

Archaeology The Science Of The Human Past

Archaeology The Science of the Human Past Pearson College Division

An accessible and wide-ranging introduction to the exciting and expanding field of archaeological science, for students, professionals and academics.

This book is an introductory manual that explains the basic concepts of chemistry behind scientific analytical techniques and that reviews their application to archaeology. It explains key terminology, outlines the procedures to be followed in order to produce good data, and describes the function of the basic instrumentation required to carry out those procedures. The manual contains chapters on the basic chemistry and physics necessary to understand the techniques used in analytical chemistry, with more detailed chapters on Atomic Absorption, Inductively Coupled Plasma Emission Spectroscopy, Neutron Activation Analysis, X-ray Fluorescence, Electron Microscopy, Infra-red and Raman Spectroscopy, and Mass Spectrometry. Each chapter describes the operation of the instruments, some hints on the practicalities, and a review of the application of the technique to archaeology, including some case studies. With guides to further reading on the topic, it is an essential tool for practitioners, researchers and advanced students alike.

Discusses forms of soil distinctive to Australia.

This Open Access book explains that after long periods of prehistoric research in which the importance of the archaeological as well as the natural context of rock art has been constantly underestimated, research has now begun to take this context into focus for documentation, analysis, interpretation and understanding. Human footprints are prominent among the long-time under-researched features of the context in caves with rock art. In order to compensate for this neglect an innovative research program has been established several years ago that focuses on the merging of indigenous knowledge and western archaeological science for the benefit of both sides. The book gathers first the methodological diversity in the analysis of human tracks. Here major representatives of anthropological, statistical and traditional approaches feature the multi-layered methods available for the analysis of human tracks. Second it compiles case studies from around the globe of prehistoric human tracks. For the first time, the most important sites which have been found worldwide are published in a single publication. The third focus of this book is on firsthand experiences of researchers with indigenous tracking experts from around the globe, expounding on how archaeological science can benefit from the ancestral knowledge. This book will be of interest to professional archaeologists, graduate students, ecologists, cultural anthropologists and laypeople, especially those focussing on hunting-gathering and pastoralist communities and who appreciate indigenous knowledge.--

Intended as a text for students in upper-division-undergraduate and graduate-level courses as well as a manual for professional researchers and cultural resource management practitioners, the book is abundantly illustrated and referenced and includes a glossary of key terms.

Suggested laboratory exercises to accompany the text are available on a web site."--BOOK JACKET.

Archaeological Science meetings will have a personality of their own depending on the focus of the host archaeological fraternity itself. The 8th Australasian Archaeometry meeting follows this pattern but underlying the regional emphasis is the continuing concern for the processes of change in the landscape that simultaneously effect and illuminate the archaeological record. These are universal themes for any archaeological research with the increasing employment of science-based studies proving to be a key to understanding the place of humans as subjects and agents of change over time. This collection of refereed papers covers the thematic fields of geoarchaeology, archaeobotany, materials analysis and chronometry, with particular emphasis on the first two. The editors Andrew Fairbairn, Sue O'Connor and Ben Marwick outline the special value of these contributions in the introduction. The international nature of archaeological science will mean that the advances set out in these papers will find a receptive audience among many archaeologists elsewhere. There is no doubt that the story that Australasian archaeology has to tell has been copiously enriched by incorporating a widening net of advanced science-based studies. This has brought attention to the nature of the environment as a human artefact, a fact now more widely appreciated, and archaeology deals with these artefacts, among others, in this way in this publication.

Designing Experimental Research in Archaeology is a guide for the design of archaeological experiments for both students and scholars. Experimental archaeology provides a unique opportunity to corroborate conclusions with multiple trials of repeatable experiments and can provide data otherwise unavailable to archaeologists without damaging sites, remains, or artifacts. Each chapter addresses a particular classification of material culture-ceramics, stone tools, perishable materials, composite hunting technology, butchering practices and bone tools, and experimental zooarchaeology-detailing issues that must be considered in the development of experimental archaeology projects and discussing potential pitfalls. The experiments follow coherent and consistent research designs and procedures and are placed in a theoretical context, and contributors outline methods that will serve as a guide in future experiments. This degree of standardization is uncommon in traditional archaeological research but is essential to experimental archaeology. The field has long been in need of a guide that focuses on methodology and design. This book fills that need not only for undergraduate and graduate students but for any archaeologist looking to begin an experimental research project.

Hayden introduces general readers to the real work of this captivating science, describes basic concepts and tools, and answers the questions that archaeology seeks to resolve: how did complex societies evolve? What caused them to change and collapse? What can our understanding of the past tell us about our society and its future? Illustrations.

Covering aspects of archaeological science such as artefact analysis, ancient technology, trade and exchange, and dating materials, this book critically explores the pace and application of scientific techniques in the discipline of archaeology. Massive advances in archaeological understanding through the application of science have been made in areas that were once thought to be unrecoverable. Nevertheless the application of increasingly sophisticated analytical techniques has often masked poor archaeological questions, or perhaps stated something which can sometimes be blindingly obvious to simple non-technical observation. Conversely some aspects of our understanding of the past, which were once thought obvious, have been thrown into confusion by revelations born of the advances in archaeological science. The use and abuse of science within archaeological understanding are presented through a series of case studies.

This volume is the third in the Advances in Archaeological and Museum Science series sponsored by the Society for Archaeological Sciences (SAS). The purpose of this series is to provide summaries of advances in various topics in archaeometry, archaeological science, environmental archaeology, preservation technology, and museum conservation. The SAS exists to encourage interdisciplinary collaboration between archaeologists and colleagues in the natural and physical sciences. SAS members are drawn from many disciplinary fields. However, they all share a common belief that physical science techniques and methods constitute an essential component of contemporary archaeological field and laboratory studies. The series editors wish to thank the reviewers of each of the chapters in this volume for their excellent comments and suggestions. We also wish to thank Chriss Jones for her invaluable assistance in the preparation of the texts for submission to the publisher. xi Preface As noted

in the introductory chapter, this volume is the second major review of research progress in the study of archaeological obsidian. An earlier book, *Advances in Obsidian Glass Studies: Archaeological and Geochemical Perspectives*, appeared in 1976. A comparison of the treatment of topics reflected in this earlier work and that contained in this volume not only highlights important advances in the quality and depth of research on archaeological obsidian over more than a quarter of a century but also illustrates more generally some characteristics of developments in the archaeological science field in general.

The subject of 'Molluscs in Archaeology' has not been dealt with collectively for several decades. This new volume in Oxbow's *Studying Scientific Archaeology* series addresses many aspects of mollusks in archaeology. It will give the reader an overview of the whole topic; methods of analysis and approaches to interpretation. It aims to be a broad based text book giving readers an insight of how to apply analysis to different present and past landscapes and how to interpret those landscapes. It includes Marine, Freshwater and land snails studies, and examines topics such as diet, economy, climate, environmental and land-use, isotopes and mollusks as artifacts. It aims to provide archaeologists and students with the first port of call giving them a) methods and principles, and b) the potential information mollusks can provide. It concentrates on analysis and interpretation most archaeologists and students can undertake and understand, and to 'review' the 'heavier' science in terms of potential, application and interpretational value.

Is archaeology an art or a science? This question has been hotly debated over the last few decades with the rise of archaeological science. At the same time, archaeologists have seen a change in the intellectual character of their discipline, as many writers have adopted approaches influenced by social theory. The discipline now encompasses both archaeological scientists and archaeological theorists, and discussion regarding the status of archaeology remains polarised. In this 2001 book, Andrew Jones argues that we need to analyse the practice of archaeology. Through an analysis of archaeological practice, influenced by recent developments in the field of science studies, and with the aid of extensive case studies, he develops a new framework which allows the interpretative and methodological components of the discipline to work in tandem. His reassessment of the status and character of archaeology will be of interest to students, scholars and professionals.

Archaeology studies human cultures through the recovery, documentation, analysis and interpretation of material remains and environmental data, including architecture, artefacts, features, biofacts, and landscapes. Because archaeology's aim is to understand mankind, it is a humanistic endeavour. The goals of archaeology vary, and there is debate as to what its aims and responsibilities are. Some goals include the documentation and explanation of the origins and development of human cultures, understanding culture history, chronicling cultural evolution, and studying human behaviour and ecology, for both prehistoric and historic societies. This advanced book presents important research in the field.

Illuminating the world of archaeology. Archaeology conveys the excitement of archaeological discovery and explains how archaeologists think as they scientifically find, analyze, and interpret evidence. The main objective of this text is to provide an introduction to the broad and fascinating world of archaeology from the scientific perspective. Discussions on the theoretical aspects of archaeology, as well as the practical applications of what is learned about the past, have been updated and expanded upon in this fourth edition. Learning Goals Upon completing this book, readers will be able to: Discuss the theoretical aspects of archaeology. Apply what has been learned about the past. Identify the various perspectives archaeologists have. Note: MySearchLab with eText does not come automatically packaged with this text. To purchase MySearchLab with eText, please visit: www.mysearchlab.com or you can purchase a ValuePack of the text + MySearchLab with eText (at no additional cost): ValuePack ISBN-10: 020589531X / ValuePack ISBN-13: 9780205895311.

Puts The Archaeology of Knowledge at the heart of Foucault's thought David Webb reveals the extent to which Foucault's approach to language in *The Archaeology of Knowledge* was influenced by the mathematical sciences, adopting a mode of thought indebted to thinkers in the scientific and epistemological traditions. By aligning his thought with the challenge to Kantian philosophy from mathematics and science in the late-19th and early-20th centuries, he shows how Foucault established his own perspective on the future of critical philosophy.

A renowned expert in the field of bio-archaeology presents a fascinating foray into the most significant archaeological breakthroughs that have forever altered our comprehension of the human past, detailing the discoveries and analyses that have helped revise the human genealogical tree and answer questions that have befuddled researchers for years. 15,000 first printing. One of the most significant developments in archaeology in recent years is the emergence of its environmental branch: the study of humans' interactions with their natural surroundings over long periods and of organic remains instead of the artifacts and household items generally associated with sites. With the current attention paid to human responsibility for environmental change, this innovative field is recognized by scientists, conservation and heritage managers and policymakers worldwide. In this context comes *Environmental Archaeology* by Elizabeth Reitz and Myra Shackley, updating the seminal 1981 text *Environmental Archaeology* by Myra Shackley. Rigorously detailed yet concise and accessible, this volume surveys the complex and technical field of environmental archaeology for researchers interested in the causes, consequences and potential future impact of environmental change and archaeology. Its coverage acknowledges the multiple disciplines involved in the field, expanding the possibilities for using environmental data from archaeological sites in enriching related disciplines and improving communication among them. Introductory chapters explain the processes involved in the formation of sites, introduce research designs and field methods and walk the reader through biological classifications before focusing on the various levels of biotic and abiotic materials found at sites, including: Sediments and soils. Viruses, bacteria, archaea, protists and fungi. Bryophytes and vascular plants. Wood, charcoal, stems, leaves and roots. Spores, pollen and other microbotanical remains. Arthropods, molluscs, echinoderms and vertebrates. Stable isotopes, elements and biomolecules. The updated *Environmental Archaeology* is a major addition to the resource library of archaeologists, environmentalists, historians, researchers, policymakers—anyone involved in studying, managing or preserving historical sites. The updated *Environmental Archaeology* is a major addition to the resource library of archaeologists, environmentalists, historians, researchers, policymakers—anyone involved in studying, managing, or preserving historical sites.

Many archaeologists, as primarily social scientists, do not have a background in the natural sciences. This can pose a problem because they need to obtain chemical and physical analyses on samples to perform their research. This manual is an essential source of information for those students without a background in science, but also a comprehensive overview that those with some understanding of archaeological science will find useful. The manual provides readers with the knowledge to use archaeological science methods to the best advantage. It describes and explains the analytical techniques in a manner that the average

in archaeology. Archaeological Chemistry enables scientists to tackle the fundamental issues of chemical change in the archaeological materials, in order to advance the study of the past. It will prove an essential companion to students in archaeological science and chemistry, field and museum archaeologists, and all those involved in conserving human artefacts.

Environmental Archaeology: Theoretical and Practical Approaches outlines and assesses the various methods used to reconstruct and explain the past interaction between people and their environment. Emphasising the importance of a highly scientific approach to the subject, the book combines geoarchaeological, bioarchaeological (archaeobotany and zooarchaeology) and geochronological information and examines how these various aspects of archaeology may be used to enhance our knowledge and understanding of past human environments. Drawing from both the practical experiences of the authors and cutting-edge research, Environmental Archaeology: Theoretical and Practical Approaches is a valuable contribution to the subject. It will be essential reading for students and professionals in archaeology, geography and anthropology.

"This book provides an integrated interdisciplinary approach to the study of a complex and fascinating ancient material. A variety of aspects of ancient glass is discussed including principally archaeology, history, chemical analysis, materials science, geology and botany. The aims of the book are to explore these aspects by using a combination of focused studies and case studies in a variety of ancient and historical periods. Each case study, in Bronze Age Mesopotamia, Late Hellenistic-early Roman Middle East and the Islamic world, has been selected so as to incorporate contrasting social, political, economic and ritual contexts in which glass was manufactured, traded and used. These contrasting characteristics of societies therefore influenced the ways in which glass fitted into society: the ways in which it was manufactured and used. The relationships between production, trade and use of ancient materials including glass are complex. The scale of production involving a range of facilities and critical combinations of raw materials from a variety of sources were characteristic of the specific society and their ideologies. Each step in the chaîne opératoire involved decisions, each with a social impact and significance leading to the manufacture of glass artefacts characteristic of that society. The control over each aspect of production was a reflection of the degree of social hierarchy, (perhaps involving social elites) and complexity at the time"--

Using a combination of historical, archaeological, and scientific data is not an uncommon research practice. Rarely found, however, is a more overt critical consideration of how these sources of information relate to each other, or explicit attempts at developing successful strategies for interdisciplinary work. The authors in this volume provide such critical perspectives, examining materials from a wide range of cultures and time periods to demonstrate the added value of combining in their research seemingly incompatible or even contradictory sources. Case studies include explorations of the symbolism of flint knives in ancient Egypt, the meaning of cuneiform glass texts, medieval metallurgical traditions, and urban archaeology at industrial sites. This volume is noteworthy, as it offers novel contributions to specific topics, as well as fundamental reflections on the problems and potentials of the interdisciplinary study of the human past.

The archaeological record is a combination of what is seen by eye, as well as the microscopic record revealed with the help of instrumentation. The information embedded in the microscopic record can significantly add to our understanding of past human behaviour, provided this information has not been altered by the passage of time. Microarchaeology seeks to understand the microscopic record in terms of the type of information embedded in this record, the materials in which this information resides, and the conditions under which a reliable signal can be extracted. This book highlights the concepts needed to extract information from the microscopic record. Intended for all archaeologists and archaeological scientists, it will be of particular interest to students who have some background in the natural sciences as well as archaeology.

An advanced resource on the emerging trends and foundational theories of archaeological science, offering students and scholars a reliable reference on the most current techniques and practices The Encyclopedia of Archaeological Sciences provides an authoritative and comprehensive overview of the scientific concepts and techniques that have shaped the contemporary discipline of archaeology. Sponsored by the Society for Archaeological Sciences, this is an essential resource on core topics in the integration of scientific methods into archaeological practice with extensive coverage on subjects of interdisciplinary interest, describing both the latest in technological and scientific developments as well as the foundational theoretical approaches that connect archaeology to broader topics in the social sciences and humanities. In a four-volume set comprised of over 480 entries as selected by leading researchers in the field, this encyclopedic reference work represents the contributions of scholars working all over the world, making this a truly international resource, suitable to support the work of archaeologists engaged with global questions on both the past and future of the discipline. Designed to provide detailed information on theoretical and applied topics, The Encyclopedia of Archaeological Sciences covers the foundations of archaeological science, modern field methods in archaeology, scientific techniques for the analysis of the characteristics and properties of materials, applications of mathematics and computer sciences, conservation studies, and theoretical approaches to the study of material culture and the applications of archaeological science. Working to support the integration of scientific methods and technologies into the standard practice and study of archaeology, The Encyclopedia of Archaeological Sciences is built upon the most important advances in recent scholarship and offers informed insight into the future of archaeology as a scientific discipline. This work is also available as an online resource:

www.archaeologicalsciencesencyclopedia.com

A Companion to Archaeology features essays from 27 of the world's leading authorities on different types of archaeology that aim to define the field and describe what it means to be an archaeologist. Shows that contemporary archaeology is an astonishingly broad activity, with many contrasting specializations and ways of approaching the material record of past societies. Includes essays by experts in reading the past through art, linguistics, or the built environment, and by professionals who present the past through heritage management and museums. Introduces the reader to a range of archaeologists: those who devote themselves to the philosophy of archaeology, those who see archaeology as politics or anthropology, and those who contend that the essence of the discipline is a hard science.

This volume provides a narrative of early hominin evolution, linking material aspects of the early archaeological record with social, cognitive and symbolic landscapes.

Science in the Study of Ancient Egypt takes an innovative and integrated approach to the use of scientific techniques and methodologies within the study of ancient Egypt. Accessibly demonstrating how to integrate scientific methodologies into Egyptology broadly, and in Egyptian archaeology in particular, this volume will help to maximise the amount of information that can be obtained within a study of ancient Egypt, be it in the field, museum, or laboratory. Using a range of case studies which exemplify best practice within Egyptian archaeological science, Science in the Study of Ancient Egypt presents both the scientific methods of analysis available and their potential applications to Egyptologists. Although Egyptology has mainly shown a marked lack of engagement with recent archaeological science, the authors illustrate the inclusive but varied nature of the scientific archaeology which is now being undertaken, demonstrating how new analytical techniques can develop greater understanding of Egyptian data.

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