Society of Antiquaries of Scotland

A Cromwellian Warship wrecked off Duart Castle, Mull, Scotland, in 1653

Colin Martin

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IN MEMORY OF THOSE WHO PERISHED, 13 SEPTEMBER 1653

for Paula
with love and gratitude

A Cromwellian Warship wrecked off Duart Castle, Mull, Scotland, in 1653

Colin J M Martin

James H Barrett, David Bate, Sue Black, Darren Cox, George Dalgleish, Peter Spencer Davies, Peter Ditchfield, Glenn Foard, Headland Archaeology Ltd, David Lamb, Ian MacLeod, John McManus, Wolfram Meier-Augenstein, Rachel L Parks, Andrew Ramsey, Janet Shelley, Theo Skinner, Catherine Smith and Lore Troalen

Jacket images by Colin Martin

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FOREWORD

The Hon Sir Lachlan Maclean of Duart and Morvern, Bt, CVO, DL
28th Chief of Clan Maclean

When in 1992 I was informed about the discovery of an unidentified shipwreck off Duart Point, I had no idea how long its exploration would take, or what a vast amount of information would be revealed by its remains. When the project really got off the ground in 1993 I was happy to do what I could to help. Colin Martin's base-camp was set up discreetly behind the tea-room and shop, and he and his team proved to be interesting and sympathetic neighbours. I was honoured to be invited to be the Patron of the project.

While many shipwrecks have no direct link with the shores on which they were wrecked, this one does. It was one of six vessels sent by Cromwell to land troops and attack Duart Castle in 1653, to quell a royalist uprising. But the clan chief and his entourage had fled. The troops and equipment were landed, but then a storm caused the wreck of three of the ships, and serious damage to the others. No harm was done to the Macleans or to Duart Castle. The expedition achieved nothing significant. Little did those men know, however, how much interest would be shown in the evidence surviving under water of them and their expedition three-and-a-half centuries later.

I am so pleased to see the published results of long study by Colin Martin and others, and to be asked to write this Foreword. Colin never boasted about the importance of the wreck. He worked slowly and carefully to extract the maximum amount of information from the material he was investigating, so that the remains could tell their own story. What those involved have uncovered, and the range of conclusions which they have drawn from the finds and their context, have spread wider than I ever could have imagined. The story of the wreck, the story of its excavation, and the stories the finds can tell, have added to the story of Duart Castle, and proved of great interest to many of our visitors from all over the world. I remember meeting Colin one day on the path as he returned from a dive on the wreck. He had with him, in a container of salt water, an oak twig with its leaves. How excited he was with this new find, as he was with everything they discovered on the wreck.

Illustration 1
Sir Lachlan Maclean, 28th Chief and Patron of the project, outside Duart Castle (DP 173655)

This book, the finds in the National Museum of Scotland, the little exhibition within Duart Castle, and the reburial of the human remains in the little graveyard beneath the castle walls, will all be a lasting legacy. Excavation stopped in 2003, though the site is still monitored to ensure its long-term stability, and there is an underwater trail for visiting divers. This project has involved many people, both divers and researchers, but the key figure all along has been Colin Martin. I have been proud to be Patron of such a well-run and interesting project, and very pleased that all their hard work has yielded such interesting and important results.

Duart Castle, *September 2015*

ACKNOWLEDGEMENTS

This project took 25 years to complete, and has involved the collaboration and support of many people and institutions. Grateful acknowledgement must first be made to the wreck's finder, John Dadd, for informing Historic Scotland of his discovery in 1991, generously waiving his claim to it, and following our subsequent investigations with friendly interest. I hope this monograph, and the permanent curation of the recoveries by National Museums Scotland, will be some recompense for his public-spirited actions. Warm thanks are also due to the Dumfries and Galloway Branch of the Scottish Sub-Aqua Club, whose members came upon the wreck in 1992, unaware that its existence was already known and that behind-the-scenes steps were being taken to give the site legal protection. It was they who reported the erosion which triggered the present project. They also recovered several vulnerable items, forgoing their right to a reward in favour of deposition in National Museums Scotland. One of their members, Donald MacKinnon, subsequently conducted the historical research which associated the wreck with the Cromwellian invasion of Mull in 1653. In addition the Club provided invaluable support during the monitoring and stabilising of the site over the critical winter of 1992 to 1993.

The late Martin Dean, then Head of the Archaeological Diving Unit at St Andrews University, brought his team to the wreck in 1991 and assessed it on behalf of Historic Scotland. Following his recommendation the site was designated as a Protected Historic Wreck. The following summer he directed the ADU's recovery and first-aid treatment of erosion-threatened artefacts, in conjunction with National Museums Scotland, the Dumfries and Galloway Club, and students and staff from St Andrews University. Martin then encouraged me to apply for a licence to continue monitoring the wreck, thus initiating the long-term investigation of which this report is the outcome. Over successive years he and his colleagues continued to visit the site in both their official and private capacities, and have supported the project in many ways, corporately and individually. In addition to Martin the ADU team has included Dave Burden, Dr Antony Firth, Annabel Wood (now Lawrence), Mark Lawrence, Steve Liscoe, Jon Moore, Ian Oxley, Duncan Simpson, and Kit Watson. Since 2003 monitoring has been continued by the ADU's successor, the diving team from Wessex Archaeology directed by Steve Webster and Graham Scott. During the preparation of this report Steve Liscoe has made available his extensive personal records and prodigious memory to correlate early activities on the site with the author's investigation. His perceptive observations have greatly aided our interpretation of the site-formation processes.

During the early stages Dr Robert Prescott of the Scottish Institute of Maritime Studies at St Andrews fostered the cross-institutional collaboration which has since characterised the project. Historic Scotland, as the agency responsible for Scotland's designated historic shipwrecks, has been a tower of strength throughout. In 1991 this responsibility had only recently been placed on the agency, and complex legal and administrative issues had yet to be resolved. Far from regarding these difficulties as an excuse for inaction, however, Historic Scotland saw the Duart Point wreck as a test-bed for establishing sound management policies for regulating and nurturing this important, but previously largely unrecognised, part of the nation's heritage. As a result of this experience, and other pioneering initiatives which it has fostered and supported, Historic Scotland has for two decades been a leading player in the development of effective strategies for managing the maritime cultural resource at both devolved-national and UK levels. Members of the agency with whom we have dealt include Dr Gordon Barclay, Professor David Breeze, Dr Andrew Burke, Deirdre Cameron, Ron Dalziel, Dr Noel Fojut, Olwyn Owen, Philip Robertson and Richard Welander. I thank them all for their support, encouragement, and good advice, much of which went far beyond the strict call of duty.

National Museums Scotland (NMS) have been similarly supportive and helpful from the outset. Dr David Caldwell, George Dalgleish, and the late Alan Saville have been generous with their time and expertise in the study of artefacts, while Tom Bryce, Dr Jim Tate, and Dr Theo Skinner, assisted by Stephanie Erpenbeck, have performed wonders in the

conservation laboratory. It is no reflection on his colleagues to single out Theo for special mention, for over the years he has carried out the bulk of this gargantuan task with consummate skill and patience, and in a spirit of collaboration which has maximised the information we have been able to extract from the objects before, during, and after conservation. Working with him in the lab and in the field has been an instructive delight. A particular triumph has been the three-dimensional computed tomography X-radiographic investigation of the pocket-watch conducted by Dr Andrew Ramsey and Dr David Bate of X-Tek Systems Ltd (today Nikon Metrology), supported by Theo and his colleagues Dr Lore Troalen and Darren Cox from the scientific and engineering conservation sections at the Museum. The finds are currently housed in the NMS store at Granton under the management of Jackie Moran, who has facilitated our study of the artefacts there with unfailing skill and good humour.

When I took on the project I had retired from active diving, and my earlier archaeological work under water had been conducted in the blissfully unregulated days between the late 1960s and early 1980s. By 1992 rigorous regulations for underwater work had been introduced by the Health and Safety Executive, so at 53 I was obliged to gain the necessary professional qualifications from scratch. This was arranged by my old friend and former diving colleague Lt Cdr Alan Bax, then Director of the Fort Bovisand Underwater Centre at Plymouth. If I thought he would give me an easy ride I was mistaken, for his instructors (mostly former Royal Marines) made no allowances for a recruit more than twice the average age of his fellow squaddies and put me through the mill with the rest. I hated them (and Alan) for it at the time, but it paid rich dividends later. I thank (and forgive) them all.

I have been especially fortunate in the colleagues with whom I have worked on the site. They are: Adrian Barak, Neil Dobson, Professor David Gregory, Jane Griffiths, Brian Hession, Annabel Lawrence, Mark Lawrence, Dr Ian MacLeod, Edward Martin, Peter Martin, Philip Robertson, Kevin Robinson, and Graham Scott. The project has profited from their skill and perception as archaeologists, and whether as diving buddies or surface supporters (the roles were interchangeable) each always inspired the confidence of the others. That 13 seasons of intensive diving were completed without serious incident or upset speaks for itself.

The only non-diving team member (though she has been a distinguished diving archaeologist in the past) is my wife and long-standing research colleague Dr Paula Martin. From the outset she has been an unfailing source of encouragement and support, and during the project's excavation phase she took on the tasks of deputy director and finds manager. Her abilities as a historian and archaeologist, her computing and administrative skills, her editorial acumen, and above all her wisdom and sound common sense, are attributes on which I have constantly relied and all too often taken for granted. I acknowledge them here now. Our son Edward, a professional photographer and digital specialist, has constantly and uncomplainingly been on hand to advise on and assist with photography, scanning and data management.

Behind-the-scenes support has been provided by the Research Grants Office at St Andrews, whose staff, through the good offices of Vice-Principal Professor Frank Quinault, guided us through the intricacies of financial management and fund-raising with patience and good humour. We owe special debts to Jimmy Bone, Ann Thom and Mary Clark. In the final phases of the project we enjoyed much practical support from the University's Development Office, especially from Jonathan Livingstone and Louise Taylor. Over the years the Bute Photographic Unit has cheerfully serviced my old-fashioned ideas about pen-and-paper approaches to archaeological illustration. In an age which increasingly relies on computer graphics its staff applied their traditional lithographic skills to deal with my often prodigiously sized line-drawings, and when they could no longer stem the advancing tide of technology they arranged to relocate their redundant process camera (a quarter-ton monster) in my home so that I could operate it myself. For advice and many kindnesses in these matters I am especially indebted to Jim Allen. The Royal Commission on the Ancient and Historical Monuments of Scotland (now Historic Environment Scotland) helped with the digitisation of large site-plans, a task undertaken by Edward Martin. The Royal Commission also facilitated the flights which enabled me to take the aerial photographs of the site and its environs, working in collaboration with Dave Cowley. The results owe much to the piloting skills of Ronnie Cowan.

For many seasons Ray Sutcliffe, formerly a producer with the much-missed BBC *Chronicle* programme, joined us in the field to co-ordinate the video coverage which now constitutes a valuable part of the project's archive. He shot most of the surface material, and taught us how to take usable footage under water. In 1999 our activities were filmed for the BBC 2 series *Journeys to the Bottom of the Sea*, directed by Sian Griffiths, and in 2002 Channel 4's *Wreck Detectives* sponsored two weeks of work on the site which resulted in another programme, directed by Peter Wyles. As a consequence of the latter production I was able to visit the *Vasa* Museum in Stockholm to examine comparative material, particularly the carvings, through the kindness of Klas Helmers.

The owner of Duart Castle, Sir Lachlan Maclean of Duart and Morvern, 28th Chief of the Clan, is directly descended from Sir Allan, the 19th Chief, whose castle our vessel came to attack in 1653. Sir Lachlan kindly agreed to be the project's Patron, and has generously supported us throughout. To him, his late wife Lady Mary Maclean, his mother the Lady Elizabeth Maclean, and their delightful family, we are indebted for many kindnesses and much practical help. We hope our long-term occupancy of a base-camp behind the castle, and the constant noise of our compressor on the rocks, did not

unduly discommode them or deter visitors. Warm thanks also go our many friends and supporters in Mull and Morvern, especially the late Allister Campbell and Susan Campbell, the late Bill Ackroyd and Janet Ackroyd, Ken and Jenny Masters, Chris James of Torosay, and Billy and Janice McGregor of the Craignure Inn. Nor do we forget the magnificent baking of the Duart tea-room girls.

Scott McAllister, master of the *Duchess* launch, which throughout our time at Duart brought parties of tourists from Oban to the castle twice daily, uncomplainingly made a wide detour around the site whenever our 'A' flag was flying, and on one occasion rescued our boat when it became detached from its moorings. We wish him well in his (semi-)retirement. The Marine and Coastguard Agency has been a constant ally. Our diving operations were conducted in constant radio contact with Oban (latterly Clyde) Coastguard, ensuring that help was always within immediate call. Confidence was boosted by the knowledge that we were only half-an-hour away from the recompression facilities at the Scottish Association for Marine Science at Dunstaffnage, and its availability in an emergency – happily never drawn upon – is gratefully acknowledged.

More than once (alerted by friends ashore) the prompt arrival of a high-speed Coastguard RIB deterred potential interlopers from diving on the site before any damage could be done. Such responses are now seldom necessary thanks to the scheme pioneered by Historic Scotland and Philip Robertson in conjunction with the Nautical Archaeology Society, which allowed responsible divers to visit the wreck by arrangement. This controlled access removed all sense of public exclusion, and engendered a protective attitude towards the wreck among local and visiting divers. Their support and goodwill has been, and remains, greatly appreciated. On 1 November 2013, the site was designated as a Historic Marine Protected Area, superseding protected status under the Protection of Wrecks Act (1973) (for more information see http://portal.historic-scotland.gov.uk/designation/HMPA7). As the site is considered stable and relatively robust, divers are now permitted to visit the wreck without a visitor licence on a 'look but don't touch' basis. The Lochaline Dive Centre* continues to keep a watchful eye over the site and offers educational tours on request. A visitor trail map and information sheet is downloadable from http://nauticalarchaeologysociety.org/duart-wreck-diver-trail ~~or http://www.lochalinedivecentre.co.uk/?page_id=1455.~~ *Centre now closed

The Receivers of Wreck with whom we have had dealings, notably Veronica Robbins and Sophia Exelby, have been outstandingly helpful in ensuring a smooth transfer of the recovered material to National Museums Scotland.

The valuable contributions made by various specialist scholars will be evident in their individually authored reports, but it is appropriate to acknowledge and thank them here. Professor Sue Black and her colleagues of the Anatomy and Forensic Anthropology Department at the University of Dundee have produced an extraordinarily detailed profile of the individual whose remains we recovered from the wreck, while Dr Wolfram Meier-Augenstein of Queen's University Belfast has been able to suggest, on the basis of isotope analysis, that he was probably a native of Yorkshire. Dr Peter Ditchfield of the Stable Isotope Laboratory at the University of Oxford (part of the Research Laboratory for Archaeology and the History of Art) has conducted further analysis which has cast light on the individual's dietary history. Dr Rachel Parks and Dr James Barrett, formerly of Fishlab at the University of York, have examined fish bones associated with the wreck and concluded that some may have been of local origin. Catherine Smith, of the Scottish Urban Archaeology Trust, carried out work on the animal bones and reached a similar conclusion. Samples of organic material from the ship's bilges were assessed by Headland Archaeology, and Janet Shelley of Duncan of Jordanstone College of Art, University of Dundee, examined the textile remains attached to a compass base.

Professor John McManus of the School of Geography and Geosciences at St Andrews investigated the ballast with unexpected and valuable results. Dr Ian MacLeod, recently retired as Executive Director, Fremantle Museums and Collections, in Western Australia, spent many hours under water and in the field laboratory pursuing his pioneering research on the in situ conservation of iron guns. He subsequently collaborated with Dr Theo Skinner in the analysis of the important John Browne cast-iron minion drake and later, when the composition of the metal yielded results of great significance to the history of early metallurgy, with Professor Hubert Preβlinger. Our collection of lead shot has been studied by Dr Glenn Foard of the University of Huddersfield, while the pewter has been investigated by George Dalgleish (National Museums Scotland), Dr Peter Davies and Dr David Lamb (Scottish Pewter Society). Dr Pieter van de Merwe of the National Maritime Museum has guided me through the mysteries of Stewart nautical iconography, and Professor Hugh Cheape of Sabhal Mor Ostaig, University of the Highlands and Islands, has kindly provided help with Gaelic words.

I am not by training a historian, and have relied heavily on others to research the history of the Duart Point ship and the circumstances of her wrecking. Unfortunately much of this has been misdirected by my early identification of the wreck as the pinnace *Swan* built for Charles I in 1641 (Martin 1995a: 25–8). Though this seemed so convincing at the time it has proved to be incorrect. For pointing out the error I am deeply indebted to Dr Patrick Little of University College London, who has shown unequivocally that the 1641 *Swan* survived beyond 1653. With great generosity Dr Little has made available his researches and extensive knowledge of the period in seeking to track down the true identity of the Duart wreck, and the evidence for this is set out below (Chapter 2.2). I also acknowledge the unpublished information kindly provided by

his colleague at UCL, Dr Andrew Thrush, whose unrivalled expertise on the evolution of small English warships during the 17th century I had already drawn upon, in published form, during my pursuit of the 'wrong' *Swan*.

Others upon whose goodwill I trespassed during the initial wild-*Swan* chase include Professor Jane Ohlmeyer of Trinity College Dublin, Dr John Crampsey of St Andrews University, and Gillian Hutchinson of the National Maritime Museum. Although in the event some of their researches have not proved directly relevant to the Duart Point wreck they have informed and widened my knowledge of small warships and their activities off western Britain during this crucial period, and for that I thank them warmly. Though it is too early to be certain, the possibility that the 'right' *Swan* may be a vessel of that name once owned by the Marquess of Argyll is opened up by a reference to this ship discovered by Alastair Campbell of Airds in the Inverary archives, and it is hoped that further research may throw more light on the matter.

Whatever the identity and origins of the ship, the circumstances of her loss are well documented and uncontroversial. The connection of the Duart Point wreck with the Cromwellian invasion of Mull in 1653 was first established by Donald MacKinnon, as acknowledged above. Much of the written source material has been calendared and published, but Dr Frances Henderson of Worcester College, Oxford, has generously allowed me to cite a previously unknown description of the incident which she has identified among the coded shorthand notes of the army secretary William Clarke, who was based in Edinburgh during the 1650s. Paul Dryburgh of The National Archives, Kew, and his colleagues very kindly checked a key word which had been transcribed differently by two scholars, and their adjudication has been invaluable.

Valuable information about *Swan's* captain, Edward Tarleton, was provided by Professor Bernard Capp of Warwick University. I am also grateful to Adam Tarleton who, though not a blood relative of Edward, has researched aspects of his career and generously communicated this information to me. Captain Christopher Tarleton Fagan, a direct descendant, kindly allowed me to photograph the portrait of Edward in his possession, and showed me important documents relevant to his ancestor's career. Joni L Davidson of San Francisco, who has conducted extensive research into the family, has generously made the fruits of her investigations available to me. We thank the National Trust for Scotland for granting permission to photograph the 17th-century plasterwork at the House of the Binns in West Lothian, and Tam and Kathleen Dalyell for their hospitality and kindness when we went there to do so.

Although underwater archaeology can be highly productive in terms of the information it yields it does not come cheap, and without the support of our sponsors little could have been achieved. The project would have died unborn in 1992 without a timely and extremely generous grant from the Russell Trust which allowed a full suite of diving and archaeological equipment to be assembled, a 4×4 vehicle obtained, and a field base established at Duart. This capital resource, together with an inflatable boat provided by Glenfiddich (William Grant & Sons Ltd), has sustained us through 13 field seasons and continues to support other research activities on the west of Scotland. Running-costs over the years have been provided by grants from Historic Scotland, National Museum Scotland, the Pilgrim Trust, the Esmée Fairbairn Charitable Trust, and Mr and Mrs Ellice B McDonald Jr. A major award by the Arts and Humanities Research Board, supplemented by further monies from Historic Scotland, sustained the excavation phase of the work from 1999 to its close in 2003. The Pilgrim Trust, the Russell Trust, the Thriplow Charitable Trust and the Arts and Humanities Research Board provided generous grants to assist with post-excavation work. During a visit to the site Drs Toni Carrell and Donald Keith of the Ships of Discovery program in the United States made a generous and unexpected contribution to the project. Honda UK lent us a quad bike which was invaluable during the setting-up phase of the excavation, while O'Three of Portland, Dorset, gave the project two of their unrivalled drysuits. That used by the writer is now in its 17th year of trouble-free service.

Final acknowledgement goes to the friendly and helpful editorial team at the Society of Antiquaries of Scotland, Erin Osborne-Martin, Catherine Aitken, Lawrie Law and Alison Rae.

EDITORIAL NOTES

There are some difficulties in structuring a report of this kind. Normally the identity of the wreck and its historical context would be set out first, but in this case the ship's name and origins are not certain, while its date – and consequently its likely historical associations – can only be derived from a critical assessment of the archaeological evidence, which is normally contained in the main body of a report. A summary of this evidence, and its likely interpretation, is therefore set out at an early stage. Then again, a consideration of the site-formation processes involved – an essential prerequisite to interpreting a wreck's archaeology – would most logically be explained as a prelude to a description of the excavation, yet these processes only become clear when the information derived from excavation has been assimilated. The excavation itself cannot be described without reference to the structural remains encountered, and this pre-empts the subsequent analysis of these remains in an attempt to reconstruct the basic attributes of the ship's dimensions, hull-form, and internal arrangements. The sequence of the report has therefore been ordered to accommodate these inconsistencies without compromising clarity or logic.

As will become clear, this ship's operational life and eventual demise is linked to the region's underlying historical dynamics and maritime geography, so an overview of these processes through time is presented by way of setting the scene (Chapter 1). The Cromwellian invasion of 1653, during which overwhelming evidence indicates that the ship was lost, is then analysed in detail, followed by the wrecking event and its aftermath. The circumstances of discovery, and how the project developed, are then presented (Chapter 2). This is followed by a summary of the archaeological and historical evidence for the wreck's date, probable identity, and historical context. Though much of the evidence is considered more fully in later sections, readers will want to know at an early stage the substance of this information. Questions of site management and research design are next addressed. Survey and excavation techniques are explained more fully than is usual in an excavation report, since not all readers will be familiar with the practicalities of applying archaeological procedures and standards under water.

The main body of the report begins with a description of the site's characteristics, recorded during the non-intrusive survey and assessment phase of the project (Chapter 3). This leads to an account of the subsequent partial excavation of the wreck, described sequentially from its aftermost remains to the forward surviving extent of the bow. A consideration of site-formation processes, based on this evidence, follows in Chapter 4. Chapter 5 describes the process of reconstructing the dimensions, body-lines, displacement, and structural characteristics of the hull. Chapter 6 considers the finds directly related to the ship and its working, from the ballast to the rigging.

Chapter 7 describes the ship's armament on its own terms and in terms of its disposition on the gun-deck. Because artefacts from a wreck represent a closed assemblage derived from a self-contained and largely self-sufficient specialised community, the remaining finds have been categorised by type or perceived usage rather than by material (Chapters 8 and 9). Chapter 10 presents the human remains and their interpretation. A final chapter considers the findings of the project in a wider historical perspective.

An Excavation Plan is included as a fold-out at the back of the book.

A number of other ships and shipwrecks are mentioned during the narrative. For ease of reference, and to avoid unnecessary repetition, those cited more than once to provide comparisons with the Duart Point Ship herself or with objects found on board are listed in Appendix 1.

Much of the archive of drawings and photographs has already been lodged with Historic Environment Scotland, and may be accessed online via the database Canmore, site 80637. Those interested in details of the diving operation, or aspects of the project such as the procedures developed for lifting delicate finds, can find much more detail there.

Units of measurement

All primary measurements involving general survey data, the dimensions of objects, and volumes follow metric conventions. Imperial English equivalents are given in brackets for

dimensions which may originally have been calibrated to these standards. Occasionally, usually when using figures from contemporary sources, the original measurement is used, with the metric equivalent in brackets.

Place-names

Place-names within quotations are as in the original. All other place-names have been standardised wherever possible to the spellings on modern Ordnance Survey maps.

Site grid

Maps and diagrams of above-water features are oriented northwards, but an exception has been made for the orientation of the wreck. Since the archaeological remains represent a hull lying partly on its side, it has been felt logical to present the wreck, as it were, 'right way up', and the local site-grid is adjusted to an arbitrary 'north' of 246° (T) and 'east' of 336° (T). This orientation is adopted in all the wreck-plans.

A metric grid has been superimposed on the site from an arbitrary point just beyond the most easterly identified archaeological deposit. Since the wreck is lying towards its port side the grid has been orientated so that the keel/keelson-axis lies towards the bottom of the coherent structure. The grid has a eastings component of 295° (T), running from **000.000** to **000.310**, and an northings one of 205° (T), running from **000.000** to **000.130**. Grid locations are given as 4- or 6-figure references, always eastings followed by northings. The crown of the anchor thus lies at **24.01** (within 1m square) or **240.015** (within 0.1m square).

Hull-axis and frame numbering

The observed axis of the keel runs from just aft of the mainmast step (**186.071**) to a point at or close to its forward end (**278.060**). The estimated position of the aft end of the keel, which may be presumed to lie below the limit to which the stern assembly was excavated, is at **096.075**. This position is 0.6m to starboard of an aftwards projection of the midships to forward keel-axis which, as argued elsewhere, indicates a probable break of the keel and keelson somewhere beneath the aft ballast-mound and a consequent displacement to starboard of the axial symmetry of the aft lower hull. This displacement however is relatively slight, and does not compromise an estimated keel length of 18.25m. The axis of the keel is the primary reference in Illus 60, and transverse structural features (mainly frame-timbers) are identified by their distances forward or aft of the master-frame (U), projected at right-angles from the axis line.

Technical terms

For precision and clarity, technical terms and their meanings employed in the text are those which would have been used and understood by a 17th-century seaman. The definitions in the Glossary are based primarily on John Smith's 1627 *A Sea Grammar* and Henry Mainwaring's *The Seaman's Dictionary*, which, though not published until 1644, is believed to have been prepared in manuscript by 1617 (Manwaring and Perrin 1923: 3). Where appropriate William Falconer's magisterial *Universal Dictionary of the Marine* (first published in 1769) has also been consulted.

Finds numbers

The core system used was a simple numerical sequence of three digits prefixed by DP (for Duart Point) and the final two digits of the calendar year and a / (for example DP01/037). However, in 1997 a more complex system was used, involving separate numerical sequences depending on the context (A, C or E). This used 4 final digits, but as the highest number reached was 0051 these have been reduced to 3 digits for consistency with other years. The finds from 1992 were originally given simple numerical sequences, one by the ADU and one by members of the Dumfries and Galloway Club. These have been retrospectively standardised to the format DP92/001 and DP92/DG01. Three items found by John Dadd which have been recorded have been retrospectively numbered DP79/001–003.

Catalogue numbers

For ease of cross-reference within the text and illustrations, finds have been assigned catalogue numbers. For simplicity and clarity, catalogue numbers (boxed to distinguish them from other numbers, eg 1) consist of one sequence running through Chapters 5–9. They are also used to identify individual finds elsewhere in the text where appropriate, and in illustrations and captions.