

# MATERIALIZING THE MILITARY

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science  
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Published 2005 by NMSI Trading Ltd, Science Museum,  
Exhibition Road, London SW7 2DD

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Designed by Jerry Fowler  
Printed in England by the Cromwell Press

ISBN 1 900747 60 X  
ISSN 1029-3353

Website <http://www.nmsi.ac.uk>

### *Artefacts series: studies in the history of science and technology*

In growing numbers, historians are using technological artefacts in the study and interpretation of the recent past. Their work is still largely pioneering, as they investigate approaches and modes of presentation. But the consequences are already richly rewarding. To encourage this enterprise, three of the world's greatest repositories of the material heritage of science and technology: the Deutsches Museum, the Science Museum and the Smithsonian Institution, are collaborating on this book series. Each volume treats a particular subject area, using objects to explore a wide range of issues related to science, technology and medicine and their place in society.

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Bernard Finn, Smithsonian Institution, Washington DC  
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## Series preface

In prefaces to earlier volumes we have explained that we determined, in the mid-1990s, to develop a forum for the discussion of ways in which objects can be used for the serious study of the history of science and technology. Given our backgrounds as professional museum curators, it is hardly surprising that we were confident that we would come up with a number of compelling examples. We did; and we have been pleased to share them with you.

This is our fifth volume, and it seems an appropriate point to look back and consider how well we have met our expectations and how far we still have to go. We have published some 30 articles in five subject areas (medicine, electronics, transport, production and communication of images, and now military history), which provide a large enough sample to make it reasonable to seek a few generalisations.

In *Tackling Transport* Michael Bailey and John Glithero express feelings of fascination and excitement as they examine the *Rocket* locomotive, and in *Presenting Pictures* one can sense similar emotions in Oskar Blumtritt's approach to the 'telecinema' equipment associated with Manfred von Ardenne. All of which suggests that historians are not exempt from the kinds of reactions that ordinary people may have in the presence of old things. And, just like anyone else, historians may be stimulated to probe deeper. Frequently there is nothing more of interest to be found. But often enough, as in these cases, such investigations are rewarded with new information and fresh insights.

In Alan Morton's treatment of J J Thomson and the cathode ray tube he gave to the Science Museum (*Exposing Electronics*), and even more in the analysis that David Rhees and Kirk Jeffrey make of Earl Bakken's relationship to his pacemaker (also *Exposing Electronics*), we find that inventors themselves can be fascinated by the objects they have created. Both Thomson and Bakken used their objects as icons to promote recognition of their inventive genius.

In such disparate examples as microchips (Ross Bassett in *Exposing Electronics*), macrocircuits (Paul Ceruzzi, also in *Exposing Electronics*), and automobile interiors (Gijs Mom in *Tackling Transport*) we find that technical design can be idiosyncratic to the point of providing valuable historical insights. Furthermore, the insights can be quite different, ranging in these cases from corporate marketing strategies, to individual inventor proclivities, to the technology–consumption interface.

The physical distribution of objects can be significant. Larry Schaaf's description of the wide dispersion of Talbot material (*Presenting Pictures*) provides strong evidence of the popularity and influence of that photographic pioneer. At a different level – both in scale and stratigraphically – John Guilmartin (in the present volume)

examines English and Dutch cannons that were recovered from a Portuguese warship and is able to make judgments about how arms were recycled among the world's navies in the seventeenth century.

Survival of objects, and thus their availability to scholars, is often a matter of happenstance. This means that the reputations of individuals, the technical abilities of societies and a host of other large and small historical phenomena are subject to the arbitrariness of disasters (both natural and man-made) and to other accidents associated with the passage of time. Of course it also helps to be highly productive of physical objects and written records in the first place. Schaaf shows how the combination of good fortune and high productivity have served Talbot very well, as opposed to his contemporaries Daguerre and Wollaston and Wheatstone. Others touch on aspects of this argument, such as Paul Forman on 'Rabi's Relics' (*Exposing Electronics*) and Christine Finn (the present volume) in her analysis of the significance of the relics of German occupation left on the island of Jersey after the Second World War.

A closer examination of articles published in 'Artefacts' and elsewhere will no doubt reveal other ways that the study of material remains can enrich our studies of the history of science and technology. 'Enrich' seems an appropriate word, because unlike the traditional archaeologists we are for the most part studying periods where the availability of a written record is substantial, indeed even overwhelming. This means that we also need to consider how we express ourselves, and whether the objects complement or contradict the surviving words. The task can be especially challenging in the medium of the book, since the object that lies at the focus of our argument is reduced to being described in words and pictures. Are there special techniques that need to be developed? Should we be pressing the reader to treat our pictures as partners with the text, to be examined critically for special revelations and not seen simply as pretty adornments as is more commonly the case?

As museum curators we face a similar but more daunting challenge. In our exhibits we have the great advantage of being able to display the objects themselves. But the exhibition floor is not an ideal venue for serious reflection. As a consequence, there is a danger that we will avoid complex arguments, keep text to a minimum, and lose the opportunity not only to say something meaningful but also to educate our visitors to an understanding of how the things around us can convey messages.

In the pages of 'Artefacts' we have made occasional forays into a consideration of this dilemma without reaching any substantive conclusions. Jon Eklund and Bernard Finn (in *Exposing Electronics*) reveal how they anticipated that certain objects would support arguments made in the Smithsonian's 'Information Age' exhibition. In a response, Roger Bridgman pessimistically indicates his belief

that it is fruitless even to try to use objects in this way in modern exhibitions that tend to be organised around large social themes. In the present volume Robert Friedel has a different frustration because the exhibition (on American military history) lacks a clear thematic statement against which the presentation of objects can be measured. He also identifies another disturbing trend in the use of props as objects and objects as props. The value of the object as evidence is inevitably eroded by the confusion that this produces in the visitor's mind.

The growing interest that scholars have in questioning exhibitions – which can be seen in the number of journals that regularly publish exhibition reviews – causes us to believe that we are on the right track. The material relics of science and technology are no longer to be preserved and displayed simply as curiosities or as celebratory icons. They are evidence of historical processes. Academic historians are learning to incorporate them into what were previously object-free discourses, and museum curators are learning to display them in support of story lines based on intellectually serious themes.

We intend to encourage these trends as we continue the 'Artefacts' series. We invite, indeed challenge, our readers to be critical of our attempts and to join in the discussion.

## Notes on contributors

**Kelly DeVries** is Professor of History at Loyola College in Maryland. His books include *Medieval Military Technology, Infantry Warfare in the Early Fourteenth Century*, *The Norwegian Invasion of England in 1066* and *Joan of Arc: A Military Leader*. He holds a PhD in medieval studies from the Centre for Medieval Studies at the University of Toronto.

**Bernard Finn** is curator emeritus at the Smithsonian's National Museum of American History and adjunct professor at the University of Maryland. His research interests are primarily in the history of museums and of electrical technology.

**Christine Finn** is an author, broadcaster, journalist and archaeologist. She has a DPhil in archaeology from Oxford University and is a Fellow of the Society of Antiquaries. Her books include *Artifacts: An Archaeologist's Year in Silicon Valley* and (as co-editor) *Outside Archaeology: Material Culture and the Poetic Imagination*. She is a former contributing editor of *Archaeology* magazine and has also written for the *Guardian*, *The Sunday Times*, the *V&A Magazine* and *New Scientist*.

**Robert Friedel** is Professor of History at the University of Maryland, where he has taught history of technology and science since 1984. Prior to his current appointment, he was director of the IEEE Center for the History of Electrical Engineering in New York City. His museum work includes exhibitions at the Smithsonian's National Museum of American History and the National Building Museum.

**John F Guilmartin, Jr** teaches military, maritime and early modern European history at Ohio State University. He served two combat tours as a rescue helicopter pilot in the Vietnam War, the second one after receiving his PhD in history from Princeton. His publications include *Gunpowder and Galleys: Changing Technology and Mediterranean Warfare at Sea in the Sixteenth Century* and *A Very Short War: The Mayaguez and the Battle of Koh Tang*.

**Barton C Hacker** has a PhD in history from the University of Chicago and is curator of military history at the Smithsonian's National Museum of American History in Washington DC. He has published extensively on the history of military technology, women's military history and the comparative history of military institutions.

**Katherine Ott**, curator at the Smithsonian's National Museum of American History, in the Division of Medicine and Society, works on the history of disability, medicine and the body. She is the author of *Fevered Lives; Tuberculosis in American Culture Since 1870* and co-editor of *Artificial Parts and Practical Lives, The Modern History of Prosthetics*.

**Jan Piet Puype** is senior consultant to the board of directors of the Legermuseum in Delft, the Netherlands. He was educated as a naval officer, but since 1970 he has made a career as a writer, lecturer and curator of exhibitions on arms, armour and tactics. He specialises in Western swords and historical naval ordnance, his chief publication being the three-volume catalogue *Arms of the Netherlands in the Collection of H.L. Visser*.

**Nicholas J Saunders** is Reader in Material Culture at the Department of Anthropology, University College London. Between 1998 and 2001 he was a British Academy Institutional Fellow, investigating the anthropology of the First World War. He is co-editor of the UCL Press series *Material Culture, Conflict and Modernity*.

**Robert D Smith** worked for the British Royal Armouries for almost 30 years and is now an independent scholar specialising in research in medieval and early modern artillery and gunpowder.

**Margaret S Vining** is a curatorial historian in the Division of Military and Diplomatic History at the Smithsonian's National Museum of American History, where she has served as a principal curator of numerous exhibitions and played a key role in acquiring the Colonial Dames uniform collection.

**Deborah Warner** is curator of the physical sciences collection in the National Museum of American History. She believes that museums should identify and explicate the objects in their care.



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Barton C Hacker and Bernard Finn

## *Introduction*

When one thinks of the history of military technology, the images that first come to mind are of arms and armour. And readers of this volume will not be disappointed. Three contributions (DeVries and Smith, Guilmartin, Puype) bring fresh insights to a well-travelled consideration of arms of the early modern period. This freshness is due in large part to the focus on the objects. But what may be surprising is the breadth of topics that can be creatively pursued if one examines carefully the material record. Looking at things, from uniforms and sextants to artificial legs and washing machines, can help us answer questions that we didn't even know could be asked. Strung together, these contributions provide us with a valuable body of research reaching back as far as the fifteenth century.

The book has its origins in a meeting at the Smithsonian's National Museum of American History in October 2001. The conference was sponsored, as are all 'Artefacts' activities, by the Smithsonian together with the Science Museum and the Deutsches Museum. Ironically, one might say, it occurred in the aftermath of the opening of a new kind of war, symbolised by the hijacking attacks of September 11. Participation by our European colleagues was understandably curtailed, but the event was otherwise highly successful. Half the articles included here emerged from that meeting; the rest were solicited from other scholars in the field, a primary consideration (as in other volumes) being to provide overall balance.

Kelly DeVries and Robert Smith offer us an account of their recently completed study of fifteenth-century Burgundian gunpowder weapons. The main product is a database of heroic proportions. The chapter presented here provides readers with an opportunity to sample the fruits of their labours and to appreciate the extent of the information that is now available. Of particular interest is the intricate mixture of artefactual and documentary evidence; they complement each other elegantly, making possible a special richness in the historical studies that will surely follow. In their brief summary of the complex ways that the introduction of gunpowder weapons affected the conduct of warfare, the authors suggest some of the value one may expect from such studies.

John Guilmartin has looked at a much narrower collection of guns (from a single ship) two centuries later. He examines them from, it would seem, every conceivable point of view, learning something at every step of the way. The pattern of guns on the ocean floor, their weight (both according to markings and experimentally determined),

their dimensions, the material out of which they are made, their ornamentation – all are consulted to make judgments about comparative levels of craftsmanship in various European countries, the state of the Portuguese economy and durability of guns over time. By implication the article makes a strong case for the protection of underwater sites, at a time when new technologies are making them ever more vulnerable to amateur probing.

The damage that these early cannon wreaked on human bodies could sometimes be repaired, but, as Katherine Ott argues, it took the large-scale production of amputees in the American Civil War to stimulate serious consideration of technological solutions to the design of replacement limbs. By the end of the nineteenth century an understanding of the origins of infection led to significantly higher survival rates for wounded soldiers, with the result that wars in the twentieth (and now twenty-first) century gave new incentives to the prosthetic industry, especially when governments, with politically understandable compassion, have been willing to pay for so much of the cost. Provoked by the Smithsonian's collections, Ott has opened up a new opportunity to study the impact of the military on technology.

For Margaret Vining and Bart Hacker the museum's holdings present an opportunity to pursue a quite different line of inquiry. After the First World War the National Society of the Colonial Dames, many of whose members had served during the conflict, began collecting women's uniforms, which they loaned to the Smithsonian for exhibition in the 1920s. These uniforms, augmented by others, eventually became part of the museum's collections. In no other war in American history has so broad a range of non-governmental organisations put so many women of such relatively high social status in uniform. Looking at these uniforms raises a host of fascinating questions about the roles that women were playing, and wanted to play, not only in the United States but also throughout Europe. Further research should shed new light on this much-studied era.

Nicholas Saunders makes a broader plea for preservation and interpretation of the artefacts of the Great War (and others). He is especially interested in memorabilia collected or constructed either by soldiers during the war as personal mementoes, or by civilians during and after the war (to 1939) for sale. He suggests that these relics comprise a material culture that was purposely created and which can therefore help us understand how people react to war, and how war shapes them for the peacetime that follows.

Deborah Warner returns us to a consideration of how the military can influence development of technology, even during peacetime. She studies celestial navigational instruments (sextants), the instruments of a technique with a very long history that gained new adherents in the 1920s and 1930s as international travel, especially by air, increased.

This was very much an international technology, both in terms of those who contributed to it and of the way it was disseminated – one consequence being, for instance, that American-made sextants were being actively promoted for sale in Japan.

Christine Finn looks at a very special application of material culture related to the Second World War. Invaded by German forces in June 1940, the Channel Islands (principally Jersey and Guernsey) remained under occupation during most of the conflict. Afterwards, the memories of residents mixed pride at having survived with shame over the means that some employed to make survival possible, including collaboration and black marketeering. It was something they avoided discussing. Yet material reminders of the occupation were literally built into the landscape, most particularly in the fortifications and tunnels along the coast. In recent years, on Jersey, these have been developed as visitor attractions, one consequence being that the islanders themselves have had to come to terms with their own past.

In the section of this book focusing on exhibits and museums, Bart Hacker describes an exhibition on nuclear submarines in the Cold War ('Fast Attacks and Boomers'). He explains how, as its curator, he used objects to juxtapose highly sophisticated weapons of destruction with mundane washing machines. There were also matters of scale, contrasting the relatively large size of the submarine (through a mock-up 'sail') with the cramped quarters for the crew (stacked bunks with shallow bins for storage). Overall there was an attempt to fit the technology of the ship and its weapons into a social context of geopolitics on the one hand and, on the other, of the lives of the crew and their families.

The submarine exhibition was a modest-sized temporary show. A much grander exhibition, occupying the same space and considerably more, is 'The Price of Freedom: Americans at War', which covers American military history by looking at conflicts from the French and Indian wars of the eighteenth century to the Iraq war of the twenty-first. Robert Friedel examines the exhibition, which features some 800 objects but lacks an explicit statement of purpose. He critically assesses the use of objects in relation to images and other display features in the light of what he deduces to be the exhibition's goals.

Finally, Jan Piet Puype makes an impassioned plea for not confusing museums of military history with war museums. In the former, the objects (especially arms) may be interpreted in contexts that are very narrow (technical, aesthetic) or very broad (cultural, social); but the interpretation should not include, as he feels it does in too many war museums, moral judgments that imply that the weapons themselves are somehow 'good' or 'bad'. Following Puype's essay is a list of military history museums compiled by Hacker and Vining, including no doubt several that step over the line, and also some with the word 'war' in the title that in fact make every effort to avoid such judgments.