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National Museum of Antiquities of Scotland

MUSEUM AUTOMATION

The Report of a Working Party.

April 25th, 1984

The Director of the National Museum of Antiquities of Scotland set up a Working Party to advise on the appropriateness of computers as tools in the work of the Museum and, if they were found to be appropriate, to make recommendations for the development of their use.

When the report was written, the composition of the Working Party was:—

Professor L.Alcock,

Dr.D.Clarke (Deputy Director of the Museum)

Mr.T.Cowie (Museum staff)

Mr.G.Dalgleish (Museum staff)

Professor D.Harding,

Professor S.Michaelson, Convenor

Dr.J.Shaw (Museum staff)

Dr.J.Tate (Museum staff), Secretary.

The Working Party has concluded that the use of computers would enable the staff of the Museum to provide an improved service to the public and it expects automation to pervade all sections of the Museum during the next few years. It makes recommendations about the introduction of computers in terms of the work to which they should be applied initially, the staff required to set up the systems and continue the work, the sort of equipment to buy and the continuing need for a committee to guide the introduction of automation.

S.Michaelson
Convenor.

1. SUMMARY OF CONCLUSIONS.

The Museum's collections are large and a complete catalogue would be very large. It is only recently that computers and devices for the storage of data in bulk have become cheap enough for non-commercial institutions, such as the Museum, to store and use such large amounts of data on-line. This Working Party was set up to consider the worth of computers and automation in the Museum.

We perceive that many benefits will accrue to the NMAS, to Scottish Museums in general, to the Universities, to other Institutions and to the general public from the introduction of automated information processing. We conclude that the NMAS should apply to the SED for a budget in 1985-6 and subsequent years to cover the purchase of microcomputer equipment and the appointment of staff to begin computerisation of the storage and retrieval of information relating to its existing holdings.

We therefore recommend that:-

Computers be installed as tools for the museum, to be used initially for the following tasks:-

Production of an index to the existing catalogue.

Generation of supplementary indices from the main index.

Production of 'hand-lists' of all new acquisitions.

Facilitation of administrative and office work.

Development of a system for registration and acquisition.

Funding be sought to employ staff for 3 years in the first place. The funding should be reconsidered as part of an overall review of progress after 2 years.
Equipment be purchased in three phases spread over three years.
A Project Supervisory Committee be set up to guide the initial stages of automation. This committee should include potential users of the new facilities that will be offered by the Museum.

We estimate that the NMAS will need to apply to the SED for:-

Capital costs:

First year:	£41,000
Second year:	£31,000
Third year:	£27,000

Recurrent costs: (Jan 1984 pay scales+3%)

First year:	£37,158
Second year:	£44,742
Third year:	£48,579

Recurrent costs are based upon pay scales in force in January 1984, increased by 3%. They include National Insurance and VAT.
Office accommodation, furniture, stationery etc. will be provided by NMAS.

2. INTRODUCTION.

The Museum has at the moment a total staff complement of 59, spread through 12 different sections, these being:-

> The Administration, the Artefact Research Unit, Conservation, Country Life, Design, Education, the Library, Mediaeval, Modern, Photography, Prehistoric to Viking, Research.

While each of the curatorial sections is mainly involved with objects from its own period, the other sections deal (in principle) with the complete range of artefacts within the museum's huge collection. The museum catalogue was printed in 1892 and this edition, together with the typewritten appendices, remains the standard reference for the collection. It is difficult to know quite how many objects there are in the collection, but estimates are of half a million objects in the prehistoric section alone. The collection is growing at the rate of around 3,000 items per year. Examples from the catalogue are given in Appendix A.

The various sections of the museum do not all lie within one building, but are spread throughout Edinburgh. Each of the curatorial sections and the administration has a base in York Buildings or within the museum itself in Queen Street. The Country Life Section runs the Scottish Agricultural Museum at Ingliston, with storage at Port Edgar and an Engineering workshop at Granton. The Artefact Research Unit is in the West End, while the Research and Conservation Laboratories are at Granton with other conservation laboratories in York Buildings and in the new museum store in Leith.

This proposal is for work that will take well over three years to bring to completion. As one peers further into the future it becomes clear that the needs of the Museum will not be as we see them now, the technology available at a suitable price will alter significantly and the financial climate will remain murky. We can, therefore, do no more than sketch the lines along which we would expect the pilot project to develop and we recommend that a supervisory committee be set up to guide the development of the project.

3. AIMS OF COMPUTERISATION.

The Williams Report [1] constantly stresses the importance of communication. One of the main goals of automation is that information about objects in the collection should be easily and rapidly recoverable. This ready availability of information will facilitate the bringing together of items of information which, having been separately gathered, are in fact related. It is also essential for the fuller interpretation of the collection, both by specialists and by the general public. The aims of implementing computer-based record keeping within the NMAS are:-

> To make information about the NMAS collection more widely available to specialists and to the general public.
>
> To improve overall efficiency in answering enquiries.
>
> To make more effective use of staff.
>
> To build up information associated with artefacts in computer files to form the nucleus of the National Inventory based in the Museum of

Scotland, in a way that is compatible with other institutions.

To allow the rapid production of printed 'hand-lists' and catalogues of specific aspects of the collection and new acquisitions.

To standardise the recording of information relating to all aspects of artefact acquisition.

To improve administration and office management.

Since one of the main aims of using computers is to free staff for more productive work, the initial phase should be to make the existing information more readily retrievable by the curatorial staff. This may be done by the compilation of an index to the existing catalogue, involving extremely brief entries for each object but including a sufficient number of fields to allow useful searches to be made.

The structure of a proposed 'record card' for the recording of object information for this index is given in Appendix B. A simple data set and some of the hand-lists that can be derived from it are displayed in Appendix C.

For new acquisitions it is proposed that more detailed records should be completed including more descriptive and source information. The data from these records will be used to produce acquisition lists and can be automatically added to the index. In addition it will be used to transfer appropriate details onto standard forms for the legal transfer of title. The provision of this data will be a task for the curatorial staff. Structures for these record files are under consideration.

The ability to exchange information with other institutions is of obvious importance. Data standards and both computer hardware and software have to be chosen with this in mind. The latter are discussed in the technical section below where the transfer of (some parts of) the data files into the Edinburgh University Computer Network is proposed. The data standards used are to be compatible with those recommended by the MDA[4]. While this is fairly straightforward for the indexing work it becomes more crucial in records where more descriptive information is included and development of these will follow discussion with the MDA as well as other relevant bodies in Scotland (the RCAHMS, RSM, SDD, universities etc).

Thus, as computers are installed as tools for the museum, the initial tasks undertaken will be:-

Production of an index to the existing catalogue.

Generation of supplementary indices from the main index.

Production of 'hand lists' of all new acquisitions.

Facilitation of administration and office work.

Development of a system for registration and acquisition.

Development of instructive and attractive displays of information for the public.

4. AREAS OF MUSEUM ACTIVITY TO WHICH COMPUTERS ARE APPLICABLE.

The curatorial staff will be involved in the preparation of data for entry to the computer data-base, particularly in connection with items 4.1.3, 4.1.5 and 4.1.6.

4.1 Object Oriented.

4.1.1 Index to the Catalogue.

Extraction of the basic information from the existing catalogue and its transfer into a computer data-base to allow the rapid location of existing material and documentation and its rapid putting into order.

4.1.2 Index of objects.

The numbering and maintenance of an up-to-date cross-reference index of the various numbers associated with each object as it moves through several sections of the museum before arriving in a store or museum gallery.

4.1.3 Registration.

The completion of initial documentation and acquisition information with minimal descriptive detail. This information can be incorporated into the indices above without further handling, by transfer between computers. It does not replace cataloguing proper but it can make enough information immediately available to tide over a period when the material to be catalogued accumulates faster than it can be processed by the curatorial staff.

4.1.4 Object location.

Details of the current distribution of objects within each section, continuously kept up to date.

4.1.5 Cataloguing.

This is distinct from registration in that as much information as possible, or as necessary, is included, with full description, identification, provenance and reference details as well as pointers to all other recorded aspects of the documentation of the object. Because of the detail it can take a long time before accessioned material is finally catalogued, but then the catalogue can be used as the main file for all enquiries relating to the object.

4.1.6 Technical Information.

The recording of basic details of any conservation treatment, materials analysis, dating, photography or other technical examination.

4.1.7 Loan Details.

The maintenance of up-to-date records of objects on short and long term loan to the museum, and those items lent by the museum to outside bodies.

4.1.8 Exhibition Details.

Details and documentation of material selected, borrowed or purchased for special exhibition displays together with loan periods, display conditions, special requirements, insurance and transport details etc. for material lent to or by the museum.

4.1.9 Distribution Mapping.

Preparation of maps of objects, practices and customs.

4.1.10 Publication.

Research and publication in depth of particular aspects of the collection.

4.1.11 Archives.

Indexing of the photographs, manuscript and printed material and the location of artefacts outside the museum, the details of which may be held by other institutions. It is clearly necessary to maintain compatibility with the RCAHMS, the universities, the SDD, the RSM and other museums and bodies which hold records.

4.2. Administration.

The administration section has similarities to any business office with staffing levels akin to those of the museum. The activities to which modern business methods are relevant therefore generally apply. Areas which spring to mind are:

4.2.1 Financial control and accounting for the purchase of objects.

Control of expenditure on objects and material purchased from the budgets of the individual sections. This should be linked to the files of records about objects so that the receipt, registration, payment and ownership of fresh acquisitions can be monitored.

4.2.2 Museum shop.

Stock control and accounting of the museum shop (in conjunction with the education section).

4.2.3 Financial control of general expenditure.

Control of general administrative expenditure in the day-to-day running of the museum.

4.2.4 Personnel records.

Personal files of staff, name and address details, their positions on various museum subcommittees for circulation purposes etc. Also sick leave, annual leave and other personal details needed by SOCS. Care will be essential to ensure compliance with the laws relating to the protection of data, as they develop.

4.2.5 Document preparation.

Word processing for circulated letters, financial reports, annual reports, acquisition lists etc.

4.3 The Library

The advantages of computerised retrieval systems are well known in libraries and a considerable amount of work has been done in producing commercially available library 'packages', many aspects of which could be relevant to the NMAS library. A full study of the needs of the NMAS library has not yet been made. This should be carried out in collaboration with staff from the Edinburgh University Library who have been involved in the recent computerisation project. The main advantages which would be expected are in connection with:

4.3.1 Cataloguing.

Maintaining indexes and up-to-date records of books and periodicals in the collection.

4.3.2 Location details.

4.3.3 Circulation.

Loan information with recall dates and circulation details.

4.3.4 Subject indexing.

Keyword indices and their availability for use in a directly interrogable system (by library staff or by users).

4.3.5 Acquisitions.

Information and records about purchase, donation and ordering.

4.4 Technical Sections

Recording and cross-referencing of work done on objects are general requirements of the photographic, conservation and research laboratories. In each case the bare details of this work should be apparent on examination of the main catalogue entry for each object, while further details should be retrievable from the appropriate specialist file.

In the Research Laboratory one of the main uses of computers is for the handling of numerical data, i.e. reducing raw numerical data from analytical equipment into useful forms, calculations which otherwise could not reasonably be carried out. These data are stored in computer files and subsequently recalled for graphical and statistical interpretation using further programmes. The analytical apparatus effectively embodies micro-computers but there is a need for greater computing power, particularly for statistical interpretation. Results from these analyses, when collected in data-bases, may be combined with descriptive details of artefacts to produce specialist reports and fuller catalogue entries.

At the Artefact Research Unit the main requirement is for the storage and retrieval of details of excavated material, combining the need for 'data-base retrieval', statistical programming and graphical presentation. The ability to select and sort data is essential in this context.

Where the information is generated and used jointly by the staffs of the Museum and the Universities, it is normal to share the graphical and other information that either party generates. This would be much facilitated by the connection of the Museum to the Joint Academic Network (JANET) which already interconnects the Universities. Such a connection would also improve the ability of the staff of the Museum to make use of services, such as mapping and high-quality document production, developed by many departments of universities.

4.5 Education

Communication with the public is intimately linked to design and display where, as mentioned below, there are exciting possibilities for interaction with the public. Although this sort of use is not proposed for the initial stages of museum automation, when information has been stored in a form which can readily be retrieved and processed by computer, the use of attractive techniques for educational display will be made much easier than it is at present. We look forward to the vivid presentation of the course of development of many aspects of Scotland's history, the growth and decline of the cattle trade, the ebb and flow of settlement from prehistoric times to new towns; it may even be possible to present the tortuous events of the Union in a form comprehensible to the layman!

There is scope in this section for information storage and retrieval, mainly relating to visiting parties, containing their number, make-up, contact address, special interests, worksheets used, feedback from previous visits etc. These requirements are likely to be met to a large extent by the same kind of business management techniques as would benefit the administration section.

Information regarding the location and availability of loan and exhibition material should be readily available to the education section, as should details of the main collection itself.

Information about local museums in Scotland for subjects of special interest may also be available to visitors if the Museum of Scotland becomes a 'heritage centre'.

The NMAS already has a training function for curatorial and conservation staffs, a role which the Williams report wished to see developed further [1, para 9.112]. There is considerable scope for computerised storage, manipulation and distribution of bibliographies, contact lists for particular subject fields, notes on work in progress and details of courses, conferences and seminars.

4.6 Design

In the planning of exhibitions many of the technical data relating to the objects are needed by the design staff. Such data will include dimensions, weight, material, as well as special display conditions such as permissible relative humidity and light levels and the degree of protection necessary. The availability of much of this information in technical files linked to the main catalogue entry would assist in the rapid assessment of material suitable for a particular display. In due course the graphical techniques that have been developed for use by architects and planners will become readily available for use in the design of exhibitions.

As the Williams report noted, "New technology offers opportunities (as well as challenges) to museums in presenting their displays to the public" [1, para 3.7]. Such technology includes video-cassettes and holograms as well as information retrieval systems linked to television or computer graphics, these being used in automatic response to visitor enquiries. The use of display and communication methods such as these raise exciting possibilities, although as the Williams report also notes in the same section: "The National Museums and Galleries will therefore be wise to resist the introduction of technological innovations into displays inside the museum which diminish unduly the amount of time visitors spend face to face with real objects." Nevertheless such techniques will be of value in presenting structured accounts of the development of sites and artefacts, which will raise the level of understanding with which visitors perambulate.

5. ADVANTAGES ARISING FROM COMPUTER BASED MANAGEMENT.

The actual advantages of using computer based systems in any of the areas broadly discussed above depend on the efficiency and extent of development of the existing 'conventional' methods. There may be little point in replacing a satisfactory card index system simply 'to computerise', especially if it is done in isolation. Except in certain areas however, existing systems in the NMAS are open to improvement: even in those which are not so, the advantages of ready communication between areas is well worth gaining. There are several benefits which arise from computerisation, each of which is likely to free staff for more productive work.

5.1 More efficient use of staff time.

For the curatorial staff who deal with enquiries from the public this will be a consequence of the rapid access to information, its automatic duplication, sorting and searching described below. For those engaged in exhibitions it will result from their use of computers for the administrative work associated with exhibitions and also from the use of techniques of computer-aided design.

5.2 Rapid availability of information to answer enquiries.

Access to selected parts of information about artefact location, registration numbers etc. should be available to all users once it has been put into a computerised record keeping system. This means that non-confidential data can be available to different sections without having to prepare and maintain card indexes or other filing media at each location.

5.3 Improved Communication.

The development of communications so that information on the collection is directly available to outside users is one of the major long-term aims of a 'National Inventory' catalogue. Providing selected information to the universities through the Edinburgh University Network and its connection to the Joint Academic Network should be a fairly straightfoward task, while further expansion is expected to follow the MDA work.

5.4 Automatic indexing.

This will produce 'hand-lists' of all or selected parts of a file of data. This is one of the major advantages, principally in that lists using different indexes (for example alphabetical index of object, alphabetical index of donors, or a list of objects arranged by acquisition data) can be generated from information fed into the system just once, provided it is correctly structured. (See Appendix C for specimens.)

5.5 Ease of updating records.

Computer-based systems provide the ability to update and modify records by typing only the new information, not the complete record card, text page etc.

5.6 Maintenance of consistency.

Automatic replacements of updates or changes through a series of record cards or pages of text without having to search for each occurrence individually.

5.7 Keeping track of objects.

Precise knowledge of object movement because of the ease of updating the appropriate files.

5.8 Development of the National Inventory.

This was recommended by the Williams Report [1] to be one of the responsibilities of the Museum of Scotland.

5.9 Answering queries.

Direct interrogation of a data base is possible in response to a specific enquiry. The results of the enquiry can be produced directly as lists - as brief or detailed as the data allows and the questioner requires. Enquiries based on several criteria are possible. The depth

to which such enquiries can be made and the time taken depends on the structure of the database and the particular computer system (see below).

5.10 Archival Storage.

While details of this again depend on the configuration of the system used, the ease with which duplicate copies of stored information can be made means that archival files can be regularly made and updated.

5.11 Work analysis.

Ability to monitor and analyse enquiries and the time spent answering them to help in the development of improved proceedures.

6. THE MUSEUM DOCUMENTATION ASSOCIATION.

6.1 General.

The benefits of computer based data storage and retrieval systems are now well accepted in many fields of business and are becoming so in museums. Much of the pioneering work has been performed by the Museum Documentation Asociation (MDA), an independent body which was established in 1977 to assist museums to register and catalogue their collections [2]. The stated aims of the MDA are: to promote the development of museums as sources of information; to research and develop methods of documenting collections; to provide training facilities in such methods; to advise and assist museums and to liase with other relevant bodies. Until recently the main emphasis of the MDA has been on the production of documentation about cataloguing procedures together with the design of record cards to be used for cataloguing many different types of collection. In 1982 over 300 museums were using these cards, some 300,000 of which are sold each year. The record cards are designed so that the information can be manipulated by a computer programme, GOS, to prepare indexes, catalogues etc.

6.2 The MDA GOS programme.

Because the MDA programme package GOS was written specially for creating, updating and manipulating museum catalogues by computer it has many sophisticated features specific to this task. It is thus in a somewhat different category from the use of commercial 'data-base management' programmes. Of particular note are the ability to create and modify records of arbitrary length and to include as many or as few fields in each record as is appropriate to the object being recorded. The strength of these facilities in full cataloguing is evident if one considers that catalogue information is not static, but grows as more work is carried out on the material. For example, when a new identification is made this should be recorded together with previous identifications, instead of simply replacing them, unless there is some overwhelming reason for only accepting the latest opinion. Similarly, new conservation treatment should be added to the record of previous treatments rather than replacing the previous entry.

GOS is now being used at the National Maritime Museum for cataloguing work on the collection, and is run within the museum on a Cromemco microcomputer. Several other machines are available within the museum for data entry and editing by the curatorial staff while the information retrieval section deals with the actual running of the programme. This is a very satisfactory arrangement provided that sufficient technical support staff are available. It should become more straightfoward as MDA is working on a version of GOS to run on smaller machines. The Royal Scottish Museum also use GOS but in an indirect mode – data entry is via a word processing system, electronic transfer to Cambridge then being possible through the ERCC network.

While the NMAS has been a member of the MDA for some years, little use has been made of the MDA services. One reason for this is that the process of transferring unstructured information from the existing records into the highly structured form of the MDA cards is a difficult activity, and one which can really only be performed by the curatorial staff of each section. A second reason is that the computer retrieval capabilities are not at the moment easily available – that is index lists can be produced via Cambridge but the computer cannot be directly interrogated. This, added to the laborious business of transcribing information, typing it onto record cards, proof reading the entries and then sending the cards to the MDA followed by further proof reading and correction of the computer produced lists, has made the system somewhat unsatisfactory, particularly for the large and diverse collections of the NMAS.

One or two museums have begun to use micro-computers to extract information from indices that have been sent back from the GOS service. It may well be worth trying this for at least the smaller collections of the NMAS although the larger collections, such as Prehistoric, may lead to difficulties.

6.3 Alternatives to the immediate use of GOS.

One way to overcome these problems is for the NMAS to operate its own computer based data retrieval system by which information can be entered, edited, reorganised and printed, where the data are actually stored in a way which is (a) compatible with the MDA data standards and (b) can be transferred into the MDA GOS programme by computer link, with no extra retyping, proof reading etc. necessary. Of course until such a system has been in operation for some time (see phasing below) it is hard to predict what benefits might result from full MDA compatibility and a specially tailored system might prove more useful. However, in designing data input formats for the needs of each museum section close consultation with the MDA service departments should be maintained.

The use of computer systems, particularly micro-computers, for data entry to GOS and for basic record keeping in the form of registration details is a field which until recently has received little attention from the MDA. There is now a feeling that this is a basic need in many museums, very often with greater short term benefit to the institution than is to be gained from attempts to start with full cataloguing. The MDA has very recently produced a publication on micro-computers in museums[3].

We conclude that the museum should commence basic registration and record keeping using micro-computers with an internal data-base management system, but that the data should be structured using the MDA conventions so that it will remain compatible for transfer to GOS in the future.

7. TECHNICAL CONSIDERATIONS.

7.1 Hardware.

Possibly the most important technical consideration is that any system chosen now should be capable of improvement in the future as changing needs dictate. Such modifications may arise from the developing requirements of the cataloguing scheme, of the user or of new programmes as they become available. It is certain that more and more storage will be required as the number of individual object records grows and as more facts are known about each object. With an average of 1000 characters used in each record (i.e. to catalogue each object) the estimated half million objects in the prehistoric section would occupy 500 million characters of storage, i.e. 500 Mbytes. While this gives some idea of the storage capacity necessary it would obviously take a considerable time to enter all the data (perhaps as much as 120 man-years) so that it is reasonable to consider far smaller mass storage facilities initially.

Data storage is a major problem with microcomputers, but the situation is changing rapidly as more and more powerful data storage media become available at affordable prices. Video disc storage of catalogue data, including visual images, is an exciting posibility which would be expected to receive serious consideration in any developing project over the next three years.

Linking the micros to a central computer, presumed to be at the university, is something with which the university computing departments have considerable experience. The Cromemco micro at the NMAS research laboratory has already been used to exchange text and numerical data files with the Edinburgh EMAS system. To some extent individual workstations can be linked together by each communicating with, for example, EMAS, but this is likely to be more expensive and slower than the use of an internal network. Network linkage between individual micros is not available for all makes of machine at the moment, but it is becoming more common and should be available for most systems in the near future. It will provide a means of communication between different workstations for the exchange of data files, for 'electronic mail' and for the controlled generation of unique numbers for registration.

7.1.1 Alternative configurations.

There are several configurations which can be considered:

7.1.1.1

A 'mainframe' computer within the museum capable of supporting several terminals throughout the museum and its outstations (i.e. at least 12 terminals would be needed).

7.1.1.2

Individual terminals in the museum linked to a mainframe computer outside the museum and not under direct museum control.

7.1.1.3

Individual microcomputers throughout the museum handling small and medium amounts of information but linked to a mainframe computer external to the museum for archival storage and with which searches of larger masses of data could be made.

In terms of current museum needs and finances option 3 would appear to have most advantages, principally that it can be built up in stages without the requirement of the high initial outlay of 1. Also individual microcomputers would each be under the operator's control, a consideration which might make mixed usage more flexible. Option 2 is likely to be expensive in computer hire-time and possibly time consuming and frustrating in use if reliance is on telephone lines for communication. Probably the most realistic development is initially as 3, but developing after a few years to a combination of 3 and 1 as large masses of data are built up and demand on the system grows.

A system of type 3 might be built up using individual micros with storage capacities in the range 20 to 80 Mb on hard disc plus floppy or tape or networked back-up. These facilities are available on the IBM personal computer, Sirius, Cromemco and several other machines. The facilities and computing power offered by each manufacturer are constantly improving for more or less the same purchase price, and it is inappropriate to specify precise configurations at this stage. A more detailed study will have to be undertaken in the light of the current technology when funds have been committed to the project. In consequence, the capital costs shown in 9.1 are budgetary estimates, not precise costs.

7.1.2 The basic criteria which will be used in selection of the hardware are:-

7.1.2.1

Individual mass storage should be available in the range 20 to 80 Mbytes per machine. This storage should use a fast medium, i.e. it should be possible to use files of a few megabytes rapidly without resorting to several floppy discs.

7.1.2.2

The available active memory must be sufficient to run the MDA GOS programme when it is available, that is expansion to 256 or 512K must be possible, on at least one 'master' machine.

7.1.2.3

A network system must be available both for file transfer and for communication between different workstations.

7.1.2.4

A recognised operating system such as CP/M or UNIX must be available so that commercially available software can be run.

7.1.2.5

The operating system must be such as to allow communication with the universities, and other specialist users and providers of data.

7.1.2.6

Expansion of memory, processing power and mass-storage peripherals must be possible and anticipated.

7.1.2.7

High resolution graphics capabilities must be available on some of the machines initially and all finally.

7.1.2.8

Service back-up and repair must be reliable, preferably with facilities in or close to Edinburgh.

7.1.2.9

Keyboard and terminal design must be good and adaptable to different users.

7.1.2.10

The price per unit should be less than £5,000 excluding printer (see below)

7.2 Software.

It is envisaged that the initial work could be carried out using a commercial data-base programme, dBASE II or an equivalent. This programme is already in use on the computer in the Research Laboratory and has been found to be quite successful in trial runs with museum data. Experience at the laboratory has shown that it is easy for a novice to use the programme once it has been set up, while at a higher level it has proved flexible in swapping information between differently structured record systems.

The main problem of such a programme running on a micro is that of limited record size: in dBASE II the limitations are for each field to contain less than 255 characters, for there to be less than 33

fields and a total of no more than 1000 characters per record. (The same field size limitations apply to some programmes running on large computers, such as ENUFF on the EMAS system). The programme can handle up to 65535 records per data-base file. Obviously a system of this sort would soon run out of space if full cataloguing information was entered for each artefact, and in many cases there would simply not be sufficient space available for full descriptions. However, one of the most important needs is for the registration of objects, where descriptions can be less extensive, while all reference numbers, classification numbers, acquisition details etc can be included. Information stored using this programme could be read into other, larger, data-handling routines (GOS for example) where it could be added to where appropriate.

The MDA is currently working on the implementation of GOS on micros, the chosen machine being the Cromemco 68000. Since the laboratory micro is also a Cromemco (the Z80 system 3) this machine is an obvious one to consider from the point of view of the MDA and the Museum's own experience. It would make sense to have this type of machine at the laboratories simply for running GOS (which is likely to remain a fairly specialist task), the data being fed in via the other micros in the museum, using dBASEII or a similar package.

7.3 Commissioning.

Experience shows that it usually takes a few months for new equipment to be worked up to a state fit for service. In this project it would be wise to expect a good part of the first year to be taken up with tailoring facilities to fit the particular needs of those sections of the Museum that are first involved

7.4 Technical Support.

There will be a need for additional technical support for the specialist staff that will be recruited for this project and also for the curatorial, the administrative and the research staff who are involved. This need will not vanish at the end of the pilot project. It will be of importance that the Research sections are linked closely to activities in the main Museum. It will also be beneficial to maintain close links with the wide-ranging body of expertise available in the nearby universities.

8. STAFFING.

The introduction of computer use throughout all sections of the NMAS is a major project. It will engage the attention of the curatorial staff in the sections in turn, as their data are adapted to storage and retrieval by computer. It will demand the full-time attention of specialist staff during the change-over to avoid excessive demands on the time of the curatorial departments. Staff will be required for data preparation and data entry in conjunction with the present curatorial staff.

Because of the staffing problems within the museum it is felt that five new posts should be created for the proposed work.
These are:-

Two Research Assistants to prepare and select information from the

present catalogue or other sources in the museum.

Two (initially part-time) typists for data-entry:

One full time Information Officer (Senior Scientific Officer) to assume responsibility for developing and implementing the technical aspects of the whole system.

Initially all these staff will need training, not least in aspects of museum practices. It is assumed that as the project develops the Senior Scientific Officer will acquire the necessary skills to implement and run the MDA GOS programme on the computer purchased for this purpose. He will also be expected to be involved, as time permits, in any education and design work concerning communication with the public by computer graphics and other techniques.

In summary the posts are:
2 Research Assistants (Grade E)
1 Senior Scientific Officer.
2 Typists (initially part time).

9. COSTS.

The costs below are for equipment and staff (as described in section 10). The salary figures are for January 1984 and will have to be increased when the estimates for pay scales for 1985 onwards can be made. Accomodation and other basic requirements will be provided by NMAS.

9.1 Capital Costs.

Totals have been rounded to thousands of pounds sterling to avoid giving a spurious impression of precision.

First year:
4 computer workstations (Prehistoric to Viking, Mediaeval, Modern and Country Life) having individual storage capacities of at least 20 Mbytes (20 million characters), operating under CP/M or equivalent and having capability for expansion and linkage into a network system.
Cost for each unit £5,000. £20,000

4 modest printers: unit cost £1,000 £4,000

1 computer workstation for use in administration and for word-processing. Smaller storage capacity is initially needed but the machine must be expandible and compatible with the other 4.
Cost for each unit £5,000 £5,000

A letter quality printer to be associated with the above.
£1,500

Total (estimated) hardware including VAT. £35,000

Suitable computer software for the tailoring of appropriate programmes for indexing and data-base work. Also software for statistics and other data preparation and presentation work.
£4,000

Suitable business management and word-processing software. £1,000

Total (estimated) software including VAT £6,000

Total £41,000

Second year:

3 extra workstations (Education, the Library and the Conservation Laboratory) plus a larger machine for the Research Laboratory. This last machine will also be used for development and to support and run bigger programmes, especially the MDA GOS package.
Total (estimated) hardware including VAT. £27,000

Further commercial software for existing systems.
Total (estimated) software including VAT. £4,000

Total £31,000

Third year:

Hardware costs for networking the independent workstations and providing central mass-storage accessible to all users.
Total (estimated) harware including VAT. £23,000

Software associated with the above.
Total (estimated) software including VAT. £4,000

Total £27,000

9.2 Recurrent Costs.

Staff details are given in the following section. The salaries are calculated from the January 1984 pay scales, increased by 3%.

First Year:
Salaries £28,983 + £2,425 NI
Running £5,000 + £750 VAT. Total £37,158

Second Year:
Salaries £33,863 + £2,829 NI
Running £ 7,000 + £1,050 VAT. Total £44,742

Third Year:
Salaries £35,274 + £2,955 NI
Running £ 9,000 + £1,350 VAT. Total £48,579

10. PHASING.

It is a commonplace experience that most projects for automation do not proceed smoothly. It usually turns out that suppliers deliver late, equipment and programs do not behave exactly as was expected, the labour of dealing with existing material is greater than was predicted and there is a shortage of experienced staff. Therefore what follows is but a sketch of the phasing of the initial stages of the proposed project.

10.1 Year 1.

Appointment of the three specialist staff.

Appointment of two part-time typists.

Training of new staff.

Purchase of four 'curatorial' workstations (for Prehistoric to Viking, Mediaeval, Modern and Country Life) with the capabilities described above, plus printers and dBASE II software.

'Working-up' of new equipment.

Purchase of one workstation similar to the above but for administrative use, with letter quality printer, business and word-processing software.

Consultation with MDA and other bodies, particularly within Scotland, to agree on data formats.

Configuration of data-base systems for indexing.

Development of data-entry and interrogation procedures.

Appoint part-time typists.

Initiation of the extraction of index details from the existing catalogue and data-entry to the computer.

Preparation for on-line registration of acquisitions.

Preparation for production of full hand-lists of all acquisitions.

10.2 Year 2.

Data entry for all acquisitions.

Continuation of extraction and data-entry for index.

Production of full hand-lists of acquisitions.

Linkage of existing micros together and to the university computer.

Purchase of further workstations (Education, the Library and the Conservation Laboratory) with increased storage capacity as available and appropriate.

Study of the needs of the Library.

Development of interrogation proceedures for large amounts of data via central computer.

Purchase of micro for implementation of GOS at the laboratories.

Production of hand lists of selected parts of the collection.

Details of the major museum exhibition to be handled in one of the registration computers.

Data transfer to the MDA computer to be organised.

Overall review of progress and planning for further development.

Completion of an index to the catalogue for two sections of the Museum.

10.3 Year 3.

Data entry as above.

Expansion to all museum outstations with development of full linkage of machines.

Use of on-line programs handling larger data-sets.

Routine use of GOS for full catalogue entries.

Upgrading of earlier micros.

Initial implementation of system for Library.

Investigation of installation of small mainframe within museum.

Information service in the galleries for use by visitors.

Preparation of the index to the catalogue for two further sections of the Museum.

11. REFERENCES.

1. "A Heritage for Scotland", Report of a Committee appointed by the Secretary of State for Scotland under the Chairmanship of Dr Alwyn Williams. HMSO 1981.

2. "Introduction to the Museum Documentation Association", 1980 and "Practical Museum Documentation", 1981, both available from the MDA, Imperial War Museum, Duxford Airfield, Cambridgeshire CB2 4QR.

3. "Microcomputers in Museums." Edited by R Light 1984, available from the MDA as 2 above.

4. "Data Definition Language and Data Standard." MDA June 1980.

APPENDIX A

Cinerary Urns of Clay -

201. Cinerary urn, restored, base wanting, buff coloured with reddish tint, 10¾" across mouth, found inverted over incinerated remains, near the top of a large burial mound at Blair Drummond, Perthshire. - Presented by Sir A. Kay Muir, Bart., 1929. (1929 - 7).

202-203c. Two Cinerary Urns: (202) 15¼" high, 13" dia. at mouth, dark brown ware, loops and chevrons on rim; (203)* light brown ware, 10¾" high, 13" dia. at mouth, bottom amissing, found on site of a cairn at Lintlaw, Bunkle, Berwickshire.

(203a,b,c.) Two flint chips, one calcined, and piece of iron like the end of a nail, found in a cist under the cairn.

Presented by The Rt. Hon. The Earl of Home, K.T., F.S.A.Scot., 1931. (1931 - 890 to 891c).

* 2 impressions of Naked Barley - Jessen & Helbaek (1944) p21.

204. Cinerary Urn, 12¼" high, as restored, 9⅜" dia. at mouth, cordon below rim, built up from fragments in the Museum. Found on Glenluce Sands, date unknown. (1931 - 920)

205. Part of cinerary urn, rim overhanging, upper part with vertical zig-zags, cord impressions below, found well up Manor Water, Peeblesshire. - Anonymous, 1932. (1932 - 48)

206. Upper part of a cinerary urn, dark brown ware, found on Lundin Links, Fife. - Presented by George A. Gibb, Drogan, Lundin Links, 1932. (1932 - 262)

207-8. Urn, reddish ware (restored) with heavy overhanging rim, vertical neck and slight moulding where the neck joins the lower part, lozenge designs, and Base and wall fragments (208) of a cinerary urn of coarse reddish ware, bound at Monklaw, near Jedburgh. - Presented by The Most Hon. The Marquess of Lothian, 1934. (1934 - 58,59).

TITLE OVAL VEGETABLE DISH

MEK 75 (1-3)

Description: Pale blue and white glazed earthenware, from a dinner service. Transfer printed with double poppy and bindweed design on inner surface, with leaf-scroll design round rim and oval foot.

Mark: Underside transfer printed - a bell within a belt inscribed "J & M.P.B. LD. TRADEMARK" and "GLASGOW" on a scroll beneath.

Dimension: Diam 30.3 cm x 21 cm; height 7.1 cm.

Presented by: J.S. Richardson, LL.D. and used in the donor's family.

MEK 75 (1-4)
1950 604

TITLE OVAL VEGETABLE DISH

Description: Pale blue and white glazed earthenware from a dinner service. Transfer printed with double poppy and bindweed design on inner surface, with leaf-scroll design round rim and on oval foot.

Mark: Underside transfer printed - a bell within a belt inscribed "J & M.P.B. LD. TRADEMARK" and "GLASGOW" on a scroll beneath.

Dimension: 30.3 cm x 21 cm; height 7.1 cm.

Presented by: J.S. Richardson, LL.D. and used in the donor's family.

APPENDIX B. Format for Index files.

Aim. Compilation of sufficient information from existing catalogue (or other) entries to form an index which will:-

(i) Allow the printing of index lists.
(ii) Allow computer searches with more than one parameter.
(iii) Be compatible with the MDA system.
(iv) Form the skeleton to which fuller description, documentation, association, acquisition and other detail may be added at a future date.
(v) Be brief so as not to use excessive computer storage.

The following are considered to be the most important features, each of which is allocated a maximum number of characters. A system of abreviations and conventions will be drawn up.

IDENTIFICATION.	Identity number:	9	
	Catalogue number:	11	
	Simple name:	20	
	Full name:	40	
	Title:	40	
			Total 120
COLLECTION.	Site name:	20	
	Parish	20	
	County	20	
	Other	20	
	National Grid Ref.	10	
	Collection method:	10	
	Collector or excavator:	20	
	Date:	10	
			Total 130
ACQUISITION.	Acquisition method:	10	
	Acquired from:	60	
	Date:	10	
	Price:	10	
			Total 90
DESCRIPTION.	Material:	60	
	Condition:	20	
	Completeness:	20	
			Total 100
DATING.	Object period or date:	20	
			Total 20
PRODUCTION.	Method:	20	
	Person's role:	20	
	Name:	40	
	Date:	10	
			Total 90
STORE.	Store:	20	
	Date:	10	
			Total 30
RECORDER.	Name:	20	
	Date:	10	
			Total 30

Total number of characters used: 610

Example of Index Card entry.

IDENTIFICATION

Identity number	:
Catalogue number	: FC8
Simple name	: brooch
Full name	: brooch (silver gilt & penannular)
Title	: Hunterston brooch

COLLECTION

Site name	: Hunterston Estate
Parish	: West Kilbride
County	: Ayrshire
Other	:
National Grid Ref.	:
Collection method	: stray find
Collector or excavator	:
Date	: 1830

ACQUISITION

Acquisition method	: purchase
Acquired from	: Hunter, R
Date	: 1891
Price	:

DESCRIPTION

Material	: silver gilt & gold & amber
Condition	: good
Completeness	: pin broken

DATING

Object period or date	: 700=800

PRODUCTION

Method	:
Person's role	:
Name	:
Date	:

STORE

Store	: S2 case 7
Date	: 1832

RECORDER

Name	: Tate, J
Date	: 14.03.1984

Example of Index Card entry.

IDENTIFICATION

Identity number	: 1929.7
Catalogue number	: EA201
Simple name	: urn
Full name	: cinerary urn
Title	:

COLLECTION

Site name	:Blair Drummond
Parish	:
County	: Perthshire
Other	:
National Grid Ref.	:
Collection method	:
Collector or excavator	:
Date	:1929

ACQUISITION

Acquisition method	:gift
Acquired from	:Kay Muir, Sir A
Date	:1929
Price	:

DESCRIPTION

Material	: clay
Condition	: restored
Completeness	: base missing

DATING

Object period or date	:

PRODUCTION

Method	:
Person's role	:
Name	:
Date	:

STORE

Store	:G2 cupboard 3
Date	:1950

RECORDER

Name	:Tate, J
Date	:14.03.1984

Example of Index Card entry.

IDENTIFICATION

Identity number	: 1950.604
Catalogue number	: MEK 75.4
Simple name	: dish
Full name	: vegetable dish (oval)
Title	:

COLLECTION

Site name	:
Parish	:
County	:
Other	:
National Grid Ref.	:
Collection method	:
Collector or excavator	:
Date	:

ACQUISITION

Acquisition method	: gift
Acquired from	: Richardson, J.S.
Date	: 1950
Price	:

DESCRIPTION

Material	: earthenware (glazed) & transfer print
Condition	: good
Completeness	: complete

DATING

Object period or date	: 1700=1800

PRODUCTION

Method	:
Person's role	: maker
Name	: Bell, J and M.P.
Date	:

STORE

Store	: CH room 4 shelf 10
Date	: 01.02.1984

RECORDER

Name	: Tate, J
Date	: 14.03.1984

STONES IN THE NMAS PREHISTORIC TO VIKING SECTION. (ACCESSION LIST)

ACCESSION	MATERIAL	SITE NAME	COUNTY	STORAGE LOCATION
IB 1	STONE	PRINCES ST GARDENS,EDINBURGH	MIDLOTHIAN	GF-DAS 008
IB 2	STONE	ST PETERS CHURCH, S RONALDSAY	ORKNEY	GF-DAS 009
IB 3	CAST	ISLAY	ARGYLL	?
IB 4	CAST	ISLAY	ARGYLL	CELLAR R1
IB 5	CAST	ISLAY	ARGYLL	CELLAR D3
IB 6	CAST	KILDALTON,ISLAY	ARGYLL	GF-DAS 043
IB 7	CAST	MEIGLE	PERTHSHIRE	?
IB 8	CAST	MEIGLE	PERTHSHIRE	?
IB 9	STONE	HODDAM	DUMFRIESSHIRE	GF-DAS 023
IB 10	STONE	KNOCK-AN-FRUICH,GRANTOWN	INVERNESSHIRE	GF-DAS 017
IB 11	STONE	FINDLARIG,STRATHSPEY	INVERNESSHIRE	CUSTOM HOUSE, LEITH
IB 12	CAST	GOVAN,GLASGOW	RENFREWSHIRE	CUSTOM HOUSE, LEITH
IB 13	CAST & SARCOPHAGUS (PORTION)	ST ANDREWS	FIFE	GF-DAS 037
IB 14	CAST & SARCOPHAGUS (PORTION)	ST ANDREWS	FIFE	GF-DAS 037
IB 15	CAST & SARCOPHAGUS (PORTION)	ST ANDREWS	FIFE	GF-DAS 037
IB 16	STONE	MULL OF SUNNONESS	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 17	STONE	EILEAN MORE	ARGYLL	CUSTOM HOUSE, LEITH
IB 18	STONE	UYEA	SHETLAND	CELLAR C1
IB 19	STONE	--	SHETLAND	CELLAR C1
IB 20	STONE	LASSWADE	MIDLOTHIAN	CELLAR E2
IB 21	STONE	LASSWADE	MIDLOTHIAN	CELLAR E4
IB 22	STONE	CASTLE HILL,KINTORE	ABERDEENSHIRE	GF-DAS 015
IB 23	STONE	CASTLE HILL,KINTORE	ABERDEENSHIRE	CUSTOM HOUSE, LEITH
IB 24	STONE	FIRTH	ORKNEY	CUSTOM HOUSE, LEITH
IB 25	STONE	MONIEFIETH	ANGUS	CUSTOM HOUSE, LEITH
IB 26	STONE	MONIEFIETH	ANGUS	CUSTOM HOUSE, LEITH
IB 27	STONE	MONIEFIETH	ANGUS	GF-DAS 035
IB 28	STONE	MONIEFIETH	ANGUS	CUSTOM HOUSE, LEITH
IB 29	STONE	LIBERTON TOWER,EDINBURGH	MIDLOTHIAN	CUSTOM HOUSE, LEITH
IB 30	CAST	MILTON,LESMAHAGOW	LANARKSHIRE	CUSTOM HOUSE, LEITH
IB 31	STONE	ST ASAPH'S,BERNERAY	HEBRIDES(OUTER)	CUSTOM HOUSE, LEITH
IB 32	CAST	NEWTON	ABERDEENSHIRE	?
IB 33	STONE	DROMMORE	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 34	STONE	WHITHORN	WIGTOWNSHIRE	GF DISPLAY 5/11/83
IB 35	STONE	WHITHORN	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 36	STONE	FORTEVIOT	PERTHSHIRE	GF-DAS
IB 37	STONE	STROME SHUNNAMAL, BENBECULA	HEBRIDES(OUTER)	GF-DAS 014
IB 38	STONE	CLUNE,DORES	INVERNESSHIRE	GF-DAS 016
IB 39	STONE	KINGOLDRUM	FIFE	GF-DAS 030
IB 40	STONE	KINGOLDRUM	FIFE	CUSTOM HOUSE, LEITH
IB 41	STONE	KINGOLDRUM	ANGUS	CUSTOM HOUSE, LEITH
IB 42	STONE	BALNAHARD,COLONSAY	HEBRIDES(INNER)	CUSTOM HOUSE, LEITH
IB 43	STONE	CRAIGNARGET,GILLESPIE,GLENLUCE	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 44	STONE	GOSMOUNT,COLDINGHAM	BERWICKSHIRE	CUSTOM HOUSE, LEITH
IB 45	STONE	GLENLUCE CHURCHYARD	WIGTOWNSHIRE	GF-DAS 049
IB 46	STONE	PAPIL,BURRA	SHETLAND	GF-DAS 026
IB 47	STONE	STRATHMARTINE	ANGUS	CELLAR D1
IB 48	STONE	FLOTTA	ORKNEY	GF-DAS 047
IB 49	STONE	ST TARAN'S,TARANSAY	HEBRIDES(OUTER)	CUSTOM HOUSE, LEITH
IB 50	STONE	CASSENDEOCH,OLD LUCE	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 51	STONE	LOCALITY UNKNOWN		CELLAR E2
IB 52	STONE	GATTONSIDE,MELROSE	ROXBURGHSHIRE	CELLAR D4
IB 53	CAST	DUNFALLANDY	PERTHSHIRE	GF-DAS 031
IB 54	STONE	ST NINIAN'S CAVE,PHYSGILL	WIGTOWNSHIRE	CUSTOM HOUSE, LEITH
IB 55	STONE	LOCALITY UNKNOWN		?
IB 56	CAST	BURGHEAD	MORAY	CELLAR E1
IB 57	CAST	BURGHEAD	MORAY	CELLAR D3
IB 58	STONE	DULL	PERTHSHIRE	GF-DAS 038
IB 59	CAST	ST VIGEANS	ANGUS	WP FLOOR 2
IB 60	CAST	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 61	CAST	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 62	CAST	ST VIGEANS	ANGUS	CELLAR ??
IB 63	CAST	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 64	CAST	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 65	CAST	ST VIGEANS	ANGUS	CELLAR D5
IB 66	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 67	CAST	ST VIGEANS	ANGUS	CELLAR D5
IB 68	CAST	ST VIGEANS	ANGUS	CELLAR D4
IB 69	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 70	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 71	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 72	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 73	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 74	CAST	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 75	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 76	CAST	ST VIGEANS	ANGUS	CELLAR C2
IB 77	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 78	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 79	CAST	ST VIGEANS	ANGUS	CELLAR D5
IB 80	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 81	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 82	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 83	CAST	ST VIGEANS	ANGUS	CELLAR D2
IB 84	CAST	ST VIGEANS	ANGUS	CELLAR D1
IB 85	CAST	ST VIGEANS	ANGUS	CELLAR D7
IB 86	CAST?	ST VIGEANS	ANGUS	CUSTOM HOUSE, LEITH
IB 87	CAST	RISKBUIE,COLONSAY	HEBRIDES(INNER)	GF-DAS 045
IB 88	CAST	INCHCOLM	FIFE	CUSTOM HOUSE, LEITH
IB 89	CAST	CATSTANE,KIRKLISTON,EDINBURGH	MIDLOTHIAN	GF-DAS 001
IB 90	CAST	KIRKMADRINE,STRANRAER	WIGTOWNSHIRE	GF-DAS 005
IB 91	CAST	KIRKMADRINE,STRANRAER	WIGTOWNSHIRE	CUSTON HOUSE, LEITH
IB 92	CAST	YARROW KIRK	SELKIRKSHIRE	GF-DAS 003
IB 93	STONE	INCHMARNOCK,BUT	ARGYLL	GF-DAS DISPLAY CASE
IB 94	CAST	RIPON	YORKSHIRE?	CELLAR C3
IB 95	STONE	BURGHEAD	MORAY	GF-DAS 018
IB 96	STONE	BURGHEAD	MORAY	CELLAR D4
IB 97	CAST	INVERALLAN,STRATHSPEY	INVERNESSHIRE	CUSTOM HOUSE, LEITH
IB 98	STONE	ABERNETHY	PERTHSHIRE	CELLAR E5
IB 99	STONE	TULLIBOLE	KINROSS	CUSTOM HOUSE, LEITH
IB 100	STONE	OVER KIRKHOPE,ETTRICK	SELKIRKSHIRE	GF-DAS 100
IB 101	STONE	GELLYBURN,MURTHLY	PERTHSHIRE	GF-DAS 040
IB 102	STONE	KILBAR,BARRA	HEBRIDES(OUTER)	?
IB 103	STONE & RUNES	CUNNINGSBURGH	SHETLAND	GF-DAS 055
IB 104	STONE	AITH'S VOE CUNNINGSBURGH	SHETLAND	CELLAR E4

STONES IN THE NMAS PREHISTORIC TO VIKING SECTION (COUNTY LIST)

COUNTY	SITE NAME	MATERIAL	ACCESSION	STORAGE LOCATION
	LOCALITY UNKNOWN	STONE	IB 51	CELLAR E2
	LOCALITY UNKNOWN	STONE	IB 55	?
ABERDEENSHIRE	CASTLE HILL,KINTORE	STONE	IB 22	GF-DAS 015
ABERDEENSHIRE	CASTLE HILL,KINTORE	STONE	IB 23	CUSTOM HOUSE, LEITH
ABERDEENSHIRE	NEWTON	CAST	IB 32	?
ANGUS	KINGOLDRUM	STONE	IB 41	CUSTOM HOUSE, LEITH
ANGUS	MONIEFIETH	STONE	IB 25	CUSTOM HOUSE, LEITH
ANGUS	MONIEFIETH	STONE	IB 26	CUSTOM HOUSE, LEITH
ANGUS	MONIEFIETH	STONE	IB 27	GF-DAS 035
ANGUS	MONIEFIETH	STONE	IB 28	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 59	WF FLOOR 2
ANGUS	ST VIGEANS	CAST	IB 60	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 61	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 62	CELLAR ??
ANGUS	ST VIGEANS	CAST	IB 63	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 64	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 65	CELLAR D5
ANGUS	ST VIGEANS	CAST	IB 66	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 67	CELLAR D5
ANGUS	ST VIGEANS	CAST	IB 68	CELLAR D4
ANGUS	ST VIGEANS	CAST	IB 69	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 70	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 71	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 72	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 73	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 74	CUSTOM HOUSE, LEITH
ANGUS	ST VIGEANS	CAST	IB 75	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 76	CELLAR C2
ANGUS	ST VIGEANS	CAST	IB 77	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 78	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 79	CELLAR D5
ANGUS	ST VIGEANS	CAST	IB 80	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 81	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 82	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 83	CELLAR D2
ANGUS	ST VIGEANS	CAST	IB 84	CELLAR D1
ANGUS	ST VIGEANS	CAST	IB 85	CELLAR D7
ANGUS	ST VIGEANS	CAST?	IB 86	CUSTOM HOUSE, LEITH
ANGUS	STRATHMARTINE	STONE	IB 47	CELLAR D1
ARGYLL	EILEAN MORE	STONE	IB 17	CUSTOM HOUSE, LEITH
ARGYLL	INCHMARNOCK,BUT	STONE	IB 93	GF-DAS DISPLAY CASE
ARGYLL	ISLAY	CAST	IB 3	?
ARGYLL	ISLAY	CAST	IB 4	CELLAR R1
ARGYLL	ISLAY	CAST	IB 5	CELLAR D3
ARGYLL	KILDALTON,ISLAY	CAST	IB 6	GF-DAS 043
BERWICKSHIRE	GOSMOUNT,COLDINGHAM	STONE	IB 44	CUSTOM HOUSE, LEITH
DUMFRIESSHIRE	HODDAM	STONE	IB 9	GF-DAS 023
FIFE	INCHCOLM	CAST	IB 88	CUSTOM HOUSE, LEITH
FIFE	KINGOLDRUM	STONE	IB 39	GF-DAS 030
FIFE	KINGOLDRUM	STONE	IB 40	CUSTOM HOUSE, LEITH
FIFE	ST ANDREWS	CAST & SARCOPHAGUS (PORTION)	IB 13	GF-DAS 037
FIFE	ST ANDREWS	CAST & SARCOPHAGUS (PORTION)	IB 14	GF-DAS 037
FIFE	ST ANDREWS	CAST & SARCOPHAGUS (PORTION)	IB 15	GF-DAS 037
HEBRIDES(INNER)	BALNAHARD,COLONSAY	STONE	IB 42	CUSTOM HOUSE, LEITH
HEBRIDES(INNER)	RISKBUIE,COLONSAY	CAST	IB 87	GF-DAS 045
HEBRIDES(OUTER)	KILBAR,BARRA	STONE	IB 102	?
HEBRIDES(OUTER)	ST ASAPH'S,BERNERAY	STONE	IB 31	CUSTOM HOUSE, LEITH
HEBRIDES(OUTER)	ST TARAN'S,TARANSAY	STONE	IB 49	CUSTOM HOUSE, LEITH
HEBRIDES(OUTER)	STROME SHUNNAMAL, BENBECULA	STONE	IB 37	GF-DAS 014
INVERNESSHIRE	CLUNE,DORES	STONE	IB 38	GF-DAS 016
INVERNESSHIRE	FINDLARIG,STRATHSPEY	STONE	IB 11	CUSTOM HOUSE, LEITH
INVERNESSHIRE	INVERALLAN,STRATHSPEY	CAST	IB 97	CUSTOM HOUSE, LEITH
INVERNESSHIRE	KNOCK-AN-FRUICH,GRANTOWN	STONE	IB 10	GF-DAS 017
KINROSS	TULLIBOLE	STONE	IB 99	CUSTOM HOUSE, LEITH
LANARKSHIRE	MILTON,LESMAHAGOW	CAST	IB 30	CUSTOM HOUSE, LEITH
MIDLOTHIAN	CATSTANE,KIRKLISTON,EDINBURGH	CAST	IB 89	GF-DAS 001
MIDLOTHIAN	LASSWADE	STONE	IB 20	CELLAR E2
MIDLOTHIAN	LASSWADE	STONE	IB 21	CELLAR E4
MIDLOTHIAN	LIBERTON TOWER,EDINBURGH	STONE	IB 29	CUSTOM HOUSE, LEITH
MIDLOTHIAN	PRINCES ST GARDENS,EDINBURGH	STONE	IB 1	GF-DAS 008
MORAY	BURGHEAD	CAST	IB 56	CELLAR E1
MORAY	BURGHEAD	CAST	IB 57	CELLAR D3
MORAY	BURGHEAD	STONE	IB 95	GF-DAS 018
MORAY	BURGHEAD	STONE	IB 96	CELLAR D4
ORKNEY	FIRTH	STONE	IB 24	CUSTOM HOUSE, LEITH
ORKNEY	FLOTTA	STONE	IB 48	GF-DAS 047
ORKNEY	ST PETERS CHURCH, S RONALDSAY	STONE	IB 2	GF-DAS 009
PERTHSHIRE	ABERNETHY	STONE	IB 98	CELLAR E5
PERTHSHIRE	DULL	STONE	IB 58	GF-DAS 038
PERTHSHIRE	DUNFALLANDY	CAST	IB 53	GF-DAS 031
PERTHSHIRE	FORTEVIOT	STONE	IB 36	GF-DAS
PERTHSHIRE	GELLYBURN,MURTHLY	STONE	IB 101	GF-DAS 040
PERTHSHIRE	MEIGLE	CAST	IB 7	?
PERTHSHIRE	MEIGLE	CAST	IB 8	?
RENFREWSHIRE	GOVAN,GLASGOW	CAST	IB 12	CUSTOM HOUSE, LEITH
ROXBURGHSHIRE	GATTONSIDE,MELROSE	STONE	IB 52	CELLAR D4
SELKIRKSHIRE	OVER KIRKHOPE,ETTRICK	STONE	IB 100	GF-DAS 100
SELKIRKSHIRE	YARROW KIRK	CAST	IB 92	GF-DAS 003
SHETLAND	--	STONE	IB 19	CELLAR C1
SHETLAND	AITH'S VOE CUNNINGSBURGH	STONE	IB 104	CELLAR E4
SHETLAND	CUNNINGSBURGH	STONE & RUNES	IB 103	GF-DAS 055
SHETLAND	PAPIL,BURRA	STONE	IB 46	GF-DAS 026
SHETLAND	UYEA	STONE	IB 18	CELLAR C1
WIGTOWNSHIRE	CASSENDEOCH,OLD LUCE	STONE	IB 50	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	CRAIGNARGET,GILLESPIE,GLENLUCE	STONE	IB 43	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	DRUMMORE	STONE	IB 33	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	GLENLUCE CHURCHYARD	STONE	IB 45	GF-DAS 049
WIGTOWNSHIRE	KIRKMADRINE,STRANRAER	CAST	IB 90	GF-DAS 005
WIGTOWNSHIRE	KIRKMADRINE,STRANRAER	CAST	IB 91	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	MULL OF SUNNONESS	STONE	IB 16	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	ST NINIAN'S CAVE,PHYSGILL	STONE	IB 54	CUSTOM HOUSE, LEITH
WIGTOWNSHIRE	WHITHORN	STONE	IB 34	GF DISPLAY 5/11/83
WIGTOWNSHIRE	WHITHORN	STONE	IB 35	CUSTOM HOUSE, LEITH
YORKSHIRE?	RIPON	CAST	IB 94	CELLAR C3

STONES IN THE NMAS PREHISTORIC TO VIKING SECTION (SITE LIST)

SITE NAME	ACCESSION NO. & TYPE		STORAGE LOCATION
--, SHETLAND	IB 19	STONE	CELLAR C1
ABERNETHY, PERTHSHIRE	IB 98	STONE	CELLAR E5
AITH'S VOE CUNNINGSBURGH, SHETLAND	IB 104	STONE	CELLAR E4
BALNAHARD,COLONSAY, HEBRIDES(INNER)	IB 42	STONE	CUSTOM HOUSE, LEITH
BURGHEAD, MORAY	IB 56	CAST	CELLAR E1
BURGHEAD, MORAY	IB 57	CAST	CELLAR D3
BURGHEAD, MORAY	IB 95	STONE	GF-DAS 018
BURGHEAD, MORAY	IB 96	STONE	CELLAR D4
CASSENDEOCH,OLD LUCE, WIGTOWNSHIRE	IB 50	STONE	CUSTOM HOUSE, LEITH
CASTLE HILL,KINTORE, ABERDEENSHIRE	IB 22	STONE	GF-DAS 015
CASTLE HILL,KINTORE, ABERDEENSHIRE	IB 23	STONE	CUSTOM HOUSE, LEITH
CATSTANE,KIRKLISTON,EDINBURGH, MIDLOTHIAN	IB 89	CAST	GF-DAS 001
CLUNE,DORES, INVERNESSHIRE	IB 38	STONE	GF-DAS 016
CRAIGNARGET,GILLESPIE,GLENLUCE, WIGTOWNSHIRE	IB 43	STONE	CUSTOM HOUSE, LEITH
CUNNINGSBURGH, SHETLAND	IB 103	STONE & RUNES	GF-DAS 055
DRUMMORE, WIGTOWNSHIRE	IB 33	STONE	CUSTOM HOUSE, LEITH
DULL, PERTHSHIRE	IB 58	STONE	GF-DAS 038
DUNFALLANDY, PERTHSHIRE	IB 53	CAST	GF-DAS 031
EILEAN MORE, ARGYLL	IB 17	STONE	CUSTOM HOUSE, LEITH
FINDLARIG,STRATHSPEY, INVERNESSHIRE	IB 11	STONE	CUSTOM HOUSE, LEITH
FIRTH, ORKNEY	IB 24	STONE	CUSTOM HOUSE, LEITH
FLOTTA, ORKNEY	IB 48	STONE	GF-DAS 047
FORTEVIOT, PERTHSHIRE	IB 36	STONE	GF-DAS
GATTONSIDE,MELROSE, ROXBURGHSHIRE	IB 52	STONE	CELLAR D4
GELLYBURN,MURTHLY, PERTHSHIRE	IB 101	STONE	GF-DAS 040
GLENLUCE CHURCHYARD, WIGTOWNSHIRE	IB 45	STONE	GF-DAS 049
GOSMOUNT,COLDINGHAM, BERWICKSHIRE	IB 44	STONE	CUSTOM HOUSE, LEITH
GOVAN,GLASGOW, RENFREWSHIRE	IB 12	CAST	CUSTOM HOUSE, LEITH
HODDAM, DUMFRIESSHIRE	IB 9	STONE	GF-DAS 023
INCHCOLM, FIFE	IB 88	CAST	CUSTOM HOUSE, LEITH
INCHMARNOCK,BUT, ARGYLL	IB 93	STONE	GF-DAS DISPLAY CASE
INVERALLAN,STRATHSPEY, INVERNESSHIRE	IB 97	CAST	CUSTOM HOUSE, LEITH
ISLAY, ARGYLL	IB 3	CAST	?
ISLAY, ARGYLL	IB 4	CAST	CELLAR R1
ISLAY, ARGYLL	IB 5	CAST	CELLAR D3
KILBAR,BARRA, HEBRIDES(OUTER)	IB 102	STONE	?
KILDALTON,ISLAY, ARGYLL	IB 6	CAST	GF-DAS 043
KINGOLDRUM, FIFE	IB 39	STONE	GF-DAS 030
KINGOLDRUM, FIFE	IB 40	STONE	CUSTOM HOUSE, LEITH
KINGOLDRUM, ANGUS	IB 41	STONE	CUSTOM HOUSE, LEITH
KIRKMADRINE,STRANRAER, WIGTOWNSHIRE	IB 90	CAST	GF-DAS 005
KIRKMADRINE,STRANRAER, WIGTOWNSHIRE	IB 91	CAST	CUSTOM HOUSE, LEITH
KNOCK-AN-FRUICH,GRANTOWN, INVERNESSHIRE	IB 10	STONE	GF-DAS 017
LASSWADE, MIDLOTHIAN	IB 20	STONE	CELLAR E2
LASSWADE, MIDLOTHIAN	IB 21	STONE	CELLAR E4
LIBERTON TOWER,EDINBURGH, MIDLOTHIAN	IB 29	STONE	CUSTOM HOUSE, LEITH
LOCALITY UNKNOWN,	IB 51	STONE	CELLAR E2
LOCALITY UNKNOWN,	IB 55	STONE	?
MEIGLE, PERTHSHIRE	IB 7	CAST	?
MEIGLE, PERTHSHIRE	IB 8	CAST	?
MILTON,LESMAHAGOW, LANARKSHIRE	IB 30	CAST	CUSTOM HOUSE, LEITH
MONIEFIETH, ANGUS	IB 25	STONE	CUSTOM HOUSE, LEITH
MONIEFIETH, ANGUS	IB 26	STONE	CUSTOM HOUSE, LEITH
MONIEFIETH, ANGUS	IB 27	STONE	GF-DAS 035
MONIEFIETH, ANGUS	IB 28	STONE	CUSTOM HOUSE, LEITH
MULL OF SUNNONESS, WIGTOWNSHIRE	IB 16	STONE	CUSTOM HOUSE, LEITH
NEWTON, ABERDEENSHIRE	IB 32	CAST	?
OVER KIRKHOPE,ETTRICK, SELKIRKSHIRE	IB 100	STONE	GF-DAS 100
PAPIL,BURRA, SHETLAND	IB 46	STONE	GF-DAS 026
PRINCES ST GARDENS,EDINBURGH, MIDLOTHIAN	IB 1	STONE	GF-DAS 008
RIPON, YORKSHIRE?	IB 94	CAST	CELLAR C3
RISKBUIE,COLONSAY, HEBRIDES(INNER)	IB 87	CAST	GF-DAS 045
ST ANDREWS, FIFE	IB 13	CAST & SARCOPHAGUS (PORTION)	GF-DAS 037
ST ANDREWS, FIFE	IB 14	CAST & SARCOPHAGUS (PORTION)	GF-DAS 037
ST ANDREWS, FIFE	IB 15	CAST & SARCOPHAGUS (PORTION)	GF-DAS 037
ST ASAPH'S,BERNERAY, HEBRIDES(OUTER)	IB 31	STONE	CUSTOM HOUSE, LEITH
ST NINIAN'S CAVE,PHYSGILL, WIGTOWNSHIRE	IB 54	STONE	CUSTOM HOUSE, LEITH
ST PETERS CHURCH, S RONALDSAY, ORKNEY	IB 2	STONE	GF-DAS 009
ST TARAN'S,TARANSAY, HEBRIDES(OUTER)	IB 49	STONE	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 59	CAST	WP FLOOR 2
ST VIGEANS, ANGUS	IB 60	CAST	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 61	CAST	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 62	CAST	CELLAR ??
ST VIGEANS, ANGUS	IB 63	CAST	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 64	CAST	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 65	CAST	CELLAR D5
ST VIGEANS, ANGUS	IB 66	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 67	CAST	CELLAR D5
ST VIGEANS, ANGUS	IB 68	CAST	CELLAR D4
ST VIGEANS, ANGUS	IB 69	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 70	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 71	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 72	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 73	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 74	CAST	CUSTOM HOUSE, LEITH
ST VIGEANS, ANGUS	IB 75	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 76	CAST	CELLAR C2
ST VIGEANS, ANGUS	IB 77	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 78	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 79	CAST	CELLAR D5
ST VIGEANS, ANGUS	IB 80	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 81	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 82	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 83	CAST	CELLAR D2
ST VIGEANS, ANGUS	IB 84	CAST	CELLAR D1
ST VIGEANS, ANGUS	IB 85	CAST	CELLAR D7
ST VIGEANS, ANGUS	IB 86	CAST?	CUSTOM HOUSE, LEITH
STRATHMARTINE, ANGUS	IB 47	STONE	CELLAR D1
STROME SHUNNAMAL, BENBECULA, HEBRIDES(OUTER)	IB 37	STONE	GF-DAS 014
TULLIBOLE, KINROSS	IB 99	STONE	CUSTOM HOUSE, LEITH
UYEA, SHETLAND	IB 18	STONE	CELLAR C1
WHITHORN, WIGTOWNSHIRE	IB 34	STONE	GF DISPLAY 5/11/83
WHITHORN, WIGTOWNSHIRE	IB 35	STONE	CUSTOM HOUSE, LEITH
YARROW KIRK, SELKIRKSHIRE	IB 92	CAST	GF-DAS 003

STONES IN THE NMAS PREHISTORIC TO VIKING SECTION (LOCATION LIST)

STORAGE LOCATION	SITE NAME	COUNTY	ACCESSION	MATERIAL
?	ISLAY	ARGYLL	IB 3	CAST
?	KILBAR,BARRA	HEBRIDES(OUTER)	IB 102	STONE
?	LOCALITY UNKNOWN		IB 55	STONE
?	MEIGLE	PERTHSHIRE	IB 7	CAST
?	MEIGLE	PERTHSHIRE	IB 8	CAST
?	NEWTON	ABERDEENSHIRE	IB 32	CAST
CELLAR ??	ST VIGEANS	ANGUS	IB 62	CAST
CELLAR C1	--	SHETLAND	IB 19	STONE
CELLAR C1	UYEA	SHETLAND	IB 18	STONE
CELLAR C2	ST VIGEANS	ANGUS	IB 76	CAST
CELLAR C3	RIPON	YORKSHIRE?	IB 94	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 66	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 72	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 73	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 77	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 80	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 81	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 82	CAST
CELLAR D1	ST VIGEANS	ANGUS	IB 84	CAST
CELLAR D1	STRATHMARTINE	ANGUS	IB 47	STONE
CELLAR D2	ST VIGEANS	ANGUS	IB 69	CAST
CELLAR D2	ST VIGEANS	ANGUS	IB 70	CAST
CELLAR D2	ST VIGEANS	ANGUS	IB 71	CAST
CELLAR D2	ST VIGEANS	ANGUS	IB 75	CAST
CELLAR D2	ST VIGEANS	ANGUS	IB 78	CAST
CELLAR D2	ST VIGEANS	ANGUS	IB 83	CAST
CELLAR D3	BURGHEAD	MORAY	IB 57	CAST
CELLAR D3	ISLAY	ARGYLL	IB 5	CAST
CELLAR D4	BURGHEAD	MORAY	IB 96	STONE
CELLAR D4	GATTONSIDE,MELROSE	ROXBURGHSHIRE	IB 52	STONE
CELLAR D4	ST VIGEANS	ANGUS	IB 68	CAST
CELLAR D5	ST VIGEANS	ANGUS	IB 65	CAST
CELLAR D5	ST VIGEANS	ANGUS	IB 67	CAST
CELLAR D5	ST VIGEANS	ANGUS	IB 79	CAST
CELLAR D7	ST VIGEANS	ANGUS	IB 85	CAST
CELLAR E1	BURGHEAD	MORAY	IB 56	CAST
CELLAR E2	LASSWADE	MIDLOTHIAN	IB 20	STONE
CELLAR E2	LOCALITY UNKNOWN		IB 51	STONE
CELLAR E4	AITH'S VOE CUNNINGSBURGH	SHETLAND	IB 104	STONE
CELLAR E4	LASSWADE	MIDLOTHIAN	IB 21	STONE
CELLAR E5	ABERNETHY	PERTHSHIRE	IB 98	STONE
CELLAR R1	ISLAY	ARGYLL	IB 4	CAST
CUSTOM HOUSE, LEITH	BALNAHARD,COLONSAY	HEBRIDES(INNER)	IB 42	STONE
CUSTOM HOUSE, LEITH	CASSENDEOCH,OLD LUCE	WIGTOWNSHIRE	IB 50	STONE
CUSTOM HOUSE, LEITH	CASTLE HILL,KINTORE	ABERDEENSHIRE	IB 23	STONE
CUSTOM HOUSE, LEITH	CRAIGNARGET,GILLESPIE,GLE NLUCE	WIGTOWNSHIRE	IB 43	STONE
CUSTOM HOUSE, LEITH	DRUMMORE	WIGTOWNSHIRE	IB 33	STONE
CUSTOM HOUSE, LEITH	EILEAN MORE	ARGYLL	IB 17	STONE
CUSTOM HOUSE, LEITH	FINDLARIG,STRATHSPEY	INVERNESSHIRE	IB 11	STONE
CUSTOM HOUSE, LEITH	FIRTH	ORKNEY	IB 24	STONE
CUSTOM HOUSE, LEITH	GOSMOUNT,COLDINGHAM	BERWICKSHIRE	IB 44	STONE
CUSTOM HOUSE, LEITH	GOVAN,GLASGOW	RENFREWSHIRE	IB 12	CAST
CUSTOM HOUSE, LEITH	INCHCOLM	FIFE	IB 88	CAST
CUSTOM HOUSE, LEITH	INVERALLAN,STRATHSPEY	INVERNESSHIRE	IB 97	CAST
CUSTOM HOUSE, LEITH	KINGOLDRUM	FIFE	IB 40	STONE
CUSTOM HOUSE, LEITH	KINGOLDRUM	ANGUS	IB 41	STONE
CUSTOM HOUSE, LEITH	KIRKMADRINE,STRANRAER	WIGTOWNSHIRE	IB 91	CAST
CUSTOM HOUSE, LEITH	LIBERTON TOWER,EDINBURGH	MIDLOTHIAN	IB 29	STONE
CUSTOM HOUSE, LEITH	MILTON,LESMAHAGOW	LANARKSHIRE	IB 30	CAST
CUSTOM HOUSE, LEITH	MONIEFIETH	ANGUS	IB 25	STONE
CUSTOM HOUSE, LEITH	MONIEFIETH	ANGUS	IB 26	STONE
CUSTOM HOUSE, LEITH	MONIEFIETH	ANGUS	IB 28	STONE
CUSTOM HOUSE, LEITH	MULL OF SUNNONESS	WIGTOWNSHIRE	IB 16	STONE
CUSTOM HOUSE, LEITH	ST ASAPH'S,BERNERAY	HEBRIDES(OUTER)	IB 31	STONE
CUSTOM HOUSE, LEITH	ST NINIAN'S CAVE,PHYSGILL	WIGTOWNSHIRE	IB 54	STONE
CUSTOM HOUSE, LEITH	ST TARAN'S,TARANSAY	HEBRIDES(OUTER)	IB 49	STONE
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 60	CAST
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 61	CAST
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 63	CAST
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 64	CAST
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 74	CAST
CUSTOM HOUSE, LEITH	ST VIGEANS	ANGUS	IB 86	CAST?
CUSTOM HOUSE, LEITH	TULLIBOLE	KINROSS	IB 99	STONE
CUSTOM HOUSE, LEITH	WHITHORN	WIGTOWNSHIRE	IB 35	STONE
GF DISPLAY 5/11/83	WHITHORN	WIGTOWNSHIRE	IB 34	STONE
GF-DAS	FORTEVIOT	PERTHSHIRE	IB 36	STONE
GF-DAS 001	CATSTANE,KIRKLISTON,EDINB URGH	MIDLOTHIAN	IB 89	CAST
GF-DAS 003	YARROW KIRK	SELKIRKSHIRE	IB 92	CAST
GF-DAS 005	KIRKMADRINE,STRANRAER	WIGTOWNSHIRE	IB 90	CAST
GF-DAS 008	PRINCES ST GARDENS,EDINBURGH	MIDLOTHIAN	IB 1	STONE
GF-DAS 009	ST PETERS CHURCH, S RONALDSAY	ORKNEY	IB 2	STONE
GF-DAS 014	STROME SHUNNAMAL, BENBECULA	HEBRIDES(OUTER)	IB 37	STONE
GF-DAS 015	CASTLE HILL,KINTORE	ABERDEENSHIRE	IB 22	STONE
GF-DAS 016	CLUNE,DORES	INVERNESSHIRE	IB 38	STONE
GF-DAS 017	KNOCK-AN-FRUICH,GRANTOWN	INVERNESSHIRE	IB 10	STONE
GF-DAS 018	BURGHEAD	MORAY	IB 95	STONE
GF-DAS 023	HODDAM	DUMFRIESSHIRE	IB 9	STONE
GF-DAS 026	PAPIL,BURRA	SHETLAND	IB 46	STONE
GF-DAS 030	KINGOLDRUM	FIFE	IB 39	STONE
GF-DAS 031	DUNFALLANDY	PERTHSHIRE	IB 53	CAST
GF-DAS 035	MONIEFIETH	ANGUS	IB 27	STONE
GF-DAS 037	ST ANDREWS	FIFE	IB 13	CAST & SARCOPHAGUS (PORTION)
GF-DAS 037	ST ANDREWS	FIFE	IB 14	CAST & SARCOPHAGUS (PORTION)
GF-DAS 037	ST ANDREWS	FIFE	IB 15	CAST & SARCOPHAGUS (PORTION)
GF-DAS 038	DULL	PERTHSHIRE	IB 58	STONE
GF-DAS 040	GELLYBURN,MURTHLY	PERTHSHIRE	IB 101	STONE
GF-DAS 043	KILDALTON,ISLAY	ARGYLL	IB 6	CAST
GF-DAS 045	RISKBUIE,COLONSAY	HEBRIDES(INNER)	IB 87	CAST
GF-DAS 047	FLOTTA	ORKNEY	IB 48	STONE
GF-DAS 049	GLENLUCE CHURCHYARD	WIGTOWNSHIRE	IB 45	STONE
GF-DAS 055	CUNNINGSBURGH	SHETLAND	IB 103	STONE & RUNES
GF-DAS 100	OVER KIRKHOPE,ETTRICK	SELKIRKSHIRE	IB 100	STONE
GF-DAS DISPLAY CASE	INCHMARNOCK,BUT	ARGYLL	IB 93	STONE
WP FLOOR 2	ST VIGEANS	ANGUS	IB 59	CAST