## **Contents**

"HYPOGEA" The Official Brand of the International Congresses of Speleology in Artificial Cavities  GALEAZZI Carla, PARISE Mario
OPERA IPOGEA Journal of Speleology in Artificial Cavities  DE PASCALE Andrea, SAJ Stefano
ARCHAEOLOGY, ARCHAEOMETRY, ART HISTORY
Signs on the rock. Red paintings in the valleys of Göreme and Kılıçlar (Turkey)  ANDALORO Maria, BORDI Giulia, BORDINO Chiara, POGLIANI Paola, VALENTINI Valeria11
Hypogea with niches of southern Apulia. Examples of rural economy in medieval cave settlements of Salento CALÒ Stefano, SANTUCCI Elettra
Model and experience. Measuring deformations of rupestrian architectures in the area of Göreme  CARPICECI Marco, COLONNESE Fabio, INGLESE Carlo, ANGELINI Andrea
Rock-Cut Façades from Byzantine Cappadocia  KALAS Veronica
Graffiti of Boats from the Hellenistic and Early Roman Period in Underground Chambers in the Judean Foothills, Israel KLEIN Eitan, ZISSU Boaz
If techniques help to date a monument three cases studies  LAMESA Anaïs
A link between "ancient words" and the "underground world": Cappadocian landscape, rock-cut structures and textual evidence from Hittite documentation  MORA Clelia, BALZA Maria Elena, BIXIO Roberto, DE PASCALE Andrea
Image-Based Modeling Techniques for Visualization and Analyses of Cave Dwellings  *POLIMENI Beniamino**  79
Hiding Complexes in the Galilee, Israel: artificial refuges caves in the Early Roman Period  SHIVTIEL Yinon
GEOLOGY, GEOMORPHOLOGY, ENVIRONMENTAL HAZARDS
Paleontological and physico-chemical methods for identification of limestone as a construction stone  ALBOV Dmitry, ISAKOVA T.N., YANOVSKAIA E.G
Historical research and geological-structural stability problems in artificial cavities of Marche  CAMPAGNOLI Marco
The consequence of erosion caused by watercourses on the conservation of cavities hollowed in the soft sedimentary stratus in Cappadocia  **COUPRIE Pierre**
Cave Settlements in Volcanic Areas of the Armenian Republic  DAVTYAN Smbat
A project to promote the importance of the natural and cultural heritage of the underground environment in southern Italy LAPENNA Vincenzo, LEUCCI Gianni, PARISE Mario, PORFYRIOU Heleni, GENOVESE Laura, VARRIALE Roberta 129

Engineering-geological studies on artificial cavities, aimed et evaluating the possibility of failures in underground settings  PARISE Mario
Carbonate deposits in artificial galleries: chronology and past-environmental reconstruction. Case studies of Versailles Palace and Northern Paris underground aqueducts (France)  PONS-BRANCHU Edwige, ROY-BARMAN Matthieu, DUMONT Emmanuel, DUSERRE Gérard, LARGIER Jean-Luc,  GUILLERME André, FERNANDEZ Mathieu, BULTEZ Gilles, MALNAR Daniella, FOLIOT Lorna, THIL François,  DAPOIGNY Arnaud, DOUVILLE Eric, BRANCHU Philippe, PETILLON Gaelle, BORDIER Louise
HYDRAULIC UNDERGROUND WORKS
Rock-cut hydraulics in Cappadocia: the tunnel-cisterns of Göreme  BIXIO Andrea, BIXIO Roberto, DE PASCALE Andrea, MAIFREDI Alessandro, TRAVERSO Mauro151
The culverted streams in the historical amphitheatre of Genoa city (Italy): flood risk or geoheritage protection?  BIXIO Roberto, FACCINI Francesco, MAIFREDI Alessandro, PERASSO Luigi, SAJ Stefano, TRAVERSO Mauro165
Challenges and conflicts in preserving traditional underground water channels (qanāt/kārīz)  CANAVAS Constantin177
Background history on the presence of an underground snow-house in Potenza Picena (Marche, Italy)  **CARESTIA Luca****  183
A study of an underground Medieval Water Distribution Network and other structures in a Spanish town  CARRIÓN Andrés, FORNES Antonio, SISTERNAS Alberto, BENEDITO Vicente, ROMERO José
Hellenistic-Roman underground water systems: The case of Ma'abarta - Flavia Neapolis, southern Levant  FRUMKIN Amos
Artificial Outlets: analysis of the drainage-related functions during planning. Integrated systems?  GERMANI Carlo, GALEAZZI Carla, GALEAZZI Sandro
Underground areas of the Villa Farnese in Caprarola (Viterbo, Italy)  GERMANI Carlo, MAZZOLI Mario, GALEAZZI Sandro, VITELLI Marco215
Preliminary Report on the Rock-Cut and Underground Cisterns of Medieval and Post-medieval Messinia  GERMANIDOU Sophia
Underground hydraulic works related to artificial crop areas in Cappadocia  GILLI Eric
Tank of the Roman Villa in Tor Vergata (Rome, Italy) PELLANDRA Davide Ivan, MAZZOLI Mario
Dating and Understanding the Underground Water Structure in Gaziantep based on Şeriye Records and Charter of Wakfs  UÇAR Meltem
Underground Hydraulic Structures of Gaziantep (Southeast Turkey): Livas and Qastels  YAMAC Ali, OKUDUCU Zafer
HYPOGEAN CIVILIAN DWELLINGS
The rock-cut settlement and the courtyard complex of Şahinefendi (Nevşehir, Turkey)  BENUCCI Michele, CARPICECI Marco, COLONNESE Fabio, INGLESE Carlo, ROMAGNOLI Giuseppe251
The Rock-cut sites in the basin of Şahinefendi (Ürgüp - Cappadocia)  BIXIO Andrea, BIXIO Roberto, DE PASCALE Andrea
Rock shelters of the Upper Turia Valley (Spain). A testimony of a lost society  CARRIÓN-GARCÍA Andrés, FORNES Antonio, SISTERNAS Alberto, BENEDITO Vicente, CARRIÓN-BAZ Andrés275

The rock-cut settlement of Karlık (Central Turkey). Speleological investigations  GALEAZZI Carla, GERMANI Carlo	. 282
Caves settlements in Peristrema (Ihlara) Valley, Turkey  LEONTEV Mikhail, IANOVSKAIA Ekaterina	290
Rock-cut dwellings in Syunik, Armenia SHAHINYAN Samvel, DAVTYAN Smbat, ALEKSANYAN Taron, YENOKYAN Vruyr, ASRABYAN Areg, NAHAPETYAN Davit, KHUDOYAN Anush	294
Cave dwellings of Euphrates River (Southeast Turkey)  YAMAC Ali	298
Kırkmerdiven Underground City of Doganli Village, Kayseri (Southeast Turkey)  YAMAC Ali	302
Underground Settlements and Cave Dwellings of Agirnas Village, Kayseri (Southeast Turkey)  YAMAC Ali	306
MILITARY AND DEFENSIVE WORKS	
The concentric refuge of Kılıçlar Kilisesi complex (Göreme - Cappadocia)  BIXIO Andrea, BIXIO Roberto, DE PASCALE Andrea, TRAVERSO Mauro	313
Common Traits of Artificial Caves and Rock-Cut Constructions in Ancient Armenia  BOBOKHYAN Arsen, DAVTYAN Smbat	327
Underground Herodium: Guerrilla Warfare during the Bar Kokhba War (132–136 CE) under Herod's Royal Palace Fortro PORAT Roi, KALMAN Ya'akov, CHACHY Rachel, ZISSU Boaz	
MINING WORKS	
The rediscovery of the Formignano Sulphur Mine (Forli-Cesena, Italy)  BELVEDERI Giovanni, ERCOLANI Massimo, GARBERI Maria Luisa, GONNELLA Sabrina, PERUZZI Fabio, ROSSI  Giovanni, SANSAVINI Baldo	351
The redevelopment of abandoned underground mines to mining museum and hypogeum walkway: a case from Gambates Mine, Aveto Natural Park (Italy)  BENEDETTINI A., CABELLA R., CHIAPPINO C., CRESTA P., FACCINI F., ROBBIANO A., STUPPINI M	
Holodna Balka Quarry Research (Ukraine)  GREK Igor O., SHIROKOV M.N.	
The Latomie of Ragusa (Sicily, southern Italy): a case study of artificial cavities in the underground of the city RUGGIERI Rosario	368
Underground Quarries of Gaziantep (Southeast Turkey)  YAMAC Ali	374
RELIGIOUS - CULT STRUCTURES	
The use of natural caves in the Christian religious practise in the Karoulia (Mount Athos, Greece)  AGAPOV Ilya	381
Typological and Chronological Problems of David-Gareji (Georgia) Cave Churches Against the Background of Cappado Rock-cut Monuments  BAKHTADZE Nodar, GABEKHADZE Bachana, MAMIASHVILI Vazha	
Survey on a monastic complex in the area of Göreme (Nevşehir, Turkey)  BENUCCI Michele, CRESCENZI Carmela, GIUSTINIANI Claudio, ROMAGNOLI Giuseppe	

Catacombs of Kerch (Ukraine)  BYTRITSKAYA D.D., GREK Igor O
Exploration and researches in the Holy Cave of Altura (Castellón Spain)
$CARRI\'ON\ Andr\'es, FORNES\ Antonio, SISTERNAS\ Alberto,\ BENEDITO\ Vicente, FERNANDEZ\ Jos\'e, BARCIELA\ Virginia\\ 416$
The expeditious survey of Tokalı Kilise in Soğanlı Valley (Turkey)  CRESCENZI Carmela, FIRENZUOLI Virginia, SALVADORI Chiara, VANNACCI Elena
Negotiating Above and Underground Sacredness in Nineteenth-Century Cappadocia: The Use of Underground Cities  DE TAPIA Ayde Aylin
People behind Places. The Role and value of the hermitages of San Michele in the settlement of Colli Albani (Latium, Italy) during the Middle Ages  GIANNINI Nicoletta
From columbaria to dovecotes: two thousand years of use of cave dwellings in Ağırnas (Kayseri, Turkey)  GILLI Eric
Gülşehir- Karşı Kilise (a 13 <sup>th</sup> century church in Cappadocia, Central Turkey)  GÖKCAN F. Sema
Artificial caves in chalk outcrops in the Don basin  GUNKO Alexey, KONDRATYEVA Sofia, STEPKIN Vitaliy
Cave temples in the Don region, Russia and Ukraine  GUNKO Alexey, STEPKIN Vitaliy, KONDRATYEVA Sofia
Hypogean structures under the jurisdiction of the monastery of St. Silvestro in Capite between 10 and 13th century, in the Viterbo area, central Italy  PASTURA Giancarlo
Caves in Italo-Greek Medieval monasticism. New explorations and cultural function  ZAGARI Francesca
TYPOLOGIES, SYMBOLS, TERMS AND CADASTRE OF ARTIFICIAL CAVITIES
Painting on rock settlements in Cappadocia. A database and a virtual museum for the enhancement of the area ANDALORO Maria, VALENTINI Valeria, POGLIANI Paola
From Karalis to Cagliari (Sardinia, Italy). A three thousand years journey inside the artificial cavities of the city  CILLA Cristiana, CONTU Marco, FADDA Jessica, MASCIA Riccardo, MATTANA Marco, MEREU Lucio, MURA Lucia,  SANNA Roberto, SCANU Alice
Rock-cut roads in the Middle Ages: reuse, new elements and "service" roads  DE MINICIS Elisabetta
Principles of speleostological zoning  DOLOTOV Yuri
20 centuries of excavation in Laon (France)  MONTAGNE Denis
The anthropogenic caves in Finalese (northern Italy) during historical age  MORDEGLIA Simona
Southern Italy underground space: from the history to the future  VARRIALE Roberta
AUTHORS INDEX556