

The Art of Medicine
Revolutions in Vision

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The 16th Century marked the beginning of a completely new way of seeing the human body. Remarkable advances in Art blended with extraordinary breakthroughs in Medicine and produced a Renaissance of medical thought. Anatomy and Physiology became the focus of medical research, opening the door for many new accurate and insightful theories regarding the structures and functions of the human body. Never before had the world witnessed such an explosion of information. The art within science had been discovered, and the field of Medicine would never be the same.

Today, we are experiencing another Renaissance. New developments in Art, especially in the areas of Computer Imaging and 3D Visualization, are aiding physicians in the diagnosis and treatment of their patients. Once again, the line between Medicine and Art is blurred, each one aiding the other in expression and practice. The result is an era of technological progress with great similarities to that seen in 16th Century European society.

This project utilizes the powerful capabilities of the multimedia cd-rom to explore these fascinating periods in the history of medicine. The cd-rom offers interactivity that transcends the two-dimensional, static properties of books. Instead, the user is given a hands-on experience that teaches as well as entertains, providing an extremely effective method of education.

Introduction

Medical imaging is in no way a new area. We often think that this field was established with such developments as x-ray imaging and CT scans, and while these two examples did certainly progress medical imaging, they, in no way, created it. From their beginning, humans have possessed a desire to express themselves through art. A quick glimpse of an art history book will prove this idea. From crude sculpture and cave paintings to elaborate architecture and three-dimensional renderings on computers, the need for self-expression has been realized in the production of works of art.

As technology progressed in society, people discovered ways to utilize it in the creation of art. In the Bronze Age, many of the pieces of sculpture were created with this new material. In the European Renaissance, the developments in geometry served as the basis for paintings and sculpture. In the Information Age, the computer is a frequently used tool in the creation of art. Thus, artists often adopt the developments of their society to produce works of art that reflect that society.

The symbiotic nature of art and technology is evidenced in the evolution of medical imaging. Early cave paintings reveal some of the first attempts at healthcare and stone sculptures represent persons with health-related characteristics, such as pregnancy. These images probably served a narrative purpose, and, in their storytelling, they certainly educated humans in the existence and treatment of themselves.

From these prehistoric beginnings, the goal of medical imaging was basically to tell stories about the human body. These stories could then be applied to the study and treatment of other people. The ancient Greeks created countless volumes of stories and images that were to aid physicians in caring for their patients. Whenever a physician encountered an unexpected illness, he would refer to these volumes, reading about past experiences in order to deal with the present one. In current medicine, the situation is the same. Physicians go to sources of past experience to find the specific illness or method of treatment. These sources usually contain such images as x-rays, CT scans, photographs, and even hand-drawn illustrations.

Arguably, the two most fascinating periods in the history medical imaging are seen in the developments of the European Renaissance, and those of today, the Information Renaissance. In these two periods, great achievements in the way we view ourselves contributed enormously to the study of medicine. For example, Andreas Vesalius' meticulous dissections and renderings of the human form provided an invaluable reference for physicians during the Renaissance in Europe. These images literally traced the entire structure of the human body, dispelling several myths regarding human anatomy. Today, projects such as the Visible Human Project provide detailed maps of the human body. The Visible Human is a digitized man whose images are stored on the Internet so people can easily access this anatomical information. The images are comprised of CT scans, MRI scans, and photographs. Uses of this information ranges from simple viewing to three-dimensional reconstruction for viewing from any angle.

To effectively present the highlights of these two periods of history, I chose to incorporate the exciting technology of multimedia design for the computer. The power and capabilities of consumer-level computers have increased dramatically in the last twenty years. The average home computer can now accomplish tasks that the early supercomputers could never accomplish. The great strides made in 3D graphics, video, audio, and animation allow a user to experience vast, interactive worlds on a desktop computer. Therefore, a presentation of the use of technology and art in medical imaging easily lends itself to multimedia design. To create this cd-rom application, I used Macromedia Director 5.0 as the main development environment. Other programs used were: Adobe Photoshop 4.0 for image processing and manipulation, Caligari TrueSpace 2 for 3D graphics and animation creation, Adobe Premiere 4.2 for video editing, and Mixman Studio for music composition and sound editing and recording.

I wanted to create a program that would interactively explore medical imaging during the European Renaissance and the present. When researching these periods, I found that they were very similar in their patterns of development, even to the point of exhibiting parallel methods. For example, Leonardo da Vinci would often use executed criminals for his dissections and illustrations. The Visible Human Project, a modern equivalent to da Vinci's studies, also used an executed criminal for the imaging. With such comparisons, I realized that I needed to emphasize the similarities between the two periods, so I found aspects of medical imaging from one period that corresponded to the other period, differing only in the technology available. The result is a program that allows the user to explore various areas of medical imaging, participating in games and other interactive experiences that heighten the involvement of the user and prove more conducive to learning. The program presents examples of some of the great discoveries in our quest to visualize the human body, and illustrates the fact that human vision is only limited by the tools used to materialize it.

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