

Collections, information and computers in the National Museums of Scotland

John Burnett*

INTRODUCTION

We were a tribe, a family, a people.
Wallace and Bruce guard now a painted field
And all may read the folio of our fable,
Peruse the sword, the sceptre and the shield.
Edwin Muir, 'Scotland 1941'

'The folio of our fable' includes books, buildings, manuscripts, artefacts, scientific specimens and the changed and changing landscape. Even if we consider only objects in museums, the range and diversity of the material is daunting. How, then, does the reader find the desired paragraph in the folio? For the future, the answer is – with a computer. When Rabelais had Pantagruel send his father three young unicorns and a tapestry showing the deeds of Achilles, and promised further rarities, he was making manageable contributions to a typical 16th-century collection. Approaching the millennium, museum collections are vastly larger and more various, and the volume of information concerning them justifies the application of computer technology on a large scale.

The purpose of this article is to present some of the history of collecting, and the consequent handling of information, in the National Museums of Scotland, and to suggest some likely developments in the handling of cultural information which will be made possible by the computer. Throughout the paper, the emphasis is on the artefacts in the Museums' collections rather than on the biological and geological material.

MUSEUM DOCUMENTATION

There are two aspects to the documentation of collections in museums. First, there is the scholarly description of each item, and the analysis of its historical significance. This activity ('cataloguing') may culminate in the presentation of a paper or the publication of a printed catalogue.

Cataloguing can be extremely time-consuming. This is true whether the catalogue is produced to complement a special exhibition, such as the National Museum of Antiquities' 'Symbols of Power' (Clarke, Cowie & Foxon 1985), which was selective and drew on material

* Department of Museum Services, Royal Museum of Scotland, Chambers Street, Edinburgh

from several museums, or is the catalogue of a clearly defined group of objects which have a typological or historical relationship with one another. An example of the latter is R G W Anderson's scholarly discussion of the early chemical apparatus which was presented to the Edinburgh Industrial Museum – as it then was – by the University of Edinburgh in 1858 (Anderson 1978).

The second type of documentary work, which has hitherto been less public, is that carried out by a museum's curators and comprises the itemizing and indexing of collections so that any curious individual can find out what the museum holds. This kind of museum documentation needs only a short record for each object. Its essential feature is that the record can be found efficiently, that is without having to search through hundreds or thousands of records by hand. The ideal record for this purpose is one which states clearly what the object is, where it came from, and if necessary gives limited contextual information to explain its interest. The purpose of this kind of documentation is normally to enable museum staff to work with their collections by providing in each record a description which can be found by specifying one or more criteria, for example type of object, provenance, donor or storage location.

The existence of short and accurate records is only the first stage: it is also necessary to have a means of finding the information required to answer a question. The maintenance of full card indexes in a large museum is such a laborious task that it has been done only under unusual circumstances, such as in the Field Museum of Natural History in Chicago, where a large clerical team was available during the Great Depression.

The key to the problem of finding information is modern computer technology – indeed, it is tempting to regard the documentation of museum collections as being a problem which has been waiting for two centuries for the development of the computer.

MUSEUM DOCUMENTATION BEFORE 1850

The functions which have been performed by documentation in museums since the Renaissance are as various as the functions of the museums themselves: catalogues may further research, may be available for sale, and may reflect on the supposed personal or national prestige of their owners. The kind of collection which was formed by the Society of Antiquaries of Scotland had been anticipated in Italy in the latter part of the 16th century. Individuals such as Ulisse Aldrovandi of Bologna assembled collections which concentrated on a single subject, and were intended for study and teaching. In having a semi-public role they were different from the semi-private and highly personal *studioli* of princes and aristocrats (Olm 1985). Aldrovandi's particular interest was natural history, and he published a series of books which illustrated his specimens, emphasising the fact that he wished his collections to be known to the public. There are many other examples which show this function of documentation. John Tradescant said that one of the motives in publishing the catalogue of the collection formed by his father and himself, the *Musaeum Tradescantium* (1656), was that it would be 'an honour to our Nation' (Leith-Ross 1984, 231). The publication by the Royal Society of London of Nehemiah Grew's *Museum Regalis Societatis* (1681) contributed to the international esteem in which the Society, then only 20 years old, was held (Simpson 1984).

Other kinds of lists included inventories of some collections, particularly those belonging to individuals rather than to learned societies and universities. An early example of the numbering of individual items, demonstrating the intention to exercise close control over an

inventory, was in the Royal collection in Copenhagen, between 1765 and 1775 (Gundstrup 1985, 132). The oldest documentation of a collection which has subsequently found its way into the National Museums of Scotland is James Sutherland's manuscript catalogue of his coins and medals, compiled at the beginning of the 18th century (Brown 1989). The document was practical, and included a list of items which Sutherland hoped to acquire, a practice subsequently followed by the Society of Antiquaries, who also listed their duplicates as 'a fund for barter' (SAS 1820).

COLLECTIONS AND DOCUMENTATION IN THE NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND

The complex history of the growth of the collections of the Society of Antiquaries of Scotland from its founding in 1780 has been written by R B K Stevenson (Stevenson 1981). Lists of donations (including books, and starting with £20 from the Earl of Buchan) were published in Smellie's early account of the Society (Smellie 1792), and subsequently in *Archaeologia Scotica* and, until 1985, in the Society's *Proceedings*. There have been significant disposals from time to time, including the transfer of objects to other museums. The lists can also be used to follow changes in the collecting policies. The history of the numismatic collections, some of which can be traced back to James Sutherland in the 17th century (Stevenson 1966, xxv–xxvii), is particularly confused (Stevenson 1981, 42, 176), and at present a numismatist is employed to consolidate the existing documentation and re-catalogue the collection.

Since the Antiquaries' Museum was intended for research, the disposition of the objects on the shelves and in the cases was important as it controlled the possibilities for making comparisons. When the Museum was moved from one site to another – from George Street to the Royal Institution, and from there to Queen Street – laying out the objects was a highly responsible task (Stevenson 1981, 147). The nature of the labelling is unknown, but it was probably limited. It was common for most of the 19th century for visitors to be conducted round museums, as when William Makepeace Thackeray was guided through the collections of Trinity College, Dublin, by a porter, and saw 'cheap old gimcracks' and heard 'their corollary of lies'.

The first attempt to provide users of the Museum with information about the collections was a *Synopsis* prepared by Daniel Wilson in 1849 (Stevenson 1981, 79–80). It indicated the more important items, illustrated a few of them, and explained their historical context. It was followed in 1863 by a more limited version (Stevenson 1981, 147) and by two catalogues of the Scottish collections (lists which included provenances but no contextual explanation) in 1876 and 1892. The latter, in particular, is a marvel of condensation.

The issue of the classification of the collections became a matter of discussion as the number of objects increased. A H Rhind was concerned with classification as early as 1851 (Stuart 1874), and the 1863 catalogue can be seen as an outline for future developments (Stevenson 1981, 147). It was, however, Joseph Anderson who created an analytical system for organizing the collections. He saw that systematic study was the starting point for bringing apparently disparate material under control, and that systematic organization was the technique to be deployed (Graham 1976, 287–8).

Closely related to the question of classification is the numbering of individual objects, so that they can be unambiguously related to documentation. Wilson's *Synopsis* gives no indication of a numbering system (Wilson 1849), but the 1876 catalogue, for which Anderson

was responsible, includes numbers for groups of objects, although some of these groups were unmanageably large. For example, under the very broad heading ‘Collections from Pictish Towers or brochs, Weems, Underground dwellings, hut circles, kitchen middens, &c’ are listed:

- 80. The Tappock, Torwood, Stirlingshire
- 81. Skail, Orkney
- 82. Deerness
- 83. Broch of Burray (SAS 1876)

Individual items are not distinguished. At this period it was still the practice to write details of provenance on the more robust objects, such as stone axes – ‘Sutherland Lawson Tait 1867’ (X.AF 19); ‘Wigtownshire Lord Stair 1877’ (X.AF 34), suggesting that items still did not have unique numbers.

The 1892 catalogue set out a new system for classification which Anderson had developed. It started with the Stone Age and moved forward in time. The classification consisted of a series of two-letter codes, beginning:

- AA Knives and knife-like implements of flint
- AB Scrapers, cores, flakes, &c, of flint
- AC Implements of roughly-chipped stone other than flint
- AD Flint arrow and spear heads

Individual objects were then given a running number within one of these categories. The system has worked well for a century, and has been extended to cater for a far greater range and quantity of historical material than was present in Anderson’s time.

Although Anderson’s classification system was fully revealed in 1892 (NMA 1892), its intellectual origins are unknown. From the limited evidence available, it appears to have been prepared in 1886–7. The 1892 catalogue lists the most recent acquisitions in each category in order of acquisition – implying that they were entered in the list as they arrived in the Museum – but the earlier acquisitions (before 1886–7) are in an order which has nothing to do with the date on which they came to the Museum. This catalogue was the model for the listing of a substantial and varied private collection at Thornhill, Dumfriesshire (Black & Bisset, 1894). The 1892 catalogue gave only a very brief description of each item, and two more detailed lists were published elsewhere (Black 1890 & 1894).

Anderson understood the value of the published catalogue. After a visit to the Continent he boasted:

Ours is still the only national collection of its kind which has attempted to supply its visitors with a detailed catalogue, by means of which they are enabled to ascertain for themselves the nature, the history, and the assignable place in the classified series of every object exhibited (Anderson 1883, 38).

This comment was made in the light of the 1876 catalogue. Anderson must surely have been even more satisfied by its successor in 1892 (NMA 1892). One of its particular strengths was that despite being priced at a shilling it was extensively illustrated. This was possible because of the close link between the Society and the Museum – the blocks used for the catalogue had already been used for the *Proceedings*. A reviewer used this point to bemoan the absence of a similar tie between the Society of Antiquaries and the British Museum, and the latter’s failure to issue a catalogue of its English antiquities (Allen 1893).

The 1892 catalogue is a structured list which is not accompanied by indexes of place or

other names: this is its only serious fault. However, the close relationship between the Society and the Museum made it possible (and it is still possible) to trace material through the Society's *Proceedings*. This is reasonably practicable because of the excellent cumulative indexes which cover successively the periods up to 1889, 1914, 1947 and 1974. The 1889 cumulation was particularly detailed. Its successor appeared 22 years after the end of the period it indexed, with an apology:

But it was not only the proper names that were to be scrupulously entered. The same rule was to apply to every object mentioned in any of the papers, and these were to be entered, not merely individually, but also under the localities to which they belonged. Finally, the localities themselves were to be grouped under counties. In process of compilation the work passed through several hands, and the plan was elaborated at various points . . . innumerable cross-references were found to be desirable. In the end the scheme collapsed under its own weight (SAS 1936, iii).

This is, unwittingly, a statement of the need for a computer to provide access to a large body of complex information without requiring an excessive quantity of labour.

COLLECTIONS AND DOCUMENTATION IN THE ROYAL SCOTTISH MUSEUM

The Industrial Museum of Scotland was founded in 1854, one of a group of institutions, including the South Kensington Museum and the reformed Museum of Irish Industry, which owes its existence to the success of the Great Exhibition of 1851. The most adequate history of the museum in Chambers Street is still that issued on its centenary (RSM 1954), though its development in the 19th century has been described in outline (Calder 1984).

Whereas the Museum of Antiquities was established as an institution for research, the Industrial Museum was intended to be an instrument of public instruction (Anderson 1989). It functioned as a part of the Civil Service in the Science and Art Department. Its administrative position led to links with other museums in the same Department. This was clearly illustrated when objects were lent to Edinburgh by the South Kensington Museum, such as on the occasion of the opening of the second part of the original building in 1875:

'Some men came doon frae Kensington, and lots o' stuff brought wi' them
Such ugly casts they did appear, it was a shame to see them;
But faith when they were a' set up they looked sae very bonny,
That the London men great credit got at the *Conversazione*.'
(Milne 1875)

In the first few years collecting emphasised raw materials, industrial processes, and products – in short, material which was seen as having economic importance. The first Director wrote of the Museum during a trade slump as 'a tower of refuge in commercial storms, and a castle stored with the ammunition and the weapons of commercial warfare' (Wilson 1857, 9). The subsequent growth of the collections was dependent to an extent on the changing tastes of the staff. Thomas Archer, Director from 1860 to 1885, continued to develop the technical collections until after a tour of the Continent he could boast 'that as a Technical Museum [it] is inferior to none in Europe' (EMS&A 1874). In the last ten years of his directorate the emphasis shifted to collecting in the decorative arts. Similar changes in South Kensington are likely to have influenced collecting policies in Edinburgh.

The Museum inherited extensive natural history collections and some ethnographic material from the University. These collections grew rapidly and soon included the skeleton of

the Blue Whale which had been washed up at North Berwick in 1831 and dissected by Robert Knox (Z.1864.049). Large numbers of objects were being acquired from outside Europe. Many significant donations were made by Scots who were at work in the Empire, such as Sir Harry Johnson of the Niger Company and David Livingstone. Sir Robert Murdoch Smith, Director from 1885 to 1900, who had worked for twenty years as a telegraph engineer in Persia, was responsible for the acquisition of many objects from that area (Scarce 1986).

From the beginning, as befits a government organization, a ledger of acquisitions was maintained, a prosaic document which makes a study of the history of collecting much simpler. In their survey of museums in Scotland in 1888, Joseph Anderson and G F Black noted that Kirkcudbright had an acquisitions register (Anderson & Black 1888). It was probably the only museum other than the Edinburgh Museum of Science and Art (as it had been renamed in 1864) which maintained one.

A number of catalogues of the Museum's collections were published by the Department of Science and Art. These included the Industrial Department (including decorative arts) in 1867; the Mineral collection in 1870 (5th edn 1910); the Natural History Department in 1872; and Scottish geology in 1892 (6th edn 1912). These early catalogues were ambiguous in their approach: while they do not contain enough information to satisfy the specialist, their astringency is too much for all but the most earnest autodidact. Perhaps university students were their real market. A particular problem in using early catalogues published by museums is that although they are often well organized, they usually lack indexes. A notable exception was the index to the Mineral collection (Archer 1871).

After the First World War, the Royal Scottish Museum ceased to issue catalogues. Scholarly material was from time to time incorporated in periodical literature (Waterston 1953). In 1970, however, the Royal Scottish Museum Information Series, devised by Dr Charles Waterston, then Keeper of Geology, was inaugurated with the first part of a catalogue of fossil vertebrates, and it was followed by a number of similar catalogues of specific areas of the collections, published cheaply. Since 1985 it has been superseded by the similar National Museums of Scotland Information Series.

The Scottish United Services Museum, founded in 1930 and incorporated in the Royal Scottish Museum in 1954, has never published a catalogue. Its collections' documentation, however, is well organised. This reflects half a century's curation by retired army officers who were used to reading quartermasters' concise descriptions of stores written in a consistent vocabulary. In interpreting the collection, the emphasis is now on social rather than military history. The flexibility of the database enables the curator to locate items which may be of interest for a number of reasons, social or military: 'M.1931.93: Housewife presented to all ranks by the King and Queen of the Belgians'.

The present sizes of the NMS collections, in thousands of items, are:

Archaeology	500
Armed Forces History	27
Geology	170
History and Applied Art	120
Natural History	3000
Science, Technology and Working Life	30

Fortunately, a smaller number of records is needed to produce a working database, for two reasons. First, several similar archaeological finds from a single site can be represented by a single record. Second, the storage of most of the zoological specimens according to the

Linnean system makes it possible to locate and manage them without recourse to a listing of each item.

MUSEUM AUTOMATION

Before the amalgamation in 1985 of the Royal Scottish Museum and the National Museum of Antiquities to form the National Museums of Scotland, the decision was taken to create a computerized list of the collections (Anderson 1986). Although the benefits in saving staff time, and in creating opportunities for research, were obvious, the main reason for funding being allocated to such a large project was the need to demonstrate that the Museum could account for collections which it holds on behalf of the nation. This is a manifestation of a general concern of the National Audit Office and the Public Accounts Committee of the House of Commons that the national museums should keep accurate inventories of their holdings, and subject them to proper stocktaking procedures (Roberts 1985, 12–14).

The building of the National Museums' database began in October 1987 with the input of a record for a flint dagger from Nunraw, East Lothian (X.AA 1), which had been acquired by the Museum of Antiquities in 1874. By the end of 1988 over 100,000 records – almost all of those for the Archaeology Department – had been input. During 1989 all of the records for the Scottish United Services Museum and the Working Life section were added, plus a significant part of the Scottish Historical collections. The computerization of the database for the Scottish Historical collections will be completed in 1992, as will be the records for the Science and Technology sections. By the end of 1991 the computer also held some 25,000 records for the Natural History collections, 15,000 for the Geology Department, and 15,000 for the Chambers Street collections of the Department of History and Applied Arts. At the time of writing (Feb 1992), 352,000 records had been input.

Before computerization the numbering systems used by the different departments were similar, if not identical to one another. To avoid confusion the following prefixes have been added to existing numbers:

Archaeology	X
Armed Forces History	M
Geology	G
History and Applied Arts	
Chambers Street	A
Queen Street	H
Natural History	Z
Science, Technology and Working Life	
Science and Technology	T
Working Life	W

With computerized indexing it becomes possible to undertake information searches which have not in the past been practicable. An object can be in only one of the Museums' collections, though it may be of interest in several contexts. For example, the majority of the bagpiping material is in the Department of History and Applied Arts, but there are significant holdings in the Department of Armed Forces History, including medals won by that great composer, Pipe-Major George S Maclellan of the Gordon Highlanders (M.1930.1015 etc). Arms were acquired by the SUSM because they had a military context, by the NMAS because they were Scottish, or the RSM on account of their being examples of decorative metalwork,

and costume was similarly to be found in all three museums. The benefits of being able to examine at once the information relating to all three collections is obvious. Specimens of the Great Auk, extinct since 1840, are rare, but are found in both the Natural History (Z.1819.004, a pair of eggs), and Archaeology collections (X.GJ 86,88,89, bones from Keiss, Caithness). In order to make this kind of interdisciplinary searching possible, standardized terminology is important (Burnett 1990a).

For studies of local history, it may be useful to list the collections from a particular locality. A search for objects associated with Haddington, for example, yields a case which contains eight types of wheat grown in 1884 near Haddington for comparison (W.1972.112), a wooden washing machine from a house in Hardgate (W.1957.971), a Standard Winchester Bushel of 1770 (W.VH 24), a wine-glass inscribed 'God save the King / God bliss the Prince of Wales / 1716' (A.MEN 3), two photographs of the Lothians and Border Horsé at Amisfield camp in 1914/15 (M.1974.17), as well as a variety of archaeological material.

A particular problem, namely the presence of outmoded terminology, arises because of the considerable antiquity of much of the documentation. Since identification and description are constantly changing, it has been decided to maintain in perpetuity the first or oldest available written record, and to keep separately a modern statement (Burnett & Clarke 1989). This is an important issue for archaeological collections, since name, interpretation and theory are all linked. At the other extreme, naming in the Scottish United Services Museum has always been disciplined. The age of records can produce another kind of problem – the use of words such as 'kaffir' or 'eskimo' which are now regarded as unacceptable (McCorry 1991).

This is not the place for a detailed description of the computer software and hardware employed, but in summary, Minisis, a relational database package produced by the Canadian government's International Development Resources Center, has been running in NMS since 1987. It is in use in a dozen museums in the United States of America, as well as in the National Galleries of Scotland, the Ulster Museum and the Rijksmuseum in Amsterdam. From the beginning, a Hewlett-Packard 3000 series 52 minicomputer was used, and it was upgraded to series 925 in 1990 and to series 947 in 1992. An extensive telecommunications network includes the buildings in Chambers Street, Queen Street and the Scottish United Services Museum. Advice on technical and other issues has been taken from two consultants – William McQuillan of Glasgow and Willoughby Associates of Chicago – and successful relationships with them have been an important part of the automation project.

The National Museums have a role in giving advice and support in documentation and automation to other museums in Scotland through the Scottish Museums Documentation Officer, a member of the staff of the Documentation Unit. This work is done in liaison with the Scottish Museums Council. A booklet has been published which gives a practical basis for dealing with modern documentation problems (Burnett & Morrison 1991).

THE FUTURE

If it is difficult to predict the development of an organization, it is doubly difficult in a context which involves the rapidly moving world of information technology. It is possible, however, to indicate in outline five possibilities for the future:

NATIONAL DATABASES OF MUSEUM COLLECTIONS

The idea of drawing together information on the holdings of all of the museums in Scotland is not new (Burnett 1990b). In 1888 Joseph Anderson and G F Black filled ninety

pages of the *Proceedings* with a list of archaeological and historical objects in a number of museums, including some material in private hands (Anderson & Black 1888). Information technology, however, may make it possible to create genuine national databases for various subjects in the foreseeable future. Moving data from one computer to another is now technically quite easy. The creation of national databases depends on the creation of computer records in many museums. It has been estimated that the total number of objects in museums in Scotland is 14 million and that to describe them adequately will require four million records. The first museum in Scotland to begin the automation of its documentation was the Hunterian Museum in the University of Glasgow (MacKie 1980), and now just over one hundred museums have computers.

Although the National Museums have been inputting 80,000 records each year, the total figure for all of the other museums is only about 30,000 per year. At this rate, it would be several decades before something approaching a national database emerged. However, there is evidence that the rate of input is increasing.

OTHER DATABASES IN SCOTLAND

Creation of databases is being carried out by Historic Scotland, the Royal Commission on the Ancient and Historic Monuments of Scotland, the National Galleries of Scotland, and the National Library of Scotland. At some time the historical material in the Scottish Record Office will surely receive similar treatment. The possibility of linking these databases already exists and as time passes the increasing quantity of data will make it more and more worthwhile.

HANDLING IMAGES

Computer databases in museums have until recently stored text rather than images. There are now no technical barriers to holding and presenting good-quality images of museum objects on a computer screen. The difficulty is that it is still essential to use the skill of a photographer to create a good, clear image. In time, banks of images will be built up, and it will be possible to transfer visual as well as textual information from one computer to another.

INFORMATION SERVICES FOR THE PUBLIC

Information concerning the Museums' collections is, of course, public property, and should be available to all. Information technology provides many opportunities for presenting information in new ways. In 'The Wealth of a Nation', the Museums' major exhibition of 1989, a computer was provided which enabled the visitor to select a location in Scotland, and learn about objects from that location either in the exhibition or in the rest of the museum (Buchanan & Burnett 1990). Subsequently computer presentations have been prepared which deal with the manufacture of stone and bronze axes, the scientific analysis of museum objects, and the history of the Royal House of Stewart. In each case the content has been prepared by the Museums' Education Section, and the programs written by the Documentation Unit. The presentations dealt with small numbers of objects (the largest listed 200), and most contained more interpretative text than description. Public access to larger groups of objects is now being planned.

THE MUSEUM OF SCOTLAND INFORMATION & RESEARCH CENTRE

The plans for the new Museum of Scotland include an area in which visitors will be able to have access to a range of databases, books and reference material which will enable them to find out more about the collections and their contexts. Ideas are being formulated by focusing on the information needs of inquisitive minds, rather than on what computers can do.

AFTERWORD

The opportunities for deploying information technology in museums are enormous and exciting. The real issues, however, are not the computers or the databases, but the information they contain and the possibilities for giving more people a better understanding of the collections. Scotland is the right size to develop projects such as those outlined above, most similar developments being found in countries of a similar size such as Denmark and Switzerland.

Lewis Mumford has used the metaphor of the modern city for the modern museum, stressing its tendency to over-expansion and disorganization (Mumford 1966, 639). Mumford also praised the New Town of Edinburgh for its order and unity, arguing that it stemmed from a unified attitude to life as well as unified control of architects and builders (*ibid* 455). It is perhaps too much to expect museum staff to persuade the population of Scotland to adopt a shared view of the world, but computerization of the information in museums does at least enable curators and scholars to re-establish their own perspectives on the pattern of life in Scotland.

ACCESS TO INFORMATION

Fellows of the Society who are seeking information concerning the Museums' holdings are asked to write to the Keeper of the curatorial department which handles the material in which they are interested, or to the Documentation Unit for more general enquiries. The data which can be supplied include many records created in the 19th century, which are not always either accurate or full, and their terminology is often outmoded. Fellows should be aware that until about 1997 the Museum of Scotland project will take up much of the time of the Museums' staff, and may limit their ability to answer enquiries. Important acquisitions are described in the Museums' *Annual Report*.

Computer printout listing recent acquisitions has been placed in the three sites of the National Museums' Library where it is accessible to Fellows and the general public. The Library is also carrying through an automation programme, and the database listing all of its holdings, including recent acquisitions, will be available to all by 1993.

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REFERENCES

- Allen, J R 1893 'The Edinburgh Museum', *The Illustrated Archaeologist*, 1 (1893-4), 61-3.
- Anderson, J 1883 'Notes on some continental museums in France, Germany and Belgium', *Proc Soc Antiq Scot*, 18 (1883-4), 36-48.
- Anderson, J & Black, G F 1888 'Reports on local museums in Scotland', *Proc Soc Antiq Scot*, 22 (1887-8), 331-422.
- Anderson, R G W 1978 *The Playfair Collection and the teaching of chemistry at the University of Edinburgh 1713-1858*. Edinburgh.
- Anderson, R G W 1986 'A new start for the Nationals', *Museums Journal*, 86 (1986-7), 3-6.
- Anderson, R G W 1989 'Scotland's history in the National Museums of Scotland', in Ambrose, T (ed), *Presenting Scotland's story*. Edinburgh, 65-73.
- Archer, T C 1871 *Edinburgh Museum of Science and Art: Natural History Department: Analytical index of the mineral collection*. Edinburgh.
- Bell, A S 1981 *The Scottish antiquarian tradition: essays to mark the bicentenary of the Society of Antiquaries of Scotland and its Museum, 1780-1980*. Edinburgh.
- Black, G F 1890 'Notice of antiquities, found in Dumfriesshire, and now preserved in the National Museum in Edinburgh', *Trans Dumfriesshire Galloway Natur Hist Antiq Soc*, 6 (1887-90), 207-14; 8 (1891-2), 91-101.
- Black, G F 1894 'Descriptive catalogue of the antiquities found in Ayrshire, and now in the National Museum, Edinburgh', *Archaeological and Historical Collections relating to Ayrshire and Galloway*, 7 (1894), 1-47.
- Black, G F & Bisset, J 1894 *Catalogue of Dr Grierson's Museum, Thornhill*.
- Brown, I G 1989 'This old magazine of antiquities: the Advocates' Library as a National Museum', in Cadell, P & Matheson, A (eds), *For the encouragement of learning: Scotland's National Library 1689-1989*, Edinburgh, 149-85.
- Buchanan, A & Burnett, J 1990 'Where have you come from? Where are you going?' *Mus J*, 90 (8), August 1990, 28.
- Burnett, J 1990a 'Some aspects of a strategy for terminology control in the National Museums of Scotland', in Roberts D A (ed), *Terminology for Museums*, 89-94.
- Burnett, J 1990b 'National collections of objects and museum information in 19th-century Scotland', *Museum Management and Curatorship*, 9 (1990), 281-5.
- Burnett, J & Clarke, D V 1989 'The role of older descriptions and identifications of objects in a museum database', *Int J Museum Manage Curatorship*, 8 (1989), 431-4.
- Burnett, J & Morrison, I O 1991 *Wimps, worms and winchesters: a guide to museum documentation*. Edinburgh. 2nd edn (National Museums of Scotland Information Series, no. 14).
- Calder, J 1984 *The Royal Scottish Museum: the early years*. Edinburgh.
- Clarke, D V, Cowie, T & Foxon, A 1985 *Symbols of power at the time of Stonehenge*. Edinburgh.
- EMS&A 1874 *Edinburgh Museum of Science and Art Report on the condition and progress of the Edinburgh Museum of science and art for 1873*. London.
- Graham, A 1976 'The archaeology of Joseph Anderson', *Proc Soc Antiq Scot*, 107 (1975-6), 279-98.
- Gundstrup, B 1985 'From the Royal *Kunstkammer* to the Modern Museums of Copenhagen' in Impey O & MacGregor A, 128-35.
- Impey, O & MacGregor, A 1985 *The origin of museums: the cabinets of curiosities in sixteenth- and seventeenth-century Europe*. Oxford.
- Leith-Ross, P 1984 *The John Tradescants: gardeners to the Rose and Lily Queen*. London.
- McCorry, H C 1991 'Bad language in ethnography records', *Int J Museum Manage Curatorship*, 10 (1991), 433-4.
- MacKie, E 1980 'Using the MDA cards in the Hunterian Museum', *Mus J* 80 (1980), 86-8.
- Milne, D [1875] *The Conversazione*. Single sheet, copy in the library of the National Museums of Scotland.
- Mumford, L 1966 *The City in History*. Harmondsworth.
- NMAS 1892 *Catalogue of the National Museum of Antiquities*. Edinburgh.
- Olmi, G 1985 'Science-Honour-Metaphor: Italian cabinets of the sixteenth and seventeenth centuries', in Impey O & MacGregor A, 1985, 5-16.
- Roberts, D A 1985 *Planning the documentation of museum collections*. Duxford.

- RSM 1954 *The Royal Scottish Museum 1854–1954*. Edinburgh.
- SAS 1820 ‘Catalogue of the Scottish coins belonging to the Society of Antiquaries of Scotland’, *Archaeologia Scotica*, 2 (1822), appendix, 7–32.
- SAS 1876 Society of Antiquaries of Scotland. *Catalogue of antiquities in the National Museum*. Edinburgh.
- SAS 1936 *General Index to the Proceedings of the Society of Antiquaries of Scotland vols. XXV–XLVIII*. Edinburgh.
- Scarce, J 1986 ‘Persian art through the eyes of Major-General Robert Murdoch Smith KCMG’, in Calder, J (ed), *The Enterprising Scot*. Edinburgh, 131–9.
- Simpson, A D C 1982 ‘Sir Robert Sibbald – founder of the College’, in *Proceedings of the Royal College of Physicians Tercentenary Congress 1981*, Edinburgh, 59–91.
- Simpson, A D C 1984 ‘Newton’s telescope and the cataloguing of the Royal Society’s repository’, *Notes and Records of the Royal Society of London*, 38 (1984), 187–214.
- Smellie, W 1792 *Account of the institution and progress of the Society of Antiquaries of Scotland*. Edinburgh.
- Stevenson, R B K 1966 *Sylloge of the coins of the British Isles: National Museum of Antiquities of Scotland. Part I: Anglo-Saxon coins (with associated foreign coins)*. London.
- Stevenson, R B K 1981 ‘The Museum, its beginnings and its development’, in Bell, A S, 31–85, 142–211.
- Stuart, J 1874 [Speech on presenting a portrait of A H Rhind], *Proc Soc Antiq Scot*, 11 (1874–6), 10–1.
- Waterston, C D 1953 ‘Catalogue of type and figured specimens of fossil fishes and amphibians in the Royal Scottish Museum, Edinburgh’, *Trans Edinburgh Geol Soc*, 16 (1953–4), i–x, 1–91.
- Wilson, D 1849 *Synopsis of the Museum of the Society of Antiquaries of Scotland*. Edinburgh.
- Wilson, G 1857 *The Industrial Museum of Scotland in relation to commercial enterprise*. Edinburgh.