

Henry Vandyke Carter (1831-1897): the forgotten co-author of *Gray's Anatomy*

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Abstract

Henry Vandyke Carter (1831–1897), physician and illustrator from Saint George's Hospital in London, England. He worked with Henry Williamson Gray (1827–1861) on anatomical dissections and Carter's illustrations contributed significantly to the success of the *Treaty of Anatomy, Descriptive and Surgical*. Henry Carter never achieved any credit or royalty for his work. This book is currently regarded as one of the most influential human anatomy textbooks. The paper aims to present a brief review of Henry Carter's contributions to the medical field.

Keywords: anatomy; England; Henry Vandyke Carter; *Gray's Anatomy*; medical education; professor

Introduction

Human anatomy has historically been the starting point in medical education. Knowledge of human anatomy is the keystone in the vast and complex field of medicine. Among the significant contributions to learning and teaching of human anatomy in English are those made by Henry Williamson Gray and Henry Vandyke Carter. They worked on their outstanding *Anatomy, Descriptive and Surgical*, a book considered a landmark in the field of human anatomy. This textbook has influenced and instructed many medical students all over the world. The purpose of this paper is to do a systematic review to present a brief revision of Henry Vandyke Carter's contributions to the fields of human anatomy, Leprosy and tropical medicine.

Methods

In order to investigate Henry Vandyke Carter (1831–1897) and his anatomical works, during February 2022 and August 2023, a systematic review was carried out by consulting PubMed, Scopus, Scielo, Cochrane and Medline databases to conduct comprehensive research and literature review using the MeSH (Medical Subject Headings). Fourteen articles were obtained related to the objective of this research, a brief review of Henry Vandyke Carter's contributions to the fields of human anatomy and tropical medicine.

Medical training

Henry Vandyke Carter was born into a family of limited financial means on May 22, 1831, in Hull, England. Therefore, traditional access to university studies was not an option for him at the time. He decided to train as an apothecary in London, which was a common pathway to continue into medical studies [1, 2].

He attended St George's Hospital medical school in 1848. He is qualified to work as a general practitioner by gaining membership in the Royal College of Surgeons of England. Carter obtained an apothecary's license in 1852. Immediately afterward, he earned a studentship in human and comparative anatomy at the Hunterian Museum of the Royal College of Surgeons from 1853 to 1855. Richard Owen (1804–1892), a comparative anatomist and John Thomas Quekett (1815–1861), a microscopist, were his work companions at the time. Carter cataloged and mounted specimens and performed various dissections. He also prepared materials for lectures and examinations.

At the same time, Henry Carter furthered his formal studies and received degrees as a Medical Bachelor (1854) and as a Medical Doctor (1856) from the University College Hospital and the University of London, respectively [3].

Teamwork with Henry Williamson Gray

In 1853, after obtaining a membership in human and comparative anatomy at the Royal College of Surgeons, he became a demonstrator at Saint George's Hospital in London. There, he met Henry Williamson Gray (1827–1861), an outstanding anatomist and curator of the museum at the mentioned hospital.

Alongside Henry Williamson Gray, Carter illustrated the publication titled *The Structure and Use of the Human Spleen* [4]. Gray continued to do exceptional anatomical research and published his most outstanding work *Anatomy, Descriptive and Surgical* in 1858. Two thousand copies were printed. It was a 750-page book that contained 363 of Carter's illustrations. The arrangement of the information and the close relation between the text and the illustrations displayed Gray's clear understanding of human anatomy [5, 6].

At Saint George's Hospital, Henry Williamson Gray and Henry Vandyke Carter worked together during 1855–1857 on anatomical dissections to achieve as accurate a representation as possible with the layout of Gray's writing.

In 1861 Henry Gray died while preparing the second edition of his book. He had recruited the collaboration of Timothy Holmes, a

colleague surgeon [3, 7]. Being committed to the task that Gray had bestowed upon him, Holmes masterfully prepared the subsequent seven editions of the masterpiece in anatomy. The excellence of Carter's illustrations contributed significantly to the success of the book—*Anatomy, Descriptive and Surgical*. This textbook was written for medical students, physicians, and especially surgeons and quickly became their obligated reference. It continues to be so [4, 8].

The drawings in Gray's Anatomy

Besides working on anatomical dissections, Henry Vandyke Carter drew the illustrations in 1856–1857 for the textbook on human anatomy written by Henry Williamson Gray. Carter's great innovation was to place the names of the anatomical structures directly on the images themselves, something that medical students found very helpful [2, 3, 7, 9]. Prior anatomy books lacked masterful drawings in which he cleverly used the shading technique. The quality of his representations were distinctive and remarkably valued (Figure 1) [2, 3, 8–10].

Credit for Carter's work in the first edition was minimized at Gray's request. Henry Carter's name was reduced and his medical titles were removed. Carter's work as illustrator and anatomist was recognized lone by editor Henry Lea in second American edition of *Anatomy, Descriptive and Surgical*, published in Philadelphia, United States in 1866 [9, 10]. Regrettably, he never received any royalties for his painstaking work or credit.

Duty in India

Henry Carter finished his handiwork on *Gray's Anatomy* in 1858, afterwards, he left England and traveled to India. He became an Assistant Surgeon at the Bombay Medical Service. He entered the Grant Medical College of Bombay, where he taught anatomy and physiology. Carter identified the mycetoma in 1860 as a mycotic disease.

From 1863 to 1872, he performed duties as a Civil Surgeon in Satara. His curiosity about the study of leprosy led him to travel to several European countries and Asia Minor between 1873–1874 [3, 10]. He returned to India in 1875 and was assigned to Kathiawar (currently Gujarat), where he further studied Leprosy. Affiliated to the Grant Medical College, Carter was the first Medical doctor at the Jamsetjee Jhejeebhoy Hospital in 1877. He also presided over the Medical and Physical Society and was Dean of the Medical Faculty of the University of Bombay. In the 1870s, undernourished Indians were suffering from a severe feverish illness. Carter identified a spirochete, *Spirillum minus* as the cause of the illness. The disease was relapsing fever. His findings were published under the title of *Spirillum Fever: Synonyms: Famine or Relapsing Fever as Seen in Western India* (1882) [7, 10, 11].

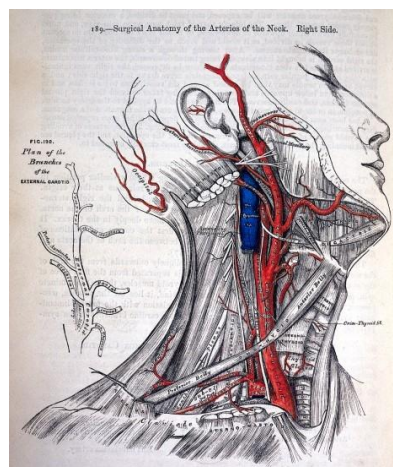


Figure 1 Surgical, anatomy of the neck, *Gray's Anatomy* 1858

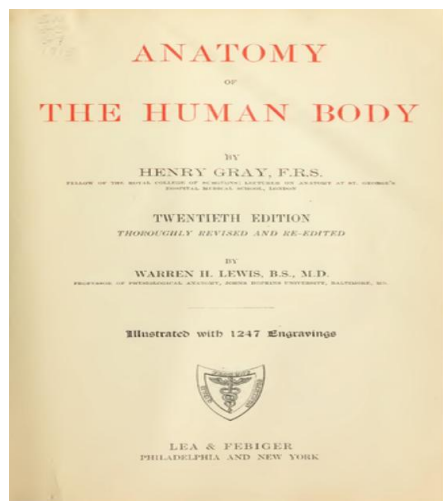


Figure 2 Gray's Anatomy, 20th edition 1918

But Henry Carter wrote additional papers in the field of tropical pathology among them are: *On Mycetoma or the Fungus Disease of India* (1874); *On Leprosy and Elephantiasis* (1874), and *Modern Indian Leprosy* (1876) [12–14]. In a different field, he published *The Microscopic Structure and Mode of Formation of Urinary Calculi* (1873).

In 1882, Henry Carter received in London the Stewart Prize of the British Medical Association, which rightly paid tribute to his work in the medical field. Six years later, Carter retired from the Indian Medical Service and returned to England. He contributed with 10,000 rupees, a considerable sum at the time, for the creation of a lectureship in Physiology in 1888. Queen Victoria conferred Henry Carter the appointment of Honorary Deputy Surgeon-General and Honorary Surgeon to the Queen in 1890. Henry Vandyke Carter died of tuberculosis at Scarborough, England, on 4 May 1897 [12, 13].

Discussion

First published in 1858, *Gray's Anatomy* (Figure 2) has been continuously revised and reprinted ever since by several teams of anatomists. It still is one of the most influential books on human Anatomy.

In spite of their collaboration, when Henry Gray received the proofs of the first edition, he sent them back, stipulating that the font size for Carter's name be reduced, and his medical titles removed, claiming that his illustrations were barely noteworthy. In most modern editions of the textbook, Carter's name doesn't even appear. Deplorably, Henry Carter has yet to receive any credit or royalty for his painstaking work. Nevertheless, Carter's 363 original and wonderful drawings have appeared in every ensuing edition, up to the present edition one, the 42nd. Moreover, Henry Vandyke Carter had a successful career searching for leprosy and several tropical diseases in India for 30 years.

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