



Cultural Heritage Microbiology

**Fundamental Studies in
Conservation Science**

RALPH MITCHELL & CHRISTOPHER J. McNAMARA, Editors

Heritage Microbiology And Science Heritage Microbiology And Science

Daniela Pinna



Heritage Microbiology And Science Heritage Microbiology And Science:

Heritage Microbiology and Science Eric May, Mark Jones, Julian Mitchell, 2008-09-17 Heritage Science is emerging as a discipline that brings together chemists, physicists, microbiologists, conservation scientists, archaeologists and conservators. Its scope, precise boundaries and the interfaces between its component disciplines may be in a state of flux, but above all its interdisciplinary nature offers understanding of the causes, control and protection of heritage from ever-present environmental challenges. In particular, the activities of microbes play a central part in shaping the natural world of our planet, but this awesome power constitutes a serious threat to the integrity of our most precious art heritage artefacts, monuments and cultural treasures. Heritage artefacts that have been recovered from water or that exist near the sea in maritime conditions pose special conservation problems due in main to the combined effect of microbial activities and physical/chemical assaults that the environment can offer. This book is a result of the invited and updated papers from HMS2005 Microbes, Monuments and Maritime Materials and forms a comprehensive volume that addresses key topical areas of heritage science and discusses the threats to a wide range of heritage materials and monuments by biological and chemical agents of decay. Key features of the book include: Up-to-date summaries on the conservation of internationally important artefacts and monuments; Clear outline of molecular techniques to identify microbes in environmental heritage samples; Wide range of case studies covering wood, stone, cave and cave paintings; Contributions presented as fully referenced research publications giving useful technical details and identification of areas for future study; Informs conservators about the threats from microbes to a range of materials; Extensive range of case studies of important world heritage artefacts and monuments as well as an overview of in situ preservation of historic ships; Provides background knowledge on the use and application of modern analytical techniques in conservation; Contains detailed information on molecular and synchrotron techniques to assist with identifying biological and chemical threats to heritage artefacts and monuments; The book also provides up-to-date information on subjects covering the component field of heritage microbiology, molecular and chemical analytical techniques and the mechanisms of degradation and deterioration of historic ships and buildings; The book details state-of-the-art techniques for the study of large and small heritage objects and their conservation; Techniques cover the use of GIS, image processing, molecular biological analysis of environmental samples including FISH, electrophoresis to remove corrosive ions and synchrotron radiation to detect chemicals present in artefacts; Several authors have developed their methods through involvement in international collaborative projects such as BIOBRUSH, BACPOLES and Save the Vasa; Extensive emphasis is placed on case studies and there is a valuable section on historic ships covering the preservation of HMS Victory, ss Great Britain, Vasa and the Mary Rose. This book provides an indispensable guide and reference source for those working in all areas of historical conservation, biodeterioration, microbiology and materials science. Cultural Heritage Microbiology Ralph Mitchell, Christopher J. McNamara, 2010 Ideal for anyone concerned with recognizing and

dealing with microbial deterioration of heritage materials Provides a unique single overview of the seminal literature in conservation microbiology Presents the current state of the art along with a synthesis of the major developments over the years Represents the findings of leading international experts and pioneers in the field Offers conservation scientists and conservators an inclusive view of the heritage conservation field plus extensive resources for further investigation

Science and heritage Great Britain: Parliament: House of Lords: Science and Technology Committee,2007-10-19 This report is an update on developments since the Committee reported in November 2006 HLP 256 9th report session 2005 06 ISBN 9780104009550 and the Government published its response Cm 7031 ISBN 9780101703123 in January 2007 The Committee had recommended an organisational framework whereby the hitherto fragmented heritage sector could come together with university based scientists and funding bodies to develop strategic priorities for heritage science and collaborative projects and research proposals The response at a post publication seminar attended by representatives from the heritage and science communities was overwhelmingly positive The Committee welcomes the progress made in implementing its recommendations but notes that the progress has only come from the heritage sector and research community the Department for Culture Media and Sport has failed to grasp the significance of the Committee s recommendations The Committee urges the new set of ministers at the Department to revisit the original report respond positively and provide moral leadership to the sector *Science, Technology and Cultural Heritage* M.A.

Rogério-Candelera,2014-12-01 The Second International Congress on Science and Technology for the Conservation of Cultural Heritage was held in Seville Spain June 24 27 2014 under the umbrella of the TechnoHeritage network TechnoHeritage is an initiative funded by the Spanish Ministry of Economy and Competitivity dedicated to the creation of a network which integrates CSIC **Microorganisms in the Deterioration and Preservation of Cultural Heritage** Edith

Joseph,2021-05-05 This open access book offers a comprehensive overview of the role and potential of microorganisms in the degradation and preservation of cultural materials e g stone metals graphic documents textiles paintings glass etc Microorganisms are a major cause of deterioration in cultural artefacts both in the case of outdoor monuments and archaeological finds This book covers the microorganisms involved in biodeterioration and control methods used to reduce their impact on cultural artefacts Additionally the reader will learn more about how microorganisms can be used for the preservation and protection of cultural artefacts through bio based and eco friendly materials New avenues for developing methods and materials for the conservation of cultural artefacts are discussed together with concrete advances in terms of sustainability effectiveness and toxicity making the book essential reading for anyone interested in microbiology and the preservation of cultural heritage **Heritage Wood** Austin Nevin,Malgorzata Sawicki,2019-10-12 This volume highlights

recent research efforts in the conservation and investigation of works of art on wood Through eleven case studies it showcases different experimental methods ranging from X ray analysis of objects to the study of cross sections made from

micro samples New research focusing on the technical study treatment and assessment of works of art on wood in its many forms is featured in this edited volume Technical studies include the attribution and investigations of a triptych by Hans Memling and a sculpture from workshop of Michel and Gregor Erhart decorated Syrian rooms and investigations of finely carved Gothic wooden objects Synchrotron based methods are presented for studying the alteration of 19th c verdigris in Norway and multi analytical methods are employed for the investigations of 16th to 19th c East Asian lacquer from the Kunsthistorisches Museum in Vienna Novel methods for the cleaning of gilded surfaces using gels and emulsions are shown as are innovative strategies for the consolidation for waterlogged wood providing key data for the assessment of risks and benefits of new methods and the short and long term effects on gilding layers and archaeological wood The book clearly shows how collaboration between engineers physicists biologists and chemists and conservators of different types of materials can lead to new research in conservation science This book is crucial reading for conservators and conservation scientists as well as for technical art historians providing key methodological case studies of polychromy from different temporal and geographical contexts

The UNESCO Training Manual for the Protection of the Underwater Cultural Heritage in Latin America and the Caribbean Netherlands. Ministry of Education, Culture and Science. Cultural Heritage Agency, UNESCO, 2021-03-10 De Engelstalige UNESCO Training Manual for the Protection and Management of Underwater Cultural Heritage in Latin America and the Caribbean is samen met UNESCO ontwikkeld en vormt de basis voor trainingen in onderwater cultureel erfgoedbeheer in Latijns Amerika en de Cara ben Het is een vervolg op een eerder verschenen trainingsmanual 2012 waarin gefocused werd op Azi en de Pacifische regio uitgever

Science and Technology for the Conservation of Cultural Heritage Miguel Angel Rogerio-Candelera, Massimo Lazzari, Emilio Cano, 2013-10-01 From 2nd to 5th October 2012 an International Congress on Science and Technology for the conservation of Cultural Heritage was held in Santiago de Compostela Spain organized by the Universidade of Santiago de Compostela on behalf of TechnoHeritage Network The congress was attended by some 160 participants from 10 countries which presented a total of 145 contributions among plenary lectures oral and poster communications The congress was dedicated to eight topics namely 1 Environmental assessment and monitoring pollution climate change natural events etc of Cultural Heritage 2 Agents and mechanisms of deterioration of Cultural Heritage physical chemical biological including deterioration of modern materials used in Contemporary Art and information storage 3 Development of new instruments non invasive technologies and innovative solutions for analysis protection and conservation of Cultural Heritage 4 New products and materials for conservation and maintenance of Cultural Heritage 5 Preservation of industrial and rural heritage from the 19th and 20th centuries 6 Security technologies Remote sensing and Geographical Information Systems for protection and management of Cultural Heritage 7 Significance and social value of Cultural Heritage and 8 Policies for conservation of Cultural Heritage This volume publishes a total of ninety three contributions which reflect some of the most recent responses to the challenge of cultural assets

conservation **Corrosion and Conservation of Cultural Heritage Metallic Artefacts** P Dillmann,D Watkinson,E Angelini,A Adriaens,2013-07-31 The conservation of metallic archaeological and historic artefacts is a major challenge whether they are ancient bronzes or relics of our more recent industrial past Based on the work of Working Party 21 Corrosion of Archaeological and Historical Artefacts within the European Federation of Corrosion EFC this important book summarises key recent research on analytical techniques understanding corrosion processes and preventing the corrosion of cultural heritage metallic artefacts After an introductory part on some of the key issues in this area part two reviews the range of analytical techniques for measuring and analysing corrosion processes including time resolved spectroelectrochemistry voltammetry and laser induced breakdown spectroscopy Part three reviews different types of corrosion processes for a range of artefacts whilst part four discusses on site monitoring techniques The final part of the book summaries a range of conservation techniques and strategies to conserve cultural heritage metallic artefacts Corrosion and conservation of cultural heritage metallic artefacts is an important reference for all those involved in archaeology and conservation including governments museums as well as those undertaking research in archaeology and corrosion science Summarises key research on analytical techniques for measuring and analysing corrosion processes Provides detailed understanding of corrosion processes and corrosion prevention Discusses on site monitoring techniques *Corrosion and conservation of cultural heritage metallic artefacts* D. Watkinson,2013-07-31 Relationships between conservation and corrosion scientists are assessed and similarities differences and synergies identified Corrosion control as a preservation option for heritage metals is advocated as being cost effective and pragmatic This will require generation of data to develop predictive conservation and estimation of object lifespan as a function of their intrinsic and extrinsic variables Methods for quantitative determination of corrosion rates of chloride infested heritage iron and techniques for scaling to heritage value are discussed The iron hull of the ss Great Britain and an AHRC EPSRC Heritage Science Research Programme at Cardiff University are used to illustrate the rationale behind using corrosion control in heritage **Heritage** Daniela Turcanu-Carutiu,2020-09-09 This book presents research efforts in the field of heritage According to the principle Open Minds Open Science the approach of the researchers helps us to define establish and affirm heritage in the cultural social and political dimension of today s world based on what we have achieved and be specific to the realities of the 21st century Cultural heritage is made up of many big and small things It is preserved through books artifacts objects images photographs art and oral tradition Sometimes we can touch and see what a culture is other times it is intangible From this point of view this book Heritage is transdisciplinary and contains the most diverse topics related to culture art nature science diplomacy and cultural policy **Corrosion and conservation of cultural heritage metallic artefacts** D. Neff,S. Reguer,P. Dillmann,2013-07-31 This chapter introduces the techniques used when investigating corrosion layers formed on cultural heritage artefacts Various multiscale analysis methods from macroscopic to nanoscopic scales are presented Information on

the morphology the elementary composition and the crystalline structure that each method allows for determining the constituents of the corrosion layers is examined as well as their limits in terms of set up spatial and detection resolution This chapter discusses the characteristics of the scientific tools that can be used to understand corrosion phenomena by taking into account the major parameters responsible for alteration mechanisms **Conservation of Books** Abigail

Bainbridge,2023-03-27 Conservation of Books is the highly anticipated reference work on global book structures and their conservation offering the first modern comprehensive overview on this subject The volume takes an international approach to its subject Written by over 70 specialists in conservation and conservation science based in 19 countries its 26 chapters cover traditional book structures from around the world the materials from which they are made and how they degrade and how to preserve and conserve them It also examines the theoretical underpinnings of conservation what and how to treat and the ethical cultural and economic implications of treatment Technical drawings and photographs illustrate the structures and treatments examined throughout the book Ultimately readers gain an in depth understanding of the materiality of books in numerous global contexts and reflect on the practical considerations involved in their analysis and treatment Conservation of Books is a quintessential reference work for book conservators and anyone working with books such as collection managers librarians curators dealers collectors historians and related professionals It is also an indispensable text for students to complement hands on training in this field *Microbial Biotechnology Approaches to Monuments of Cultural Heritage* Ajar

Nath Yadav,Ali Asghar Rastegari,Vijai Kumar Gupta,Neelam Yadav,2020-06-24 Our country s cultural legacy is one of the world s most diverse drawing millions of visitors every year to our convents and monuments and to our museums libraries concert halls and festivals In addition it is a dynamic trigger of economic activity and jobs Among the various scientific branches microbial biotechnology offers an innovative and precise approach to the complexity of problems that restorers face in their daily work This book discusses a range of topics including the biodiversity of microbial communities from various cultural heritage monuments microbial biotechnological cleaning techniques the role of bacterial fungal communities for the conservation of cultural heritage and microbial enzymes and their potential applications as biorestation agents Written by internationally recognized experts and providing up to date and detailed insights into microbial biotechnology approaches to cultural heritage monuments the book is a valuable resource for biological scientists especially microbiologists microbial biotechnologists biochemists and microbial biotechnologists *Routledge Handbook of Sustainable Heritage* Kalliopi

Fouseki,May Cassar,Guillaume Dreyfuss,Kelvin Ang Kah Eng,2022-07-29 This handbook presents cutting edge and global insights on sustainable heritage engaging with ideas such as data science in heritage climate change and environmental challenges indigenous heritage contested heritage and resilience It does so across a diverse range of global heritage sites Organized into six themed parts the handbook offers cross disciplinary perspectives on the latest theory research and practice Thirty five chapters offer insights from leading scholars and practitioners in the field as well as early career

researchers This book fills a lacuna in the literature by offering scientific approaches to sustainable heritage as well as multicultural perspectives by exploring sustainable heritage in a range of different geographical contexts and scales The themes covered revolve around heritage values and heritage risk participatory approaches to heritage dissonant heritage socio environmental challenges to heritage sustainable heritage led transformation and new cross disciplinary methods for heritage research This book will be an invaluable resource for students and scholars in heritage studies archaeology museum studies cultural studies architecture landscape urban design planning geography and tourism

Coping with Biological Growth on Stone Heritage Objects Daniela Pinna, 2017-05-18 Coping with Biological Growth on Stone Heritage Objects Methods Products Applications and Perspectives offers hands on guidance for addressing the specific challenges involved in conserving historical monuments sculptures archaeological sites and caves that have been attacked and colonized by micro and macroorganisms The volume provides many case studies of removal of biological growth with practical advice for making the right choices It presents detailed and updated information related to biocides and to alternative substances features that will be valuable to dealing with these challenges The author's goal is to provide access to information and offer the conceptual framework needed to understand complex issues so that the reader can comprehend the nature of conservation problems and formulate her his own views From bacteria to plants biological agents pose serious risks to the preservation of cultural heritage In an effort to save heritage objects buildings and sites conservators activities aim to arrest mitigate and prevent the damages caused by bacteria algae fungi lichens plants and birds Although much has been learned about these problems information is scattered across meeting proceedings and assorted journals that often are not available to restorers and conservators This book fills the gap by providing a comprehensive selection and examination of international papers published in the last fifteen years focusing on the appropriate methods techniques and products that are useful for the prevention and removal of micro and macroorganisms that grow on artificial and natural stone works of art including wall paintings Results on new substances with antimicrobial properties and alternative methods for the control of biological growth are presented as well The book also emphasizes issues on bioreceptivity of stones and the factors influencing biological growth and includes an outline of the various organisms able to develop on stones a discussion on the bioprotection of stones by biofilms and lichens a review of the main analytical techniques and a section on bioremediation This volume will be a valuable reference for cultural heritage conservators and restorers scientists and heritage site staff involved in conservation and maintenance of buildings archaeological sites parks and caves

Structural Studies, Repairs and Maintenance of Heritage Architecture XIII C. A. Brebbia, 2013-06-25 Architectural heritage is now recognised to be of great importance to the historical identity In order to take care of the architectural heritage of a region town or nation now recognised as of great importance to their historical identity we need to share experiences and knowledge regarding heritage preservation in many parts of the world Covering advances in this field presented at the thirteenth in a series of now biennial

conferences that began in 1989 this book covers such topics as Heritage architecture and historical aspects Learning from the past Surveying and monitoring Performance and maintenance Structural restoration of metallic structures Preservation and monitoring Earth construction Modern 19th 20th century heritage Maritime heritage Heritage masonry buildings Stone masonry walls Wooden structures Simulation and modelling Material characterization New technologies or materials Corrosion and material Decay Seismic vulnerability Non destructive techniques Assessment and re use of heritage buildings Heritage and tourism Social and economic aspects in heritage Guidelines codes and regulations for heritage

The Conservation of Subterranean Cultural Heritage C. Saiz-Jimenez, 2014-10-24 This proceedings volume contains selected papers presented at the Workshop on the Conservation of the Subterranean Cultural Heritage held 25-27 March 2014 in Seville Spain The workshop was organized by the Spanish Network of Science and Technology for the Conservation of Cultural Heritage TechnoHeritage Contributions cover the following fields archaeology history conservation maintenance and restoration architectural sciences and engineering

World heritage in the high seas Freestone, David, Laffoley, Dan, Douvère, Fanny, Badman, Tim, IUCN, 2016-08-08

Science and Digital Technology for Cultural Heritage - Interdisciplinary Approach to Diagnosis, Vulnerability, Risk Assessment and Graphic Information Models Pilar Ortiz Calderón, Francisco Pinto Puerto, Philip Verhagen, Andrés Prieto, 2019-11-28 The scientific and technological advances that influence the protection of cultural heritage are developing at an ever increasing pace Systems to explore research and analyse their materiality to control the different scopes or to represent and model them have reached an unprecedented dimension in recent decades The Network of Science and Technology for the Conservation of Cultural Heritage aims to promote collaboration between the agents of these systems in order to facilitate the sharing of experiences and to foster technology transfer with the common goal of contributing to the conservation of Cultural Heritage In the context of the TechnoHeritage Network the fourth edition of the International Congress on Science and Technology for the Conservation of Cultural Heritage was held March 26-30 2019 in Seville Spain This Congress was an international meeting of researchers and specialists from multiple areas whose line of work is the knowledge and conservation of Cultural Heritage Among all the topics discussed the role and impact of digital technologies for the knowledge maintenance management and dissemination of cultural heritage should be highlighted Digital media modify the way of understanding this heritage of perceiving it and transmitting it and offer a new horizon of strategies to make decision making more sustainable over time

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