

Quest for the golden apples of the Hesperides

Hypermedia design for an archaeological exhibition

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Introduction

The Euesperides project focuses on the hypermedia presentation of the history and archaeology of the ancient Greek colony of Euesperides in North Africa. The application is based on a part of the Classical collection of the Ashmolean Museum, Oxford and will be used for public information and the interpretation of finds during a temporary exhibition opening at the Museum of Oxford in autumn 1995.

The Euesperides prototype, like all hypermedia programs, was not developed in vacuum, but was influenced by a wide spectrum of factors, such as the original archaeological information upon which the content of the program was based, as well as the institutions related to the project affected directly or indirectly its design and production. This background information is outlined in the first part of the paper, which is followed by a description of the program's structure and the main design issues involved in its production.

The museums involved

The exhibition organized by the Ashmolean Museum is titled "From the Gardens of the Hesperides: The excavation of an ancient Greek city in North Africa" and will run from September to October 1995. The Ashmolean Museum is part of the University of Oxford and the oldest public museum in Britain, founded in 1683. Due to the major rebuilding currently taking place at the Ashmolean, the exhibition will be housed at the Museum of Oxford, a smaller, local authority museum which was created in the 1960s and is run by the Oxfordshire County Council.

The two museums have different histories, characters, types of collections, and display methods. Their collaboration for the Euesperides exhibition has proved very interesting, with useful lessons gained on both parts. The exhibition is, for both institutions, the first venture in the use of computer interactive technology for public interpretation. The Euesperides prototype was developed as part of a DPhil research project at the University of Oxford, in order to explore the possibilities of interactive multimedia for presenting archaeological information to a wide audience and provide increased access to museum collections. Neither museum is heavily involved in information technology, though several members of staff in both museums are following this experiment with great interest.

The site

Euesperides is a little-researched and relatively unknown site on the outskirts of modern Benghazi. It was the westernmost Greek city of ancient Cyrenaica, the area on the north coast of modern day Libya between the gulf of Great Syrtis and Egypt. The city had a life span from the sixth to the mid-third century BC, before being deserted in favour of the newly-founded Berenice which was nearer to the sea.

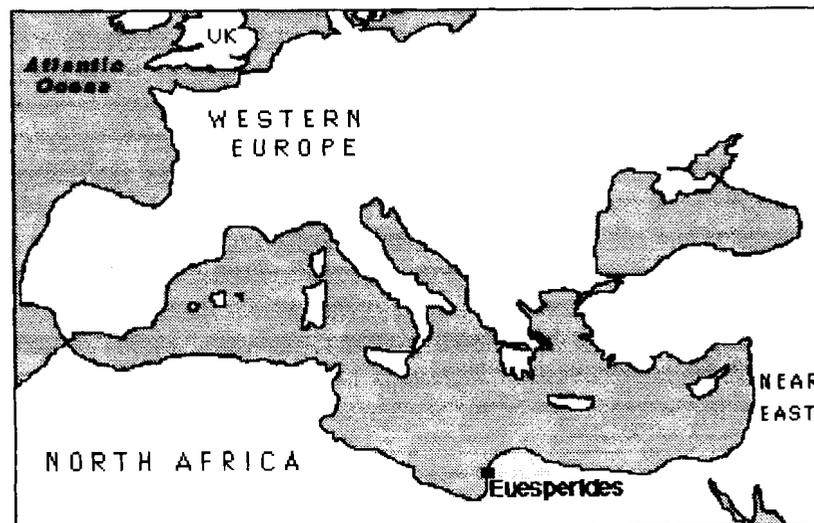


Fig. 1 Euesperides' location

Euesperides doesn't figure large in history and little information, literary or archaeological, survives today about the city's past. Certain Greek myths are related to the city, like the one about the gardens of the Hesperides with their golden apples which are placed in the Euesperides' vicinity by writers of later antiquity.

The Ashmolean Museum participated in the first series of excavations of the site in the 1950s and today holds part of the finds.

The program

The main aims of the Euesperides hypermedia program are the following:

1. Create a multimedia information base concerning the history and archaeology of Euesperides by organizing disparate types of data (textual and visual) in a coherent way.
2. Interpret and contextualize the specific collection of objects from Euesperides in the care of the Ashmolean Museum.
3. Invite a wide range of potential museum visitors to active participation and free exploration of the program.
4. Explain aspects of archaeological theory and practice and stimulate an interest in Classical Greek life, but also in museums and archaeology in general.

3.1 Choice of the material and scope of the application

The finds from Euesperides are among the few objects from the Ashmolean's Greek collection that came from a systematic excavation. Unlike most of the other objects in the museum's care, which come from donations or auction houses, the material from Euesperides was collected as archaeological evidence during the excavation of an ancient city. It thus offers the possibility to trace the location of finds and to examine a wider context and the inter-relationships between the objects and other information from the site. The Euesperides example provides a good opportunity to offer to the public some information about archaeological methods and principles and explain how archaeologists combine material evidence, primary sources, and excavation results to draw their conclusions.

As is often the case with archaeological and historical research, the history of Euesperides is very fragmentary, with few remaining sources offering information about the city's past. The excavations conducted at the site from 1952 to 1954 were not very extensive and were often hindered by difficulties and particular circumstances (Vickers et al. 1994). Most importantly, their results were never published. Unfortunately, this kind of situation is not uncommon in the field of archaeology. The organization and study of this information acquires particular importance in view of the fact that the rapid expansion of modern Benghazi has destroyed part of the site.

Despite all these problems, and perhaps because of them, Euesperides presents a challenge for the hypermedia presentation and interpretation of its history and archaeology. This is not a case of

magnificent discoveries or numerous impressive finds. However, there is great potential for using the computer to present parts of the continuous history of a Greek colony, show aspects of its everyday life, investigate the development of the city's plan and architecture, and also explain aspects of archaeological work, and show the importance of studying the past today.

This potential would have been difficult to exploit with more traditional and static means of museum display. In this case the computer application is used as a means of organizing disparate forms of information, interpreting them, and presenting them in an easily accessible and attractive way.

Archaeologists are often accused of addressing a very limited and specialized audience ignoring their wider public which feels alienated by scientific jargon and the display of objects without any interpretation. Excavators, researchers, and museums curators often fail to show the relevance and importance of their work and finds to the wider public. Interactive multimedia systems have the potential to provide a tool for bridging this gap by presenting specialized information in an approachable way, visualizing abstract concepts, and engaging the user in a participatory exploration. Hypermedia's non-sequential, non-linear structure which allows the user to control the flow of the program, and retrieve from it the information which is of greatest interest made it a suitable medium for this type of presentation. The program will be an integral part of the exhibition, next to the objects; it will offer information at various levels and give visitors the opportunity for comparisons and examinations of different features.

The finds from Euesperides, if they were to be exhibited in a museum gallery on their own, could not offer even to the specialist a clear, comprehensible picture of the site's history or of the great educational potential it offers. The program drew material from the remaining excavation archive which was only recently acquired by the Ashmolean: location maps, siteplans and sections of the excavated areas, photographs, drawings of the finds, and notes from the excavators offered the key for deciphering the role and context of the objects.

3.2 Intended Audience

The Euesperides program is targeted to the general public. This will most likely include local visitors from Oxfordshire, family groups, school parties, tourists, and students from the University of Oxford. Some of these visitors will be unfamiliar with computers and therefore, the interface has to be intuitive and simple.

For teachers and primary school pupils many aspects of the Euesperides program are linked with issues and themes about ancient Greece which, according to the British curriculum, students between age 9 and 11 should be learning about. They should also be taught 'how to find out about aspects of the periods studied, from a range of sources of information, including documents and printed sources, artefacts, pictures and photographs, music, and buildings and sites'. Use of information technology is

also encouraged. A school visit to the exhibition and use of the program can meet a number of these requirements, as well as offering information relevant to a broader curriculum. It will touch not only on history, but on geography, art, science and technology.

The program does not attempt to be a tool for specialized research, but includes features which would be of interest to a more knowledgeable and interested audience. Although using simple language and inviting presentation style, the program also presents a quantity of unpublished archaeological information, relevant to a variety of specialities.

While in reality there is no such thing as the typical visitor, the program includes rich material and a variety of features which can interest and appeal to a wide span of people. Although it is acknowledged that the targeted audience is very wide, encompassing most of the potential museum visitors, this rather ambitious choice was made in order to test in practice if it is a viable one and investigate the potential and effectiveness of the hypermedia prototype.

Museums have been warned against trying to address all their audience with one multimedia application (Wanning 1991). On the other hand, given the effort and resources required for multimedia production, it is desirable to try to make the most out of a single program. Carefully structured applications with a well-designed user interface can often succeed in accommodating audiences with very different needs.

3.3 Software and Hardware

The program was designed using Apple's HyperCard version 2.2 and runs on Macintosh computers. The vision of HyperCard's first creators was to give artists, content specialists, and educators a flexible tool with which to express their ideas without spending too much time and effort on technicalities. Since the Euesperides project was not going to include any experienced computer programmer, this feature was important. Additionally, from the final user's point of view (that of the museum visitor in this case) HyperCard applications could be designed in a clear and user-friendly manner, so that no computer literacy is necessary to navigate and use them. Other features include the ability to create stand-alone applications, and the ease of adding new cards and information. These characteristics, as well as the low cost of the product and the fact that no subsequent license fees are required, were the main criteria for choosing HyperCard as an authoring tool.

Experience showed that although it is true that very simple applications can be designed quickly and easily by novices, a knowledge of scripting and advance use of HyperTalk (the application's programming language) is required for more complex designs. HyperTalk follows to a great extent the grammar and syntax of the English language, but still requires time and practice for a non-expert to learn and exploit to its full power and flexibility. The well-established international network of

HyperCard users, and the availability of relevant resources, special interest electronic lists, and documentation proved very helpful in this direction.

HyperCard's operating method is based on the metaphor of a card which is linked to a screen of integrated information. Each card can contain text, graphics, and buttons which can be selected to play sounds and video sequences and assist navigation. A collection of cards forms a stack, which is the basic HyperCard application.

HyperCard's main drawback is its idiosyncratic support of colour, which remains cumbersome and less integrated than in other multimedia authoring packages, even after the release of version 2.2 of the program, which provides 'Colour Tools'.

For its greatest part, the program was developed on a PowerBook 160 (with 8 MB RAM and a 120 MB hard disc) attached to a 14-inch colour monitor. At the moment it uses a mouse as a pointing device, but it is hoped that we will be able to obtain a touchscreen for the exhibition, so that visitors unfamiliar with computers will not have to master the use of a mouse before using the program for the first time. The portability of the computer proved a considerable advantage when setting up demonstrations and evaluation sessions throughout the program's development.

The pictures used in the program were digitized using a Microtek colour flat-bed scanner (SM IIXE) and were edited with Adobe Photoshop. The line drawings and excavation plans were saved as bitmap graphics, since this is the type supported by HyperCard and is easy to manipulate. The bad quality of a large part of the originals from the excavation archive presented some difficulties and required time-consuming editing. The images of the coins were captured with a JVC digital video-camera (KY-F30) connected to a Macintosh Quadra 700 and using OptiLab to control the camera's operation. Copies of the image files were kept at two different resolutions, a higher one at 300 dpi (dots per inch) for archival purposes, and a lower at 72 dpi. The latter was the one used at the application, since it is less memory-hungry, and is the maximum resolution currently supported by the computer monitor.

The display and positioning of picture files in the program are controlled by the external command (XCMD) 'picture'. This is an additional utility written in traditional computer language, which can be called up from HyperTalk scripts, but remains transparent to the users. It places the image file on top of the HyperCard application, but gives the impression of being an integral part of the card.

The Euesperides prototype does not claim to be a breakthrough in state-of-the art multimedia technologies. It does not include complicated programming commands, expensive equipment, or dazzling graphics. The main emphasis of the project is on the effects and use of the application and its role in a museum environment, rather on the technological and production aspects. Using standard software and hardware, it is closer to the reality of most museum and academic work, where professionals are usually asked to work within very tight limits of finances and time.

3.4 The program's structure

The Euesperides program is organized in a hierarchical fashion, but with certain areas following the linear and network models. In most parts the information is grouped in main themes which can lead to more detailed sub-groupings and paths. The number of choices available to the users, and the structured, logical hierarchy which allows them to quickly grasp the way the information is organized made this model more suitable for a public information system. An effort was made to keep the structure clear and simple, but also flexible enough to effectively organize all necessary information.

The main themes started emerging as the available material were studied. It seemed appropriate to distinguish, and correlate the information about the Ashmolean Expedition (the main theme of the exhibition) with the background information about Euesperides' history. Therefore, although there are a few clearly separated branches with a number of hierarchical sub-menus, the network model with its freer association of information of equal importance, was also applied to link closely related nodes.

By consistently using the 'Next' button, the user can navigate parts of the program in a linear fashion. Although this does not seem to follow the basic hypertext principle of non-linearity, by incorporating linear sub-structures, the program provides consistent navigation and continuity between information chunks (Garzotto et al 1991).

3.4.1 Introduction to the program

After the opening screen of the program and a card with a short description of its aims, the 'Main Options' menu appears (fig. 2).

The Main Options are:

- 1) **Where is Euesperides?** (an 'Introduction' to the city, its history and re-discovery).
- 2) **What was Euesperides?** (the 'History' section of the program with information from the primary sources, e.g. pottery, inscriptions, coins).
- 3) **How did we find out about Euesperides?** (the 'Archaeology' part, which offers information about the excavation of the site and the finds).
- 4) **What did you learn about Euesperides? ('Quiz')**. This new button leading to the 'Quiz' appears at the 'Main Options' screen after several parts of the application have been viewed. The 'Quiz' includes ten multiple choice questions which relate to the information presented in the program.

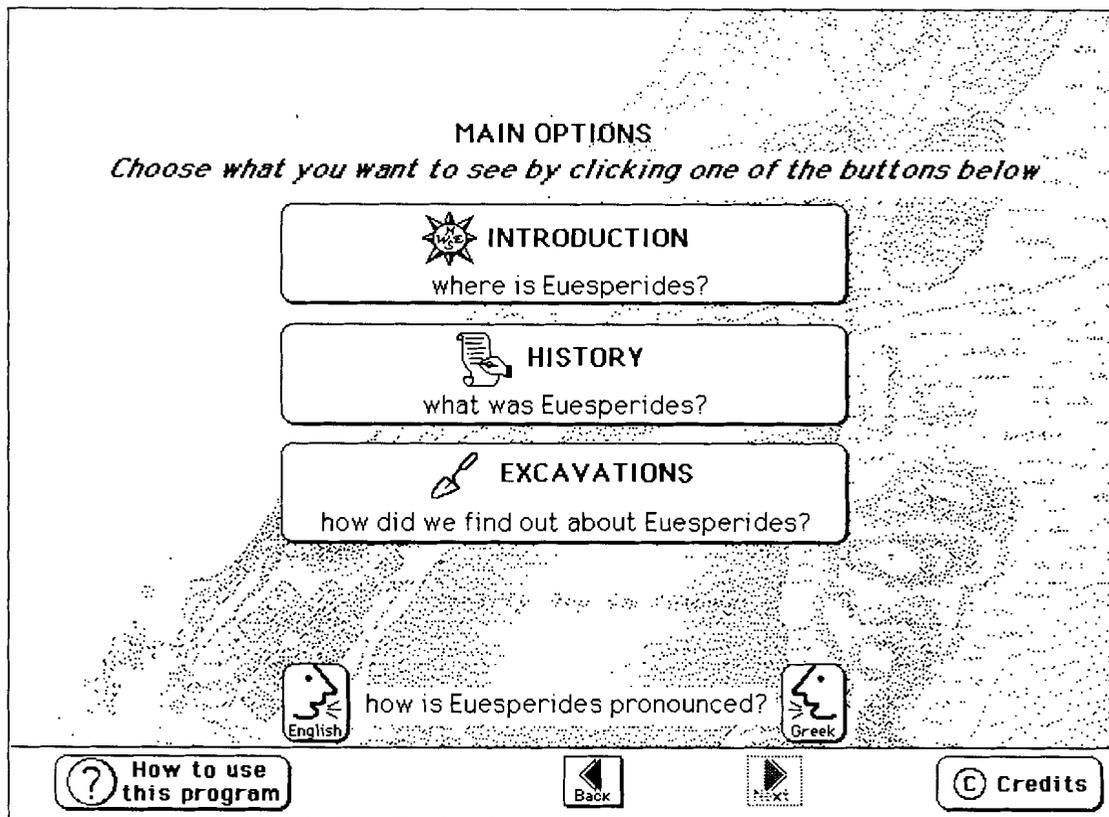


Fig. 2 The 'Main Options' card of the Euesperides program

3.4.2 Introduction to Euesperides

This part includes location maps and brief details about the city and its history, the development of the site, and its re-discovery in modern times. It would be particularly useful to visitors unfamiliar with the subject and is intended as an orientation aid, placing the Euesperides on the map and offering a glimpse of what will follow.

3.4.3 History

For this section the metaphor of an imaginary museum has been used to organize the available information about the city's past. When the graphic representation of the museum building is clicked, its doors open up to a floorplan where the different galleries are active buttons leading to the relevant sections (fig. 3). The various galleries present pieces of the puzzle, different sources of evidence that help us reconstruct Euesperides' history.

The galleries named 'Pottery', 'Coins', and 'Inscriptions' present the information which we can obtain about the city from the surviving material culture. The gallery of 'Myths' presents the myths

associated with the city. The 'Library' is organized in two rooms, one related to 'Dates & Facts', and the other entitled 'Ancient Writers'.

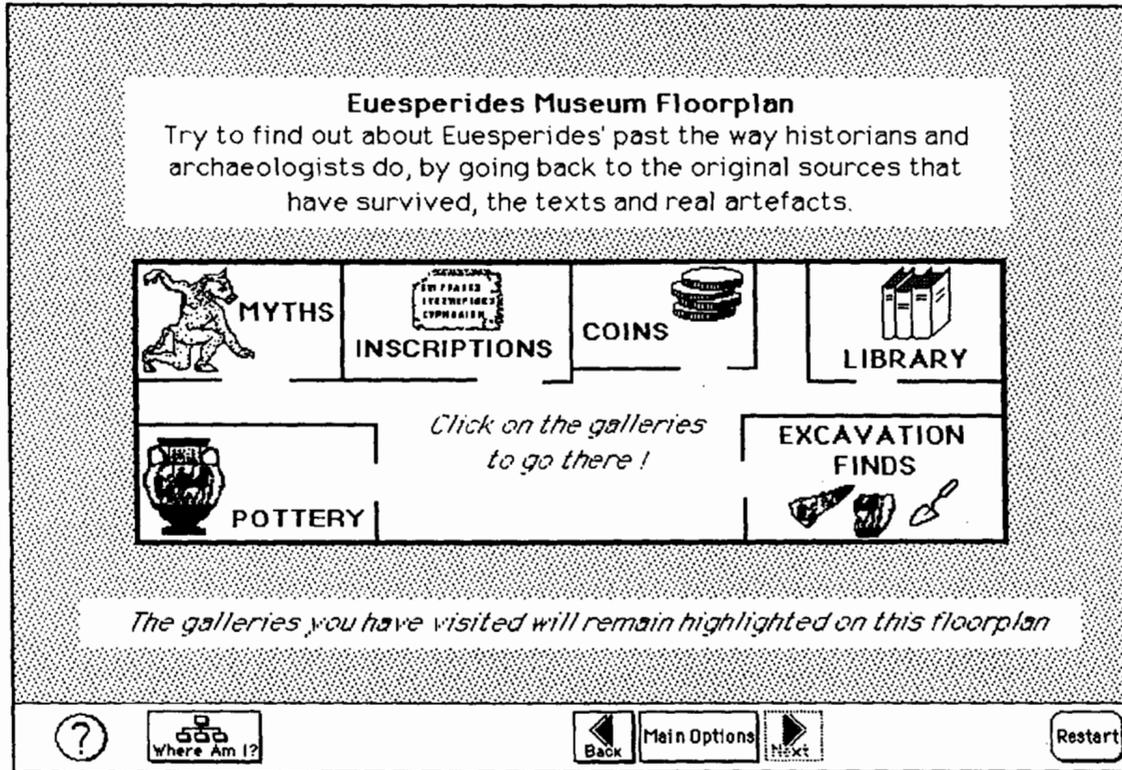


Fig. 3 Floorplan of the Imaginary Museum of Euesperides used as menu for the 'History' part of the program

The room of 'Dates & Facts' uses the idea of a timeline. The user can point to any period to see the main historical and political events of that time related to Euesperides and Cyrenaica. The main events of world history are also given below the timeline as a point of reference, in order to offer a more general perspective.

The second option of the 'Library' section is entitled 'Ancient Writers' and leads to a graphical representation of a library shelf with the books of all the ancient travellers and historians that refer to Euesperides, like Herodotus, Pindar, and Thucydides. By clicking on the icon of any book, the user can view the relevant text in Greek together with an English translation. The Greek text is presented on the graphic design of a papyrus which can be scrolled down to show more lines. The texts can also be explored by subject, either by the main historical facts listed chronologically or by a menu of themes referring to geography and economy.

The gallery of 'Excavation Finds' is an explicit link to the other branch of the program, the 'Excavations' section. It leads to a card with the representation of a 'Museum case', where small images of objects found during the excavation of the site are displayed. These can be selected to show additional information about the specific object.

3.4.4 Excavations

This part of the program uses mainly material from the Ashmolean excavations. A drawing of the siteplan is used as menu with flashing arrow buttons pointing to the parts of the plan where additional information is available (fig. 4). Archaeological methods and terms, like the grid system, trial trenches, and stratigraphy are explained in this section, while excavation photographs, drawings, and plans give an account of the archaeology of the city.

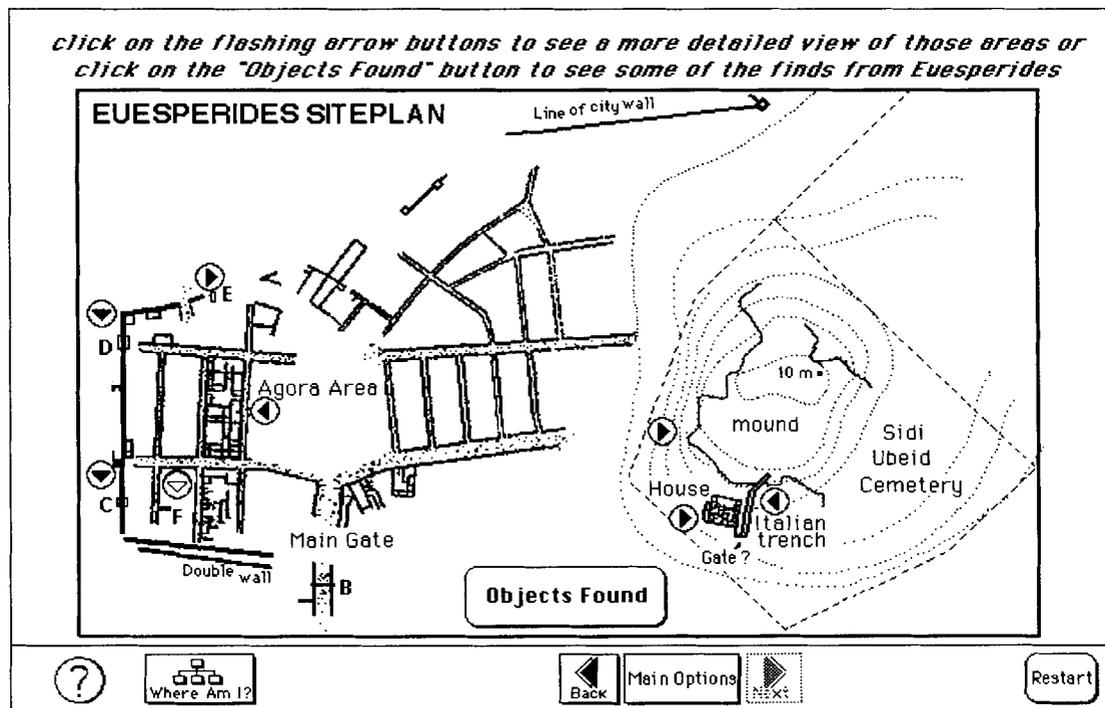


Fig. 4 Siteplan of Euesperides used as menu for the 'Excavations' part of the program

From the siteplan the user can also select to view some of the site finds, displayed in the 'Museum Case' described above. The 'Museum Case' acts as a link which joins the two main branches, 'History' and 'Excavations' at a deeper level of the program's structure.

3.4.5 Program plan

The 'Program Plan' is a diagram where the main parts of the program are represented graphically as rectangular boxes (fig. 5). These are also active areas which can be clicked to lead to the relevant part indicated by their name. The box representing the card viewed last, remains highlighted to offer a visual cue to the user and assist orientation. This part of the program can be accessed from all sections.

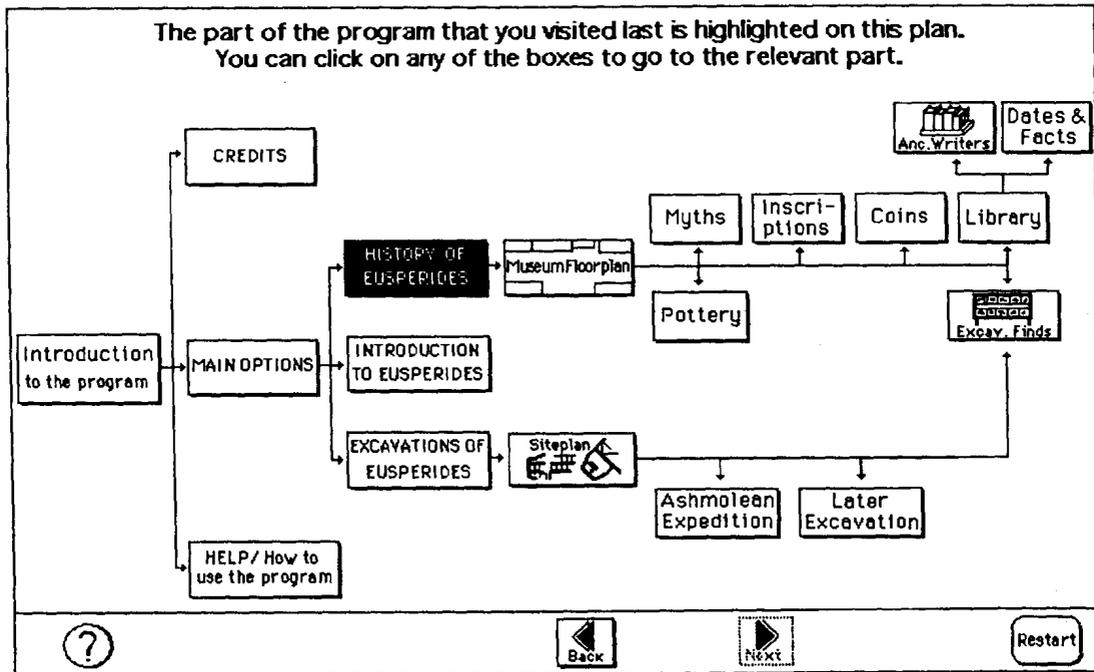


Fig. 5 The 'Program Plan' shows a diagram of the program's general structure

3.5 Main buttons

Consistently placed at the bottom of all cards of the program, the navigation buttons are separated by a line from the active area on the screen where new information is displayed. Apart from the buttons for 'Next' and 'Back' (the latter taking the users to the card visited previously, allowing them to retrace their steps), 'Restart' leads back to the opening screen of the program.

Another button titled 'Where Am I?' uses the icon of a diagram and takes the user to the 'Program Plan', described above.

Information on “how to use the program” is being limited to one screen, which was deemed more appropriate for a gallery application, as users need to grasp quickly how the program works. Instructions are offered where necessary throughout the program, while this basic set of guidelines is accessible through the ‘Help’ button (illustrated with a question mark) from every part of the program.

After testing various users and observing similar applications, it was decided to use icons, as well as textual descriptions for the buttons to ensure clarity and proper understanding of the buttons’ role. Although icons can act as an attractive visual cue of the buttons’ function, they can often be perceived differently by many users. An evaluation of the usability of Glasgow Online (the hypertext tourist information system designed in 1988, when Glasgow was European City of Culture) showed that many of the icons used by the system were interpreted in different ways by the participants in the study (Hardman 1989).

In the ‘Help’ section, it was felt that further explanation of the function of the buttons was needed. Using HyperCard’s programming commands, a text box describing the exact role of each button was made to appear every time the user dragged the cursor on the area occupied by the button (see fig. 6 below).

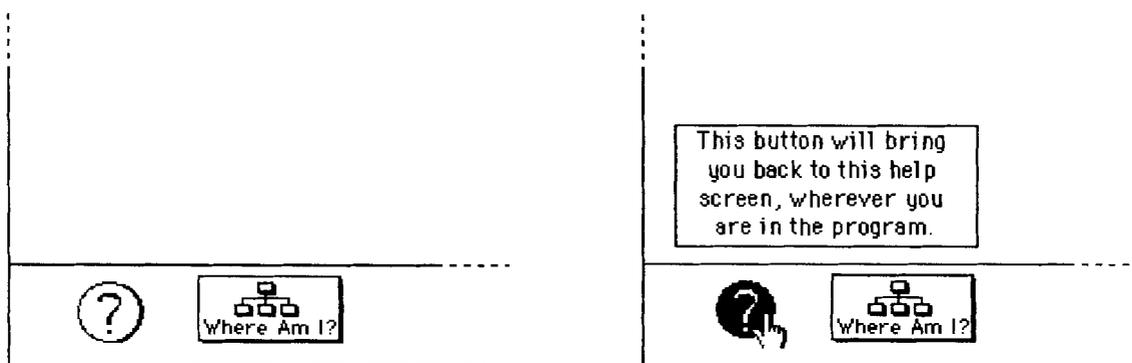


Fig. 6 At the ‘Help’ section, when the user drags the pointer over a button, it gets highlighted and a textual description of its function appears on screen.

4. Design Issues

‘Good design must communicate, not just dazzle. It must inform, not just impress’

(Apple Computer 1987, 9)

The design of the program’s interface refers to the way it communicates its content to the users, the form used to express ideas and present information. It is important to set some basic guiding principles from the start (according to the specific aims of the program and the environment for which it was created), but also to follow the design rules which are becoming generally accepted, such as the Apple Human Interface Guidelines (Apple Computer 1987). The basic design principles of the Euesperides program are outlined below, together with a number of examples of the way these were applied in practice.

As with all hypermedia interactives, visual elements and graphic presentation played an important part. The combination of pictures and text on screen had to assist clear communication and understanding, rather than be purely cosmetic. An effort was made to encompass visual consistency, simplicity, and clarity in the design.

4.1 Metaphors from the real world

The Euesperides program uses several real world metaphors, such as the metaphor of an imaginary museum of Euesperides which opens its doors to show its floorplan, for organizing the ‘History’ part; or the use of a bookshelf as menu in the ‘Ancient Writers’ section, leading to the work of different historians and geographers.

These metaphors were used so that museum visitors, even those unfamiliar with computers, could make a connection with the real world and their everyday life experiences. This is based on the ‘idea of creating interface metaphors that can anchor users’ understanding of the computer to something with which they are already familiar’ (Mountford 1990, 25). In most cases they are not exact representations or realistic illustrations, but rather a means of communicating ideas clearly and quickly, without taking the metaphor to the extreme.

4.2 User control and interactivity

The program strives to take advantage of hypermedia’s ability for interaction, to offer the initiative and choice to the users. It was felt necessary to explore the potential of the medium in contrast to the linearity of other museum interpretation methods, like video recordings, slide shows, and guided tours. The users control the flow of the program with the buttons they click and the selections they make. They can stop and restart the program at any point, or return to any part of their choice. Already from

the beginning of the program, when viewing the title card, the users are asked to make a decision and are invited to click on the screen to start the program.

Although the program follows a certain hierarchy and the options available are predetermined by the designer, it is still the user and not the computer who is placed at the driving role. It was felt that unstructured, free exploration, and the ability for visitors to alter parts of the program and create their own links, was not suitable for the museum environment and the aims of this project.

People expect their actions to have physical results, and they want their tools to provide feedback. In the program this is provided visually, and in some cases, audibly. For example, when users click on the button with the icon of a camera (indicating that a relevant photograph is available), they hear the sound of a camera shutter opening and closing; buttons become highlighted, when they are selected; in the 'Quiz', users receive also aural feedback about right and wrong answers; when a button is not available, they are informed by the grey shade it acquires (e.g. the 'Next' button appears greyed, as in fig. 6, when no further information follows in that particular section of the program).

4.3 See-and-point

The users of the program interact directly with the screen. In the first stages of development and testing the pointing device was a mouse or a trackerball. Even without a touchscreen, we observed that users unfamiliar with computers, used both the mouse and the trackerball with ease after the first few moments. Observing other visitors in the exhibition or getting guidance from members of the group that came to the museum together, can help novices overcome initial hesitations.

The various options of the program can be selected through menus presented graphically on the screen. There are two kinds of see-and-point navigation options in the application: those that are available at all times, like the permanent navigation buttons, and those that are specific to certain cards. For example, in the 'Excavations' part, the card with the graphic image of Euesperides' siteplan is used as a menu with flashing arrow buttons leading to more archaeological information.

There is no need for the users to remember and type anything; they can instead point at what they see in order to choose objects, activities, and options. Wherever necessary, instructions are given on screen. The users are not expected to recall, but rather recognize the visual cues.

4.4 Consistency

An effort for coherence and consistency was made throughout the program. Consistent design was applied in the overall graphic look, in the grouping and placement of buttons, in the visual and audio feedback, the background of cards with similar functions, and the structure of the stacks. For example, consistent use of HyperCard's various visual effects, the animations that appear often during the

transition from one card to another, assist the understanding of the structure of information and the direction of movement. When moving from a general menu card to one with more specific information, the visual effect of 'zooming in' is used, while 'zooming out' is used respectively, when the transition is from a specific card to a more general one. Additionally, the visual effect 'dissolve' is used to convey a purposeful slowing when moving to a card of different content.

4.5 Aesthetic integrity

Aesthetically pleasing and attractive screens encourage visitors to pay attention to the information presented. Finding out about an excavation and learning the history of a city need not be dull and difficult. On the other hand, the program is designed as an aid and a component of a museum exhibition, attempting to complement and enhance, but not replace the objects. For this reason, the emphasis is not on creating a gripping presentation with dazzling visual effects and overpowering graphics; instead, the aim is to create an informative display which is integrated with the exhibition and its communication approach.

Small quantities of text are placed on each card, combined with graphics and images, where appropriate. We tried to keep the design of the screens uncluttered by placing the main buttons at the bottom, clearly separated by the area where the information is displayed. Additional information on specific terms is layered, hidden in boxes which appear only after the relevant word is selected by the user.

The application makes discreet use of colour, as technical considerations (primarily the effect that the addition of colour has on the speed with which the program operates) restricted its extended use. The program does not incorporate any video sequences, and sound is used sparingly so as not to become obtrusive in a public gallery. It was felt that the use of video clips was not justified by the type of information available and the content of the program, and would place high technical demands, without adding any useful information.

Animation can have a powerful impact on users of hypermedia programs. When used inappropriately, it can frustrate and confuse, but if it is integrated carefully in the application and its content, it can prove a very effective way of communicating, informing, and entertaining. Properly animated sequences are technically very demanding. In the Euesperides program we used instead, the illusion of movement with cards fading into each other. For example, in the 'Excavations' section the siteplans from different phases were superimposed and made to fade into each other, simulating the development of Euesperides through time.

4.6 User testing

Testing with users throughout the design process offered valuable feedback. Observing people of different ages and backgrounds using the program at both formal and informal settings identified problematic features and areas and provided ideas for improvement. Various methods were used during this process. For example, we encouraged people to 'think aloud' as they navigated through the application, had them work in groups of two, thus allowing them to discuss with each other about what they saw and did — and in larger groups, where decisions about how to proceed were made collectively by observing and taking notes on the way they used the program. After having used the prototype, users were asked to complete questionnaires.

When testing the effectiveness of interface design of museum interactives, empirical observation with real users appears to be more important than any laboratory study, in which users are asked to perform pre-determined tasks. As Nielsen and Lyngbaek put it:

'Since one of the main ideas behind hypertext is to empower users to navigate an information space according to their own individual wishes and at their own speed, we felt that it is important to look at people using hypertexts in their own natural environment' (1990, 64).

In the case of the Euesperides prototype, it was not possible to carry out the formative evaluation in the exact natural environment of the program, since the exhibition had not opened yet. We were nevertheless aware of the issues and advantages related to naturalistic inquiry (Neuman 1991) and evaluation in a natural setting. For this reason we conducted most of the evaluation sessions in the museum environment with groups which had just visited the ancient Greek collections. Wherever possible, we tried to give to the users an idea of how the exhibition would look by setting up a small display of objects from Euesperides next to the computers.

4.7 Navigation methods

When using other information and communication media people get physical cues about the information they have covered and the amount left to see. (e.g. books have page numbers and table of contents; with a tape, one can see it winding from one reel to another as it is being played). With hypermedia programs it is necessary to develop and apply other navigation and orientation methods.

A number of different ways have been used in hypermedia programs to address the following user needs (Apple Computer 1989, 9):

- Context: What's in this program?
- Location: Where am I now within the program?
- Destination choices: Where can I go?
- Travel methods: How do I get there?
- Progress indicators: Where have I already been?

In the Euesperides program various navigation methods have been used, with often a single device addressing more than one of the needs described above. An immediate feeling of context is given at the beginning of the program, after the opening screen, when the main subject and scope of the application are explained. Additionally, the 'Main Options' card (fig. 2) as well as the menus at the other sections of the program offer information about the available choices and what is included.

Cards like the 'Main Options' one, are important parts in the hierarchy of the program and play the role of 'landmarks'. They can be accessed by buttons with icons simulating the characteristic visual metaphors of those cards. For instance, in the 'History' section, after clicking on the 'Museum Floorplan' to visit the various galleries, a button with a small icon of the floorplan is consequently placed at the bottom of the screen. In order to give another orientation aid, the gallery being visited is darkened at the 'Floorplan' button. By clicking on this 'Floorplan' button, users can return to the 'Museum Floorplan' screen (fig. 3). Similar buttons are used in the 'Excavations' part, where a button with the icon of the siteplan leads to the siteplan menu (fig. 4); in the 'Ancient Writers' section, to lead to the graphical menu with the writers' bookshelf; at the 'Excavation Finds' section, to lead to the 'Museum Case'. To maintain consistency, these main 'landmark' buttons use the same icons also when incorporated in the overview diagram of the application at the 'Program Plan' (fig. 5).

The 'Program Plan' card is the main component for giving an idea of context, as well as satisfying simultaneously other needs. For example, the highlighted box which represents the card visited last, indicates the position of the user within the stack; the other boxes of the plan are also active buttons outlining the available destination choices; and the caption at the top of the card explains the travel method, in this case a simple click on any box of the diagram. This feature of the program has proved very popular with various users during evaluation and testing. In a visually clear and simple way, the 'Program Plan' assists orientation and acts also as a navigation tool for all parts of the application. Mechanisms of this kind, such as overview diagrams assist concept mapping in a graphic way and are important for applications organized in a hypertext fashion in order to prevent the user from getting 'lost in hyperspace.'

5. Further plans and questions to be asked

Apart from carrying out formative evaluation and user testing mainly to improve the design of the application, an extensive evaluation study will be conducted when the exhibition opens in September.

Conducting summary evaluation, a survey of the use of the Euesperides program by the visitors in the gallery, is an important part of the project. Using a combination of methodologies, interviews, observations, visitor tracking, and computer recording of users' interaction, the survey will examine how the program is being used, define the profile of the users, and assess whether it affects the atmosphere in the gallery and visitor flow. It will investigate the common fear of many curators, that multimedia will replace the experience of viewing the real objects in the galleries, and will attempt to answer a number of questions:

- How does the program relate to the objects on display?
- What do people learn from the program?
- How does it affect the way visitors view the gallery?
- Do visitors spend more time with the objects after using the application or do they get distracted and absorbed by the novelty of the technology?
- Does the program create a positive attitude towards archaeology and museums?
- What conditions can make the use of the program more effective?
- What is the effect of the program on different visitor groups?

Recently multimedia interactives have started spreading in museums and cultural organizations, opening up a range of impressive opportunities. Their application affects the whole concept and role of the traditional museum, but also raises a number of important issues that need to be carefully examined. Critical assessment and in depth evaluation is, unfortunately, lacking in many current applications, as it requires specialized staff and is demanding of resources and time. However, it is a vital step, if we want to understand and make optimum use of these powerful tools.

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