

Corinth Computer Project: Internet Education

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Abstract: Since 1995-1996 the Corinth Computer Project has maintained a web page that has come to serve a variety of purposes. The current site <http://corinth.sas.upenn.edu> has become a form of preliminary publication for the research project, as well as serving as a vehicle through which to share preliminary research results with colleagues and students. In addition to these uses, the web page has become an important teaching tool for Classical Studies and Archaeological GIS courses taught by the senior author at the University of Pennsylvania. Graduate seminars including PC virtual conferences have stimulated the interest of students and faculty alike and student related projects have been incorporated into the design and content of the web page in a number of different ways. A developing focus of the web page design has been the interest in educating the public-at-large, including elementary, junior high, high school as well as college and university students whenever possible. A number of features of the current web page are presented and discussed including the interactive archaeological state plans, virtual movies, virtual 3D fly-throughs and an example of children's educational activities.

Key Words: Elementary education, high school education, university education, GIS, HTML, AutoCAD WHIP, Apple Quicktime, virtual conference, remote sensing, Corinth, Roman cities, city planning

Introduction

Since 1996 the Corinth Computer Project has maintained a web page that has come to serve a variety of purposes. Originally a vehicle for summarizing and publicizing the research and methodology of the research project, the web page now identifies education as a primary component of its design. The Corinth Computer Project as a long-term research project, 1987- present, studying the evolution and planning of the Roman city of Corinth, has grown from a fairly straightforward computerized architectural and topographical survey of the city, looking for the contributions of the Roman surveyors to the city plan, to a broader analysis of the ways in which the Romans planned and developed the urban and rural aspects of the two successive Roman colonies at Corinth.¹

The Corinth Computer Project is a research project of the Mediterranean Section of the University of Pennsylvania Museum of Archaeology and Anthropology, D.G. Romano, Director.² The summer fieldwork, 1988-1997, was carried out under the auspices of the Corinth Excavations of the American School of Classical Studies at Athens, Charles K. Williams, II, Director. The Corinth Excavations, underway since 1896, have successfully uncovered vast portions of the ancient cities of Corinth.

Archaeological, historical and literary evidence about the ancient city has been combined with elements of the current research project in the creation of the current web page to provide a fairly comprehensive introduction to the Roman city and, recently, to the Ottoman city. One of the long-term goals of the research project is to bring together a series of maps of the successive cities of Corinth to create a diachronic study of the evolution and development of the city over three millennia. Although the web page has gradually developed into an important educational tool related to the history and archaeology of the city of Corinth, there have been several evolutionary steps to its design that should be discussed.³ Over the past five years, the web page has grown and expanded to meet not only the needs and goals of the project but also the demands of the interested public.

History of the website

To date, there have been two versions of the web page. The first version, <http://ccat.sas.upenn.edu/~dromano/corinth.html> was created during 1996 and released January 22, 1997, and the second, <http://corinth.sas.upenn.edu> created in 1999 and released March 2000. Both versions of the web page were designed, created and written by the undersigned authors with the assistance of several students, as Research Assistants, of the

Corinth Computer Project.⁴ The whole idea of creating a web page for the project was one that was heavily debated between the authors before work began. The Director was concerned that the time and effort of creating and maintaining a web page would take away from the progress of the ongoing important research of the project, but he was finally convinced of the potential worth of the web page as a form of preliminary publication for the project.

After the decision was made to create the web page, time had to be dedicated to learning the basic processes for web page creation and teaching these skills to others, specifically the programming language of HTML. Creating a web page was a huge undertaking at the time for a low budget research project staffed solely by a handful of humanities-based undergraduate and graduate students typically working 5-10 hours per week. The students had to learn how to convert aspects of the published data and images to web format. This task was very time consuming and, as a result, the progress of the overall research of the project suffered. It was decided in the beginning of the web page project that the finished web page would not be posted on the internet in a piece-meal fashion, but rather that it would appear more or less as a whole in a completed form. The resulting time required to create a complete version of the web page was over one year for each of the two successive web pages. This time included not only the programming time but also the time to receive preliminary feedback about the web page from students, colleagues and interested friends.

Since the Corinth Computer Project did not own a server it was necessary to find a local server to store the data for the web page. This location was found within the School of Arts and Sciences of the University of Pennsylvania; the first generation page was located on the server at the Center for the Computer Analysis of Texts of the School of Arts and Sciences, and the second generation page is currently located on the server for the School of Arts and Sciences. We are grateful to both for their willingness to house the web page. Since its creation both successive web pages have been linked integrally to the web page of our home institution, the University of Pennsylvania Museum of Archaeology and Anthropology, <http://www.upenn.edu/museum>, as well as to many other web pages around the world.

The First Generation Web Page

The first generation web site was fairly simple and static. An attempt was made to combine the use of our technological tools, digital cartography, GIS, Remote sensing and 3D modeling, into the web page. This was accomplished by inserting a fairly large amount of text, combined with multiple static photographs, a 3D fly-through, and screen captures of differing elements of the research. The screen-captures included a low level air photograph, a satellite image and several landscape reconstructions based on our own DTM's and DEM's. The 3D fly through of the 35 km² of the central study area including Akrocorinth had been created in 1993 using AutoDESK 3D Studio with a DTM based on topographical map contours.

The result was moderately successful given the time spent and

the resources available. Reflecting later on the content and format of the first web page, the color selection was poor, and the organization was coherent if not always logical. The audience had been expected to be largely academic, but it turned out to be much more varied. We attempted to design the first version of the web page with the goal of providing an easy to read summary of the project's methods and results. During the beginning of the research and design phase of the first web page, most of our energy was concerned with questions relating to copyright, publication infringement, and permissions as well as coping with the major learning curve of a programming language. It wasn't until the latter stages of our endeavor that we seriously contemplated our audience. Initially, we assumed that the web page would serve university level students and scholars who would have an interest in Corinth or the Classical world. It was not until the end of the first generation web page project that we considered the notion that the public at large might share in our enthusiasm for the research.

The organization of the original site was divided into categories, which were translated into navigation buttons in the following format: Main Page, Corinth Basics, City Plan, Methodologies, Landscape, Acknowledgments, Glossary and Bibliography (fig. 1). From the beginning of the enterprise, the sections of the web page devoted to "Methodologies" have been of great interest to the authors and a category that received full attention at the outset. The "Glossary" was a later addition that was added to help orient the public to a largely scholarly endeavor by adding definitions to words of interest to those who study ancient Roman city-planning. The "Bibliography" section was intended to list the publications that have been produced as a result of the work of the Corinth Computer Project.

During the life of this web page, 1997-1999, over 17,000 unique hits to the web page were registered with our server. We received numerous emails from around the world, highlighting the wide range of visitors to the web page. On the whole, the emails were supportive, constructive and educational for our own curiosity about who was using the web page. This information eventually influenced the creation of the next generation web page. Many of the questions that were received focused on a need for more general and background information, ranging from ancient historical questions to queries about modern methodology.

The Second Generation Web Page

Founded upon the strengths of the first web page, the second web page capitalized upon newer technical innovations of the internet and of web programming.⁵ The second version of the web page included several improvements in content and presentation that enhanced the site in usability, education and overall appeal. An organizational chart was created to logically incorporate new research and technology, a broader discussion on the historical and technical background of our research was added and the authors' made a concerted effort to design the web page in a user-friendly format. This included rearranging the color scheme of the entire web page, making the text black and the background white (so users could print off a page without using excessive printer ink). Navigation through the web page

was a major issue and we attempted to incorporate historical and archaeological relevance into navigation, by the use of an image of a tombstone of a Roman surveyor as the navigation bar icon.⁶ Imagery content was increased, since some comments received about the first web page focused on the poor image resolution of some of the photographs as well as an interest in additional images. A more detailed discussion of the history and methodology of the project and other related scientific techniques were added, broadening the appeal of the site. Other additions included a map that clearly showed the spatial relationship of the successive Greek and Roman cities of Corinth.

A whole section was added to the first generation web page in 1998 and was subsequently improved upon in the second generation web page, being devoted to a later historical period of time, the seventeenth through the early nineteenth centuries AD, during the Ottoman occupation of Corinth (fig. 2). This portion of the web page was conceptualized and written by Ms. Leslie Kaplan, currently a PhD student in Folklore at the University of Pennsylvania, working on a related project for her dissertation. This aspect of the web page brings together literary and historical accounts as well as contemporary maps, plans, photographs and drawings of European Travelers who visited Corinth during this period of time. As such, it complements the work of the Corinth Computer Project that focuses its resources on the development of the Roman city.

Graduate Level Courses

A graduate level seminar, 'City and Landscape of Roman Corinth,' Classical Studies 625, was taught by D. G. Romano at the University of Pennsylvania during the fall semester of 1998. N.L. Stapp assisted in the course.⁷ This was a seminar that focused upon the architecture of the Roman forum, and the relationship of the individual building to the Roman city plan. The students were given specific Corinth forum buildings to research, and some of them drew a ground plan of their building in AutoCAD, either representing its archaeological actual-state or its restored plan. The students were responsible for preparing a seminar paper on their building as well as delivering an oral report to the class on the same subject. A series of guest lecturers spoke about different aspects of the study of the Roman city. One of the guest lecturers for the class, Dr. Guy Sanders, Director of the Corinth Excavations of the American School of Classical Studies at Athens, participated by means of a PC video conference from Athens. This meant that the students in Philadelphia were able to directly interact with the Field Director of the ancient site from Greece and this led to some lively and interesting discussion. This seminar proved to be highly successful, with some of the results being incorporated into the second version of the web page. In each case the student's contribution, whether it was a textual building summary, an actual-state drawing or reconstruction is duly noted and credited.

Interactive Actual-State Archaeological Drawings

The study of the individual buildings of the Roman forum are a part of the consideration of the way in which the Roman city

was put together. For this concept a portion of the web page has been devoted to the 'City Center, ca. 150 A.D.' This image shows the location and organization of the major public, civic and religious buildings from the center of Roman Corinth, ca. A.D. 150 (Fig. 3). The building plan is based on the drawing by C.K. Williams, II from *Hesperia* 56, 1987, fig. 1, and represents the results of fieldwork, study and publication of Williams and the Corinth Excavations over many years. The city plan has been supplemented by the results of the computerized architectural survey of the buildings and monuments of the ancient city by the Corinth Computer Project. This information relates to their location and orientation and the resulting Roman city grid (1 actus wide *insulae*).

For the purpose of the web page, the center of the Roman city is drawn and the religious buildings have been colored magenta, the markets yellow, springs and fountains blue and the places of assembly cyan. Green represents civic and political buildings and structures. Monumental arches are red and the grid of the Roman city is seen as grey. Each of the buildings in the forum area can be clicked on and the link will take the viewer to an individual page that highlights the building, providing drawings, photographs, interactive archaeological drawings and literary references.

This section of the web page was an exciting technological advance for the project. Using new web programming technologies, AutoCAD WHIP, it was possible to include in the web page a vehicle for users to access digitized actual-state drawings of specific buildings of the forum of Corinth (Fig. 4). Each of these drawings is based on the published actual-state drawings in the Corinth Excavations series. For instance, the odeum, illustrated in figure 4 is based on the drawing from Oscar Broneer, *Corinth X, Results of Excavations Conducted by the ASCSA, Cambridge, 1932, plate 11. A significant methodological advance was also incorporated into the second web page; a coding system for every drawn line contained within the individual architectural/archaeological plans of the individual buildings of the Roman forum. This system identifies material, chronology and function, all in one line. This means that the viewer can literally interact with the architectural drawings and look for information related to chronology, material or function of the building in question. Additionally, a brief historical write up of each building with modern and historical photographs and bibliographic references is included. This produces a full educational tool, not only geared towards scholars but to students of all ages.

Virtual Reality Highlights

Another new development of the second generation web page was to include more imagery highlighting the accomplishments of the research of the project (fig. 4). This section was designed to orient the user to the vast array of data on the web page. This section also provides a detailed step-by-step approach to using and viewing the data. These sections include the tutorials and downloadable internet plug-ins for interactive archaeological plans, 3D modeling, and 360-degree panoramic movies.⁸ The internet plug-ins include AutoCAD WHIP and Apple Quicktime. The tutorial section includes demonstrations

of each area of the web page, which requires special technical attention. For example, the panoramic movie area, not only requires a special internet plug-in but the actual use of the application needed to be explained.

Technical Explanations

The authors felt that it was important and necessary to include a detailed discussion of the technology incorporated in the second generation web page. It was recognized that all users do not have the technical ability to navigate or view many of the new innovations in the second web page; therefore, a simple description was provided for the two plug-ins, AutoCAD WHIP as well as Apple Quicktime and links directly to the vendors for the plug-in. In this way users could download the plug-in quickly and continue to use the Corinth web page.

Specialized Sections

During the year 2000, recognizing the interest in Roman gladiators and amphitheaters in general due to the movie 'Gladiator' it was decided to produce a section of the web page highlighting the Roman amphitheater in Corinth. An amphitheater was an important part of the design of any Roman city and this was also true of Corinth. During the summer of 2000 a web page dedicated to the history and function of the amphitheater in Corinth was introduced. The page consists of a physical description of the unexcavated structure and a discussion of its location within the planning of the Roman city. Also included is a brief discussion of the gladiators who would have participated in the festivals held in the facility. Historical photographs of the amphitheater were posted to the web page together with a historical drawing made of the amphitheater in 1830 by a French scholar. Together with this information was added a series of GIS images that simulate 3D views of the remains of the unexcavated amphitheater. Linked to the page is a National Public Radio Real Audio broadcast, of station WHYY, of May 6, 2000, featuring Professor Brent Shaw, Department of Classical Studies, University of Pennsylvania, speaking about Roman Gladiators. There is also a bibliography specifically geared for gladiators in general and the amphitheater at Corinth as well as suggestions for further reading.

The second web page continues to be a success, receiving a higher volume of visitors in a shorter period of time than the first web page (18,000 unique visitors during the first year or approximately three times the rate of the first generation web page). Additionally, we have received reviews from Science Magazine, Archaeology Magazine and the Philadelphia Inquirer and a second place national GIS award from Geospatial Solutions Magazine. The physical size of the web page has expanded, from approximately 12-15 MB for the first web page to a current size of ca. 25-30 MB for the second web page.

Educational Directions

The web page has been used in a number of different ways for educational purposes. As a detailed summary of the research

and methodology of the project, the web page has served as a useful tool to explain the project to a scholarly audience. As a useful tool, the Project included a "links library," which is divided into categories of historical and archaeological interest. In addition to this obvious purpose there have been several other kinds of educational uses for the project. The greatest number of hits to the web page {of which the authors are aware} have come from two sources: elementary/junior high school students and religious scholars. From elementary/junior high students we have received a large number of general inquiries about the research project but also questions about the history of Corinth, ancient Greek customs and daily life in ancient Greece in general. Some of these are specific questions that have to do with the history of Corinth but many of them are more generic questions that have to do with ancient Greece. For instance, "what was the role of women in ancient Greece?" Other questions related to Corinth but were of a more general nature, for instance, "How did the lives of ancient Corinthians differ from those of ancient Athenians?" and "How was Corinthian pottery manufactured?" Other questions were focused on more specific aspects of the city of Corinth. For instance, "How often did Corinthians walk up to Akrocorinth?" Whereas none of these questions are answered by any of the elements of the web page, each of the individual questions was answered by e-mail.

The authors were not expecting the level of interest that was received by the religious community. On both national and international levels, classical scholars, religious scholars and armchair biblical tourists have communicated their interest for more information about Corinth, especially in the time of St. Paul, in the mid-first century A.D. Although the Corinth Computer Project and its web page does not specifically focus on the biblical aspects of Corinth, both the maps and plans of the ancient city as well as the building descriptions and the ancient references included within the web page have been found to be of interest to many religious groups.

The second generation web page has been made reference to by Encarta, Microsoft Corporation's digital encyclopedia, under the entry 'Corinth' which has increased the visibility of the web page.⁹ Additionally, as mentioned above, the scientific and academic merits of the web page were highlighted in Science Magazine.¹⁰ As a whole, the authors intend to offer feedback to all questions received about the web page and the research pertaining to it. Additionally, modifications continue to be made to the site, offering visitors the latest version of our research, making it a tool for the classroom, the scholar or the enthusiast and providing a resource that can be referenced for future research.

The Future of the Corinth Computer Project Web Page

As we plan for the future of the Corinth Computer Project, we continue to imagine innovative ways to develop the web page as a complete educational tool. More of the research data of the project will be made available to the public as time goes on. The public will likely play a greater role in the overall design, offering a combination of academic excellence and public inte-

rest. These plans would include expansion of existing areas, including digital cartography, GIS, 3D modeling, photography and 360-degree movies. Additionally, more educational sections for children will be added, offering exercises designed to make the student think about the Greek or Roman city while being distracted by a task or a game. Examples might include a Corinthian coloring book in which students could download a blank image of a building or monument to be colored in, or a city planning game where students would be able to design their own city using the 'component' elements of a Greek or Roman city. Incidentally both of these suggestions were made by 12-13 year old Philadelphia school children when asked what would they like to see as a future component of the Corinth Computer Project web page. Future additions might also include a complete image library, a textual archive, a larger selection of interactive plug-ins and possibly a member's section, where certified users could have access to restricted data.

Conclusion

The original worry and caution about the time commitment required to create a Corinth Computer Project web page was fully merited. In fact, the time dedicated to the web page has far exceeded even the most pessimistic estimate from 1996, partially due to the fact that the first generation web page was only the beginning of a larger, ongoing and probably never-ending web improvement project. Nevertheless the worth of the project has been demonstrated by several measures.

Probably the most valuable aspect of the web page project from the standpoint of the research is that the web page has provided an attractive and immediate form of preliminary publication. This has served a number of purposes for the scholarly community as well as for the public at-large. Furthermore, the web page has created a vehicle for the distribution of accurate, if summary, information about the Roman city of Corinth. This has proved useful in teaching graduate seminars at the University of Pennsylvania, but also it has been used by elementary, junior high and high school students around the world. Perhaps the most exciting aspect of the web page for the authors has been the ability to be in direct touch with others who find the subject of Roman Corinth both interesting and important.

Endnotes

¹ Earlier publications relating to the methodology and research of the Corinth Computer Project have been published in the following CAA publications: David Gilman Romano and Osama Tolba, "Remote Sensing, GIS and Electronic Surveying: Reconstructing the City Plan and Landscape of Roman Corinth," in *Computer Applications and Quantitative Methods in Archaeology 1994*, Jeremy Huggett and Nick Ryan (eds.), BAR International Series 600, 1995, pp. 163-174. David Gilman Romano and Osama Tolba, "Remote Sensing and GIS in the Study of Roman Centuriation in the Corinthia, Greece," in *Interfacing the Past: Computer Applications and Quantitative Methods in Archaeology 1995*, Hans Kammermans and Kelly Fennema (eds.) Leiden, 1996, pp. 457-463.

² The most recent article that summarizes many of the archaeological and historical results of the project is D.G. Romano, "A Tale of Two Cities: Roman Colonies at Corinth, *Colonia Laus Iulia Corinthensis* and *Colonia Iulia Flavia Augusta Corinthensis*," in 'Romanization and the City, Creation, Transformations and Failures,' Elizabeth Fentress, ed., *Journal of Roman Archaeology*, Supplement 38, Portsmouth, Rhode Island, 2000, pp. 83-104.

³ A forthcoming CAA article will discuss some of the technical aspects of the second generation web page, including the layer conventions and the interactive archaeological plans. D.G. Romano and N.L. Stapp, "Stone for Stone in Roman Corinth," in *Computer Applications and Quantitative Methods in Archaeology*, 1999, Dublin, Ireland.

⁴ The first generation web page was the result of work and design by N.L. Stapp and W. Petrofsky, under the direction of D.G. Romano. The second generation web page was designed by N.L. Stapp under the direction of D.G. Romano

⁵ For the first web page, the Project solely used HTML. The second generation of the web page, the Project used HTML, Java, DHTML, Visual Basic and Macromedia Flash.

⁶ Permission for use of the Roman surveyor tombstone image was received from the Ivrea Museum in Northern Italy.

⁷ N.L. Stapp was responsible for teaching the students AutoCAD and assisting in other technical issues relating to the student projects.

⁸ There is one Quicktime movie included in the second generation web page that illustrates a 360 degree photographic panorama of the Roman forum as it exists today.

⁹ <http://encarta.msn.com/find/Concise.asp?z=1&pg=2&ti=761574743>

¹⁰ <http://corinth.sas.upenn.edu/awards.html#science>

Figures

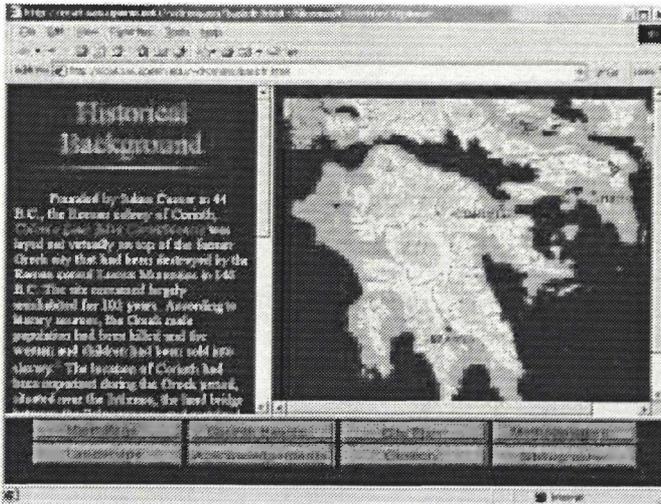


Figure 1: Example from the first generation web page, ca. 1996.

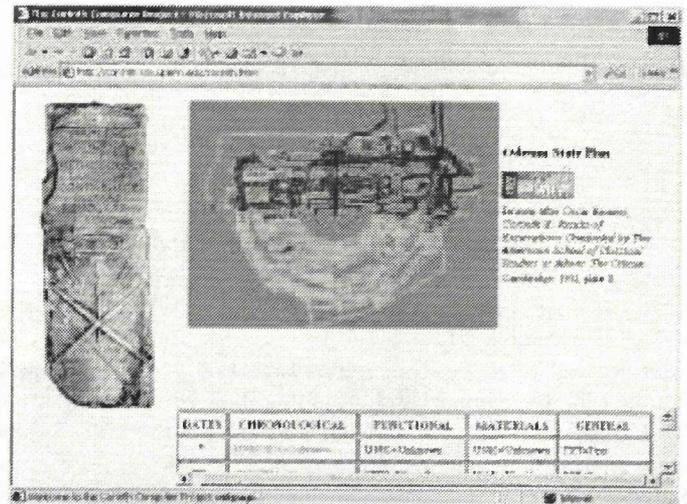


Figure 4: Example of the "Interactive State Plan" section of the web page.

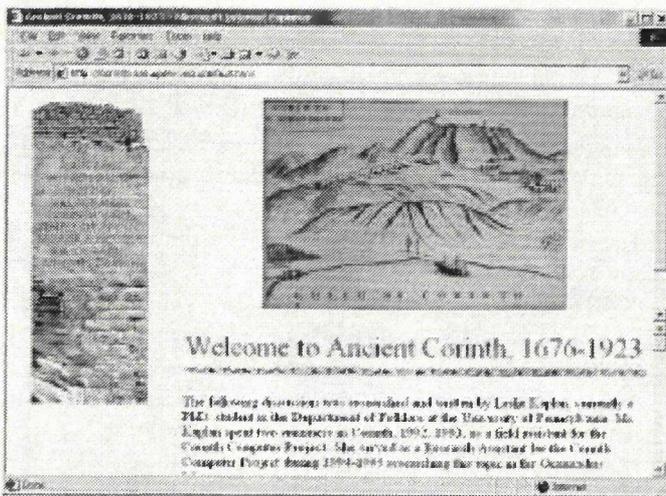


Figure 2: Introduction to Leslie Kaplan's 17th – 19th century Corinth web page.

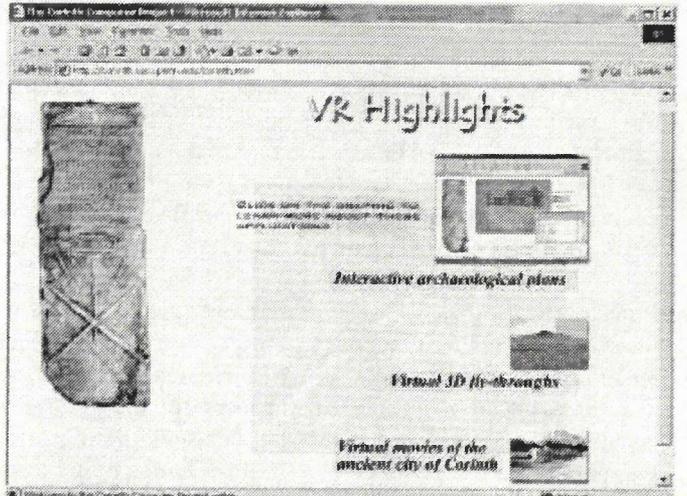


Figure 5: Example of the Virtual Highlights section of the second web page.

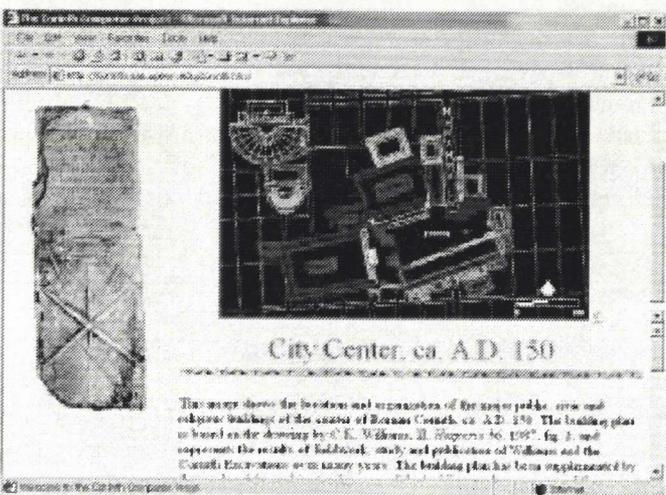


Figure 3: Clickable City Center, ca. AD 150.

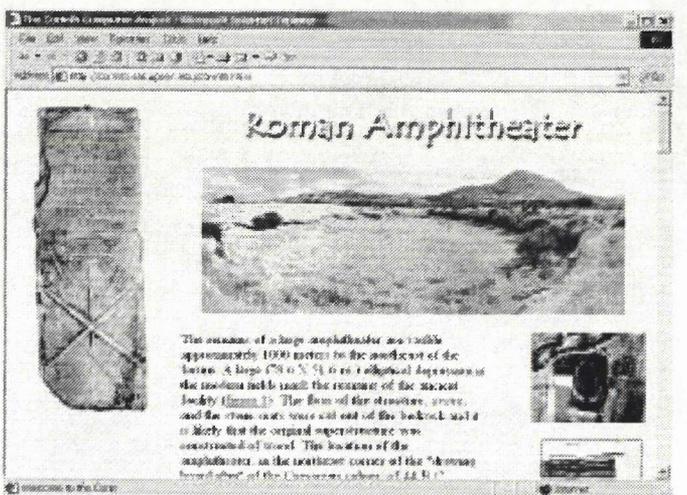


Figure 6: Detail of the section on the Roman amphitheater in Corinth.