

Research Article: history of anatomy and embryology

Anatomy and art

Konstantinos Laios*, Gregory Tsoukalas, Marianna Karamanou, George Androutsos

History of Medicine Department, Medical School, University of Athens, Greece

Submitted January 4, 2013; accepted revised March 15, 2013

Summary

Leonardo da Vinci, Jean Falcon, Andreas Vesalius, Henry Gray, Henry Vandyke Carter and Frank Netter created some of the best atlases of anatomy. Their works constitute not only scientific medical projects but also masterpieces of art.

Key words

Anatomy, atlas, painting, Leonardo da Vinci.

Introduction

An atlas of anatomy is a necessary tool for a medical student in order to study the demanding lessons of anatomy. Even if nowadays 3D images can be used for this purpose, they are simply the development of the color or black and white atlases of anatomy used until today. Nevertheless, the construction of such an atlas needs not only exact medical knowledge of anatomy but also artistic ability, in order to become both a work of art and a scientific enchiridion.

Origins and history

Although atlases of anatomy are known from Renaissance, their roots may be found in ancient Greece. Despite the primitive character of ancient Greek medicine, Alcmaeon of Croton is considered the 'Father of Anatomy' in grace of his pioneer anatomical work (Longrigg, 1993). The progressive study of anatomy is seen in the works of the Hippocratic and Aristotelian Corpus (Nutton, 2004) and also in those of the other famous ancient Greek physicians such as Herophilus (Von Staden, 1989) and Soranos of Ephesus (Drabkin, 1951). We may assume that there were anatomical atlases in ancient Greece notwithstanding the fact that we have not found any. The magnificent development of art and design in these days gave the opportunity for special medical drawings, in order to overcome the difficulties in studying anatomy in dead bodies due to religious and philosophical beliefs (Pedley, 2002). In addition their existence in antiquity can be educed not only by the accuracy in human figure anatomy in various forms of ancient art but also by the creation of figures with the

* Corresponding author. E-mail: konstlaios@gmail.com.

characteristics of various diseases. Those facts mean that surely anatomical designs of physiological and pathological forms were known to the artists. Furthermore we should not forget that there are a lot of roman ex-votos, which depict internal organs, letting us to infer the necessary existence of anatomical atlases (Grmek and Gourevitch, 1998).

Although illustrated medical atlases existed in Islamic medicine as the famous *Cerrahiyyetu'l-Haniyye* (Imperial Medicine) by **Şerafeddin Sabuncuoğlu** (1385-1468) anatomical illustrations were difficult to be drawn because religion did not allow human dissection (Sungur, 2009). There are various medical illustrated images in Byzantine medical texts, but also these doctors did not enrich works with anatomical designs because of respect for the dead body (Pioreschi, 2001).

Renaissance is the turning point in this attitude. Leonardo da Vinci (1452-1519), even if he was not a physician, was interested in understanding the anatomy of the human body, so he executed many dissections, studied anatomy as if there had not been any previous other anatomical study, and offered series of anatomical images which constitute the first systematic scientific anatomical work. Being a master painter created masterpieces in anatomical drawing such as the "The Man of Vitruvius" (Kenneth, 1964). Jean Falcon (1491-1541), a great surgeon and anatomist, wrote his greatest work the "Guidon" which had become the main study tool for surgeons, a real handbook of all required knowledge enriched with Falcon's vivid illustrations (Tsoucalas et al., 2012).

Renaissance was the epoch in which the "Father of Modern Anatomy", Andreas Vesalius (1514-1564), acted. Being a physician and professor in the medical school of Padua, he deeply understood the necessity of anatomy. His thorough anatomical studies revised the dogmas of anatomy formulated in ancient times mainly by Galen, pointing out that Galenic anatomy concerned mainly animals which were Galen's main pieces of study. Vesalius' innovative anatomical work was crystallized in his series "De humani corporis fabrica, libri septem" and "Epitome". His work was illustrated by the famous painter Stephan van Calcar (1499-1546). Vesalius' legacy had a great impact not only on the physicians of the following decades, but also on those of the following centuries. Every doctor who wrote a book about anatomy showed great respect for Vesalius' anatomical theories and teaching method by using accurate and artistic designs to accompany the text (O'Malley, 1964).

The publication of William Hunter's (1718-1783) great anatomical atlas "The Gravid Uterus" in 1774, created immediate and widespread interest in the medical circles of London and the whole western world. For the sake of elegance and clarity William Hunter and his friend Jan Van Rymdyk, a gifted painter, spared no expenses to create their outstanding work (Corner, 1951; Tsoucalas et al., 2011).

"Gray's Anatomy", published in 1858 in London, has been a decisive station in the history of artistic anatomy. The explicit collaboration of two physicians, Henry Gray (1827-1861) and Henry Vandyke Carter (1831-1897), gave medical studies an anatomical writing that is still, in its modern editions, a standard book for every medical student worldwide. Gray offered his detailed knowledge of anatomy, since he was a distinguished descriptive and surgical anatomist. Being 25 years old he was elected Fellow of the Royal Society. Carter, who was a professor of anatomy in Grant Medical College in Bombay from 1858 to 1888, was an anatomist and a painter whose anatomical illustrations in this book were the artistic counterpart of the scientific context (Standing, 2011).

In the 20th century probably the most distinguished anatomy painter was Frank Netter (1906-1991). Art was his passion, therefore he studied it. Being pressured by his family he had also studied medicine and completed a surgery internship. He started a medical career but soon enough he turned towards medical illustration for supporting his income. The scientific accuracy of his medical designs combined with his artistic perfection awarded Netter a leader role in medical illustration. He has then been entirely devoted to this production, creating medical atlases not only for anatomy but also for all fields of medicine, which constitute an indispensable supplement in modern medical study (Editorial, 1981).

Conclusion

In conclusion, art serves as an auxiliary tool in order to facilitate medical study and especially that of anatomy. Many efforts have been devoted to this purpose even in ancient times, even if we can not find clear evidences for that. From Renaissance until modern times there has been progress in medical design following the progress of medical science. Despite the technological advances in medical education, medicine is strongly connected with medical artistic illustrations, which constitute an initiating step towards medical science.

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