The available data has not enabled us to establish whether the fracture in the portion of rock is complete and therefore if the fragment is detached but held in place due to mechanical adhesions, nor was it possible to know how long this equilibrium has existed. The fragment in question is approximately 80 cm wide (the width of the arch), an average of 60 cm high from the outer side and approximately 1 m from the inner side. Its thickness ranges from 10 cm at the base to 40 cm in the top parts (inner side of the corridor, but greater from the top of the naos), covering an approximate volume of 0.30 – 0.40 m^3 and having a conceivable weight of approximately 550 – 600 kg (specific weight of tuff approximately 1800kg/m^3).

The inner surface of the pillar adjacent to the south wall (soffit ED IV) presents widespread scaling and exfoliation, which can probably be related

to the very nature of the bedrock, which is particularly deteriorated on the south wall.

The central part of the corridor still conserves an extended surface of painted plaster in the top sections. The ceiling is practically intact, while lacuna of different widths affect the east and west vertical walls of the corridor and soffits: a large part of the area below and to the right of the Transfiguration scene (E III 2c), the lower half of both sides of the soffit between the apse and the corridor (EG 2d, 2f), one third of the lower part of both sides of the fourth soffit bordering with the naos (ED IV 2a, 2b) and, with surfaces of different widths, the lower part of the west wall between the arches (E I 2b, 2d, 2f) are missing.

The small lacunas caused by mechanical action are very rare; however, scratches made by a sharp instrument can be seen on the west wall of the corridor between arches IV and V and on both sides of the central soffit between the naos and the corridor. There are numerous inscriptions engraved into the plaster conserved in the lower parts of the third and fourth soffits, on the left side of the soffit of the apse and on the surface between the second and third arch of the west wall; the inscriptions are in different languages and bear some dates.

There are several areas where the plaster is detached from the masonry, above all in correspondence to the fissures, but only in a few cases, all located along the edges of the lacunas, do they represent a real reason for the loss.

Despite work to reattach individual flakes of colour that had lifted off, carried out as swift intervention work during the last restoration site, the main conservation problem is the fragility of the colour layer (fig. 10-11). The pictorial layer is in fact fragmented in many places and not very well attached to the support, especially in the case of some colours that most likely have an organic binder such as browns and purple, and many flesh tones.

The bright red finish of the robes of the soffits, apparently a lacquer, shows a very fine crack in the limited areas where it is conserved.

These phenomena are strictly linked to the *secco* technique, as well as the interaction between the constituent materials and the microclimatic factors. The plaster, with the probable strong presence of gypsum, is crumbly on the surface and does not guarantee adhesion, above all of the most cracked colours. Instead greater solidity can be seen in some pictorial layers of light colours, above all white, ochre and grey, which have a delicately preserved

continuous surface for the most part attached to the support.

Most of the lacunas in the pictorial layer, as they have already been retouched, date back to prior to the ICCROM intervention, but numerous more recent lacunas can also be observed.

Only some colours, such as above all the lapis lazuli of the backgrounds and sometimes the red of the cornice bands, instead rather show decohesion, most likely due to a weakness or the deterioration of the binder.

Moreover, some rare light white-grey coats can be observed, which could be the result of the alteration of white lead.

The gold metallic foils on the robes and halo of Christ of the Transfiguration are in a fairly good state of conservation and are well attached to the underlying pictorial layer (fig, 12). The silver foil, on the other hand, conserved only in fragments, has completely oxidized and is at risk of coming away (fig. 13).

Large parts of the blue backgrounds show rather extensive dark marks, the origin of which is not well understood.

The same phenomenon can be seen on the grey backgrounds laid as a preparation for the lapis, where they were not covered by the blue pigment. It is therefore conceivable that these marks were produced at the very level of the preparatory layer.

Restoration work

The work consisted of stabilizing the pictorial layer, cleaning and reintegration.

The actions carried out were performed as follows:

- Reattachment of the flakes of colour with acrylic resin E411 at 3% in acetone and ethyl alcohol (1:1), applied by brush with the interposition of Japanese paper, and removal of adhesive residues from the surface with isopropyl alcohol or acetone azeotrope (88.5% acetone and 11.5% water).

- Cleaning of the pictorial layer and lightening or removal of the ICCROM retouching with water and surfactant (Tween 20 at 0.5%), or with isopropyl alcohol, or with a solvent mixture (Methyl ethyl ketone and Isopropyl Alcohol 1:1), or with acetone azeotrope, applied with a pad or brush.

- Removal of cleaning residues with the application, with water, of Kleenex ply paper left to dry on the surface.

- Removal of dust deposits found on the exposed part of the rocky surface, first using a dry technique with a soft brush and then with water applied with a manual spray and absorbed with a sponge. Where there was red and green decoration applied directly to the stone, in cases where decohesion was found, the work was carried out in a particularly delicate way using just a puff of air from a rubber squeeze bulb or with light water padding.

- Stuccoing of the deepest lacunas and consolidation holes with a mortar composed of lime putty, light-grey local tuff stone powder (1:2).

- Protection of the edges of the unstuccoed lacuna, where necessary, with the same mortar.

- Pictorial reintegration with watercolours (Winsor & Newton) using the tone-lowering technique with the predominant use of black (fig. 14-15).

Above the head of the Christ of the Transfiguration, on the east wall of the corridor, stucco work created during the ICCROM restoration was removed which had closed a deep hole in the rocky support. This hole, in addition to having a slightly square form, shows traces of iron oxide. The hole had been left open as it was probably the seat of an iron element inserted to support a piece of church furniture. Its position, which interrupts the inscription above the head of Christ, suggests it was executed after the pictorial phase of the church.

Considering the severity of the crack affecting the second arch from the north and exploiting the presence of the scaffolding underneath the arch still present for this work campaign, the decision was made to intervene to secure the fractured block. The intervention involved the insertion of 2 dowel rods which, crossing the detached part and entering the main body of the rock, prevent the large fragment from sliding downwards.

The dowel rods, fiberglass rods with a 12 mm diameter, were inserted from the side of the soffit and angled slightly diagonally from top to bottom (fig. 9).

The 2 holes were drilled to different depths in order to intercept the plane of the fracture which runs in a non-parallel course along the surface of the soffit and therefore both enter the sound part of the pillar for approximately 15 cm (25 cm for the right dowel rod and 40 cm the left one). The dowel rods were inserted into the lower part of the fragment, where there is no painting, up to 20 cm from the vertical sides of the arch and 24 cm from the horizontal plane of the fracture. The holes were made with a low-speed electric drill

with no impact. The rods were inserted slightly below the surface of the rock of the soffit and were then stuccoed in a mimetic fashion.

The entire restoration was documented in 25 graphic figures. The figures were produced with coloured markers on a black and white photographic base, A3 format.

Fig. 1: Göreme Open Air Museum, New Church of Tokalı. Exterion view.

Fig. 2: Göreme Open Air Museum, New Church of Tokalı. View from the entrance.

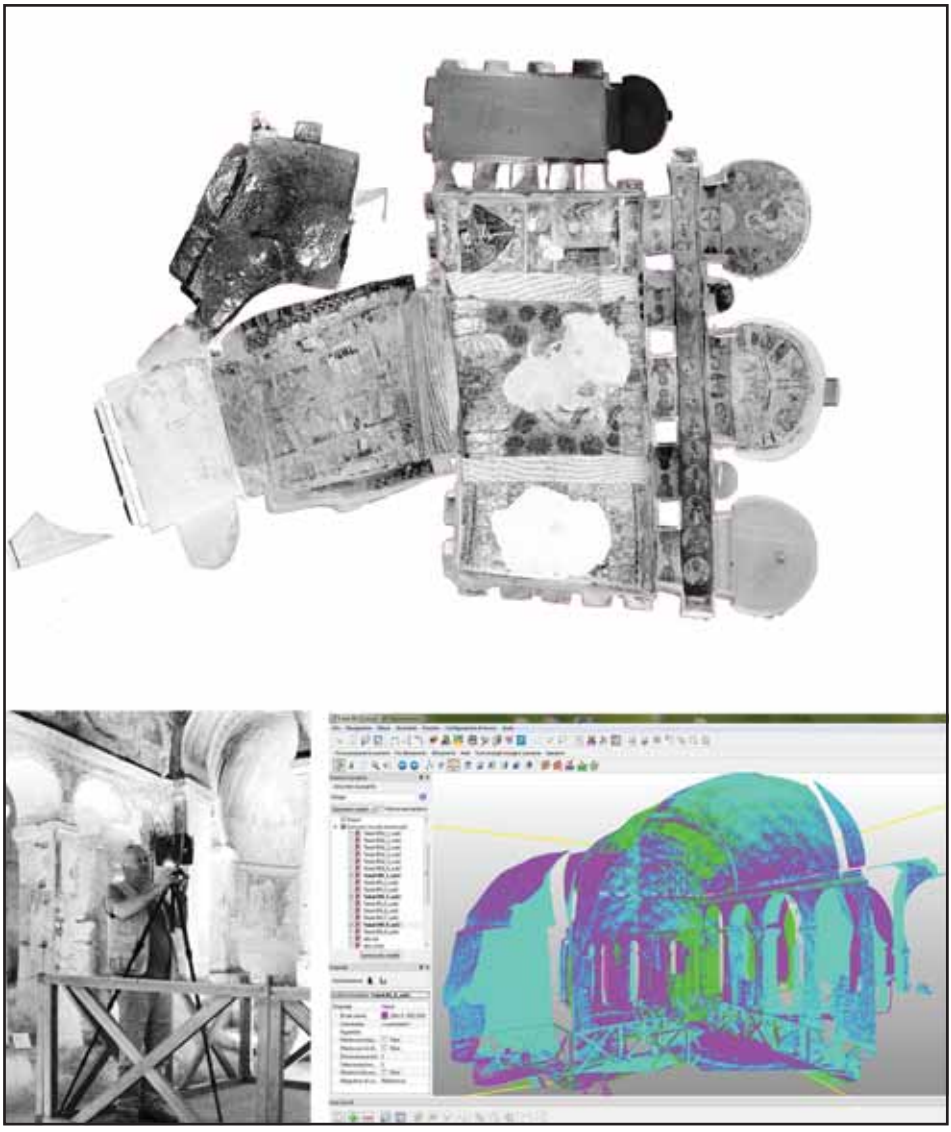

Fig. 3: Göreme Open Air Museum, Church of Tokalı. Relief and planimetry (M. Carpiceci, Sapienza University).

Fig. 4: Şahinefendi, the church of Fourty Martirs, interior. View of the south aisle and south apse before restoration.

Fig. 5: Şahinefendi, the church of Fourty Martirs, interior. View of the south aisle and south apse after restoration.

Fig. 6: Göreme Open Air Museum, New Church of Tokalı. The restoration worksite.

Fig. 7: Göreme Open Air Museum, New Church of Tokalı. The the paintings on the walls and ceiling of the corridor during the restoration.

Fig. 8 Göreme Open Air Museum, New Church of Tokalı. The cracks on therocky support in the second arch above the lacuna of the pillar.

Fig. 9: Göreme Open Air Museum, New Church of Tokalı. Secon pillar, intervention with the insertion of 2 dowel rods.

Fig. 10: Göreme Open Air Museum, New Church of Tokalı. Corridor. Particoular of the state of preservation of the painting layer.

Fig. 11: Göreme Open Air Museum, New Church of Tokalı. Corridor. Particoular of the state of preservation of the painting layer.

Fig. 12: Göreme Open Air Museum, New Church of Tokalı. Corridor, Transfiguration. Particoular of the gold metallic foils on the robes and halo of Christ.

Fig. 13: Göreme Open Air Museum, New Church of Tokalı. Corridor, Transfiguration. Particoular of the silver metallic foils on the robes of Christ.

Fig. 14: Göreme Open Air Museum, New Church of Tokalı. Corridor, St. Nicandro of Myra before the restoration

Fig. 15: Göreme Open Air Museum, New Church of Tokalı. Corridor, St. Nicandro of Myra after the restoration