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Henri de Mondeville (1260-1320): Medieval French Anatomist and Surgeon

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SUMMARY

Henri de Mondeville (1260-1320) was a French anatomist and surgeon. He was surgeon to King Philip the Fair of France and his successor Louis X. He belonged to an elite class of surgeons, the *médecins-chirugiens*, who were graduates of a medical school as well as holders of a Master's Degree, and were held in high esteem in the practice of surgery. He served as Professor of Anatomy and Surgery at the University of Montpellier between 1301 and 1304. He was a visionary anatomist, who taught the subject from a series of handmade, full-length illustrations, which, though rudimentary in terms of precise anatomical knowledge, marked a significant transformation in anatomical studies during those days, as human cadaveric dissection was prohibited and anatomists had to rely solely on textual descriptions prevalent from the ancient period. Mondeville conducted the first unauthorized human dissection at the University of Montpellier in 1315, and his efforts were pivotal towards legalization of human dissection in France from 1340. He was the first Frenchman to author a surgical text, *La Chirurgie*, which he could not complete due to his untimely death. Mondeville introduced the concept of aseptic management of wounds without inducing pus formation, and successfully applied the same on injured soldiers. However neither his contemporaries nor his immediate successors recognized the value of his work, which gradually went into oblivion, only to be rediscovered centuries later with the revival of antiseptic surgery in modern times.

Key words: Anatomical illustration – Human dissection – Montpellier – La Chirurgie – Aseptic wound dressing – Arterial ligation

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INTRODUCTION

Henri de Mondeville was born in Normandy, France, in 1260. Although the actual place of his birth is not beyond doubt, the repeated use of Norman forms for French words in his communications established his origin (Clarke, 1931). The correct form of his surname is also undetermined. According to ancient Norman custom, his last name is derived from the place of birth, and is variously spelled as Amondeville, Esmondeville, Mandeville and so on (Vidal, 1985). His younger contemporary, Guy de Chauliac (1300-1368), referred to him as Hermondaville, however the predominant form used in literature is Mondeville (Clarke, 1931). Very little is known about the details of his early life. Mondeville probably took his degrees as Clerk and Master in medicine from the University of Montpellier (Pilcher, 1895). It may be mentioned here that medieval European universities, particularly Montpellier, Paris and Bologna were the soundboard of Islamic Golden Age author Avicenna's compiled medical work *Canon,* which was translated by Gerard of Cremona in the city of Toledo between 1150 and 1187 (Arráez-Aybar et al., 2015). Later on Mondeville came to Paris and took lessons in Surgery from Jean Pitard (1228-1315), who was the royal surgeon to Louis IX, Philip the Bold and Philip the Fair of France (Bullough, 1959). As a cleric-physician, Mondeville went to the University of Bologna, which had emerged as

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the most popular institution in Europe for learning medicine, thus attracting students from the whole of Italy and many other countries (Pilcher, 1906; Vrebos, 2011). His natural bent and enthusiasm for surgery was quite clear, as in Bologna he became a disciple of Theodoric Borgogni (1205-1296), who was one of the most prominent surgeons of the Medieval Period and dominated the medical school of the University of Bologna (Clarke, 1931). Borgogni is credited for promoting significant advances in medieval medicine, including basic antiseptic practice in surgery and the use of anesthetics (Prioreschi, 2001). He taught new practices in the treatment of wounds that were opposite to the prevalent tradition of those days (Martin, 2008). Mondeville was remarkably influenced by Borgogni, as he appreciated and used his methods of dressing wounds (Vrebos, 2011). Regardless of the low esteem in which surgery was held in those days, Mondeville studied it with passion and completed his training in surgery in Bologna (Pilcher, 1895). On his return to France, Mondeville gained in stature as an independent, enthusiastic, pragmatic and belligerent character, who endeavored to elevate the position of surgery in 13th century France (Icard, 2010). He earned his reputation as a skilled practitioner, a teacher of anatomy, and a writer whose scientific communications were verbose yet lucid, exercising a caustic wit in a most virulent manner, disagreeing with his contemporaries and mentalities of his time (Clarke, 1931). Remaining a bachelor, Mondeville devoted his life to the practice and art of his profession (Bonnichon, 2005).

PROFESSIONAL CAREER AS ROYAL SURGEON

The first available official document referring to Mondeville dates back to 1301, where he appears as surgeon to King Philip the Fair of France, probably appointed on recommendation from his teacher, Jean Pitard. The document also states that Mondeville had accompanied the royal family to Flanders in Belgium, on a journey lasting from spring to autumn (Pilcher, 1895). Mondeville belonged to an elite class of surgeons, the *médecins-chirugiens,* who were graduates from a medical school and holders of a Master's Degree. The *médecins-chirugiens* were a class apart from the lay surgeons (artisans who were usually unskilled and untrained) and the barber surgeons, who were an integral part of the practice of surgery in those days (Vrebos, 2011). He shared the duties of medical advisor to the king with two other surgeons, as well as three physicians and as a result his engagement as a royal surgeon was not uninterrupted, thus Mondeville was able to follow his academic pursuits whenever he was free from his duties (Martin, 2008). However, his services were called for whenever it was necessary, and on several occasions he had to accompany the army, either with the King or the Count of Valois (feudal fief of the Kingdom of France), and consequently he applied Theodoric's method of wound management with considerable success (Zimmerman and Veith, 1993). Mondeville valued his academic exploits more than his royal duties, as in 1312 he documented his dissatisfaction when he was being sent scurrying about the country on royal missions (once he even had to accompany the king to Arras which was probably an English possession in Europe), thereby not being able to take his classes and losing valuable time for writing his surgical treatise, *La Chirurgie* (Clarke, 1931). Incidentally, he had completed the first two parts of his surgical text by 1312. His unrest was clearly evident as he even remarked regarding nonpayment of his remuneration towards his services to the king (Cohen, 1995). Nevertheless he continued to serve as royal surgeon, and after the death of Philip the Fair in 1314 he was retained in the same capacity by his successor, Louis X. He was eventually spared of his engagements for the last three years of his life, following the death of Louis X in 1316 (Glick et al., 2014). However, by this time he became apprehensive about his own health, as he suffered from asthma and pulmonary tuberculosis. His condition gradually deteriorated and eventually he succumbed to his illness and died in 1320 (Vrebos, 2011).

A VISIONARY ANATOMIST

Available literature suggests that Mondeville conducted classes as Professor of Anatomy and Surgery at the University of Montpellier from 1301 to

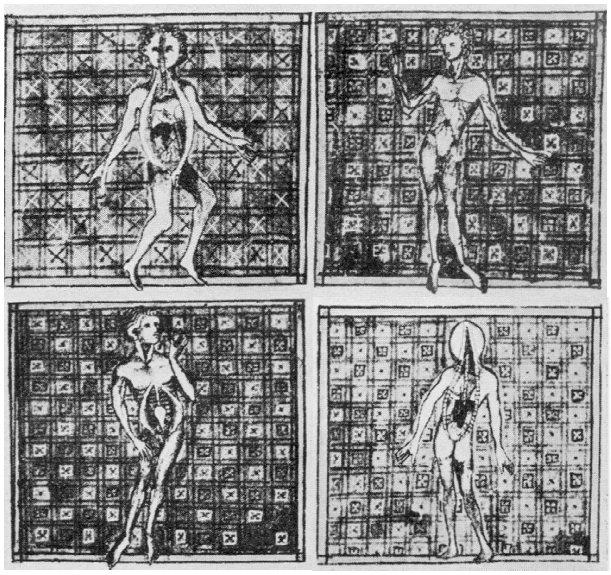


Fig. 1. Handmade illustrations used by Henri de Mondeville while teaching anatomy at the University of Montpellier. Though lacking in terms of anatomical knowledge, these illustrations are significant landmarks of the developments in the field of anatomy during the Medieval Period.

1304 (at least), whenever he could relieve himself from his services to the King (Macdougall, 2000). He taught anatomy at Montpellier from a series of full-length anatomical illustrations, at first twelve in number, which he afterwards increased to nineteen (Pilcher, 1895). However, Guy de Chauliac refers to them as thirteen in number which could be related to their utility in relation to human dissection (Chauliac, 1997). These illustrations were later included in their miniature forms in Mondeville's surgical text. The drawings show the human cadaver usually in a swaying or relaxed standing position (Fig. 1). In the illustration of the skeletal system, the human body is depicted as being covered with dried soft parts, and in the sketch of the muscular system the skin is carried by the cadaver on a stick over the shoulder (Fig. 2). In other anatomical figures, the blood vessels and the heart are drawn on the surface of the body, or the body is dissected from the back with projection of the viscera (Nicaise, 1893). Similar to the illustrations prepared by other anatomists from the medieval period, the handmade anatomical drawings of Mondeville were mostly unrealistic and rudimentary, a fact which could be attributed to the lack of precise anatomical knowledge, since human dissection was not practiced in those days (Gurunluoglu et al., 2013). Nevertheless, the anatomical illustrations prepared by Mondeville presented viewers with simple outlines with definite contrast, devoid of shadowing and shading kept to a minimum (Prioreschi, 2003). These figures may appear as lacking in useful anatomical information in the present day. However, the principles behind their preparation represent the utility these images served. These images were used to teach anatomy to medical students at a time when human dissection was considered blasphemous, and the progress of anatomy was hindered by the blind faith on the works of ancient anatomists like Galen, which were invariably based on animal dissection (Singer, 1957; Gregory and Cole, 2002). The anatomical drawings used by Mondeville represent a significant transformation in the depiction of anatomy, whereby medieval anatomists tried to teach their students through illustrations rather than text alone (Sarton, 1927-1948). These handmade anatomical figures from the medieval period paved the way for the emergence of more artistic representations in the form of wood cut illustrations at the onset of Renaissance in Europe (Ghosh, 2015). Mondeville moved to Paris in 1306, possibly called for his royal duties. However he did not stay away from academic activities very long, and by 1308 he took lectures in anatomy and

Fig. 2 (above). A sketch of the muscular system, prepared by Henri de Mondeville and included as a miniature in the first part of his surgical treatise, *La Chirurgie.* The drawing shows the cadaver carrying its own skin on a stick over the shoulder.

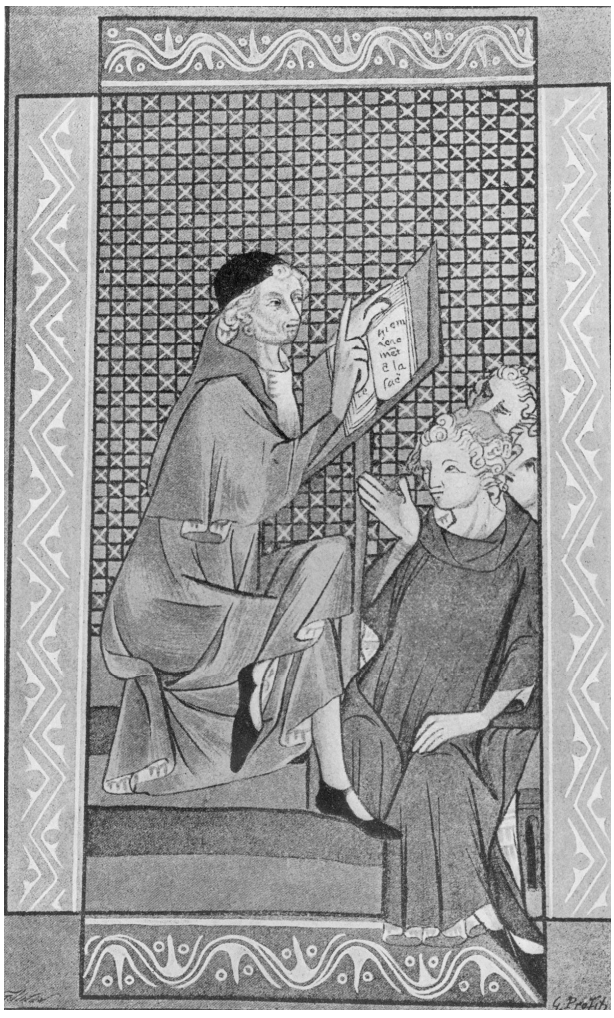
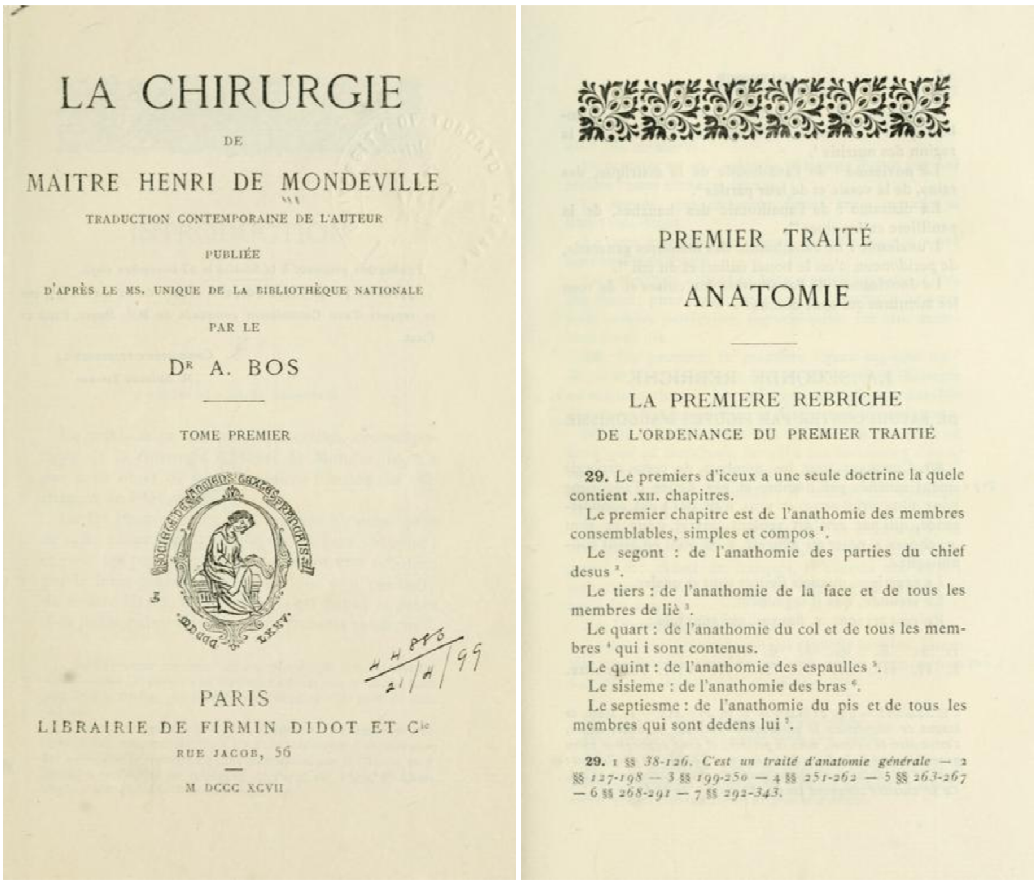


Fig. 3 (right). Portrait of Henri de Mondeville lecturing to his students from his surgical treatise, *La Chirurgie*. The figure was included in a manuscript of 1314, which was a contemporary French translation of the first two parts of his surgical text.

surgery at the medical schools in Paris, and during this time he referred himself as *'Scholaris Parisius'* (Vrebos, 2011). Mondeville always kept himself informed about the ongoing developments in Montpellier on the academic front, a fact that is evident from his friendly communications with Bernard de Gordon (1270-1330) who was the professor of medicine in Montpellier at that time (Pilcher, 1895). In 1312, he read the first two parts of his surgical text (which included his lessons in anatomy and his expertise regarding management of wounds respectively) publicly in medical schools, before students and other distinguished persons from the society, without any remuneration (Fig. 3). Although he used Latin in his manuscript, which at that time was the language of scientific writings, he presented his lectures in French, possibly because not everyone in the audience was familiar with Latin (Clarke, 1931). Mondeville considered that all the white tissues had the same character and subsequently classified nerves, tendons, aponeurosis and ligaments together (Prioreschi, 2003). In this respect, he was probably influenced by the opinion of Galen, as it was his textbook that dominated the field of anatomy in those days (Marx, 2013). Moreover, the translation of the *Canon* of Avicenna, who had developed and systematized Galen's ideas, could have had an effect on his work (Arráez-Aybar et al., 2015). Mondeville classified muscle tissue as '*musculus*' which referred to all those muscles which were long, thick in middle and smaller at extremities thus resembling a 'mus' or rat and '*lacerti*' which included all the other muscles. He mentioned a cavity in the inter-ventricular wall of the heart and opined that it was the source of '*spiritus*', which carried life. He further emphasized that the '*spiritus*' passed on to the left ventricle and thereby distributed by the arterial blood throughout the body. The term '*spiritus'* changed its name in various organs, being the '*soul*' in the brain, '*nutritive spirit*' in the liver and so on. Mondeville was unable to understand the function of lungs, which could be attributed to the fact that the circulation of blood was not yet discovered, and he thought that their role was to refresh the heart. He considered the uvula as a very important organ, which prepared and modified the air prior to its entrance into the chest (Nicaise, 1893). Mondeville had conducted dissection during his stay in Bologna, a practice that he carried to Montpellier with him (Arráez-Aybar, 2010). He realized the significance of human dissection towards advancement of anatomical knowledge, and thus conducted the first unauthorized human dissection at the University of Montpellier in 1315 (Pettenati-Soubayroux et al., 2012). It was in the same year


LA CHIRURGIE

DE

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PREMIER TRAITÉ

ANATOMIE

LA PREMIERE REBRICHE

DE L'ORDENANCE DU PREMIER TRAITIE

29. Le premiers d'iceux a une seule doctrine la quele contient .xii. chapitres.

Le premier chapitre est de l'anathomie des membres conemblables, simples et compos [1].

Le segont : de l'anathomie des parties du chief desus [2].

Le tiers : de l'anathomie de la face et de tous les membres de liè [3].

Le quart : de l'anathomie du col et de tous les membres [4] qui i sont contenus.

Le quint : de l'anathomie des espaulles [5].

Le sisieme : de l'anathomie des bras [6].

Le septiesme : de l'anathomie du pis et de tous les membres qui sont dedens lui [7].

29. 1 §§ *38-126. C'est un traité d'anatomie générale* — 2 §§ *127-198* — 3 §§ *199-250* — 4 §§ *251-262* — 5 §§ *263-267* — 6 §§ *268-291* — 7 §§ *292-343.*

Fig. 4. Images showing the cover page and the first page of the section on anatomy from an edition of *La Chirurgie* de Maitre Henri de Mondeville, which was edited by Dr. A Bos and published in 1897 by Librairie De Firmin Didot et cie, Paris.

that Mondino de Liuzzi conducted the first officially sanctioned systemic human dissection in Bologna, after a hiatus of 1700 years, when Herophilus and Erasistratus had conducted the same in ancient Greece (Rengachary et al., 2009). It may be mentioned here that the first authorized dissection in France was conducted at Montpellier in 1340 (McArdle et al., 2010). Hence it may be opined that Mondeville's efforts proved pivotal in the development of anatomy in medieval France.

CONTRIBUTIONS TO SURGERY

Mondeville was the first Frenchman to author a surgical text, *La Chirurgie*, which he began writing in 1306 (Fig. 4). The book documents his professional views, as well as gives significant insights into the status of medicine and surgery in the 14th century (Prioreschi, 2003). He divided the text into five parts: (1) Anatomy, (2) Wounds, (3) All surgical maladies except wounds, ulcers and affection of bones, (4) Affection of Bones and (5) the Antidotary. He could complete only the first two parts during his lifetime, whereas the third part was left incomplete. He did not even start with the fourth part due to his untimely death (Pilcher, 1895). His scholarly stature was appropriately reflected in the organization of his text. His style was simple, but original, and the text was written in a lucid manner with clear statements detailing his valuable work. Mondeville's influence on medieval surgical practice is apparent from the fact that his younger contemporary Guy de Chauliac frequently quoted Mondeville's text in his treatise *Chirurgia Magna*, which was one of the most influential textbook in the history of surgery (Haller, 1964). Mondeville was the first surgeon to practice ligation of arteries, which is documented in the chapter on amputation of limbs (Wyplosz, 2011). However, he may have got the idea from medieval Italian surgeons during his stay in Bologna. He documented the use of narcotics such as opium, mandragora and others being soaked in sponges, and held over the patient's nose to induce 'deep sleep' during surgery in order to alleviate pain (Macdougall, 2000). His most remarkable contribution in the field of surgery was the introduction of the aseptic method of treating wounds, which was a revolutionary concept in the 13th century (Cohen, 1995). The prevalent method of wound management in those days was to induce pus formation by probing the wound and applying suppurative agents within it, as medieval physicians believed that suppuration was useful to wound healing as it got rid of any toxins in the blood (Martin, 2008). Mondeville was the first medieval surgeon to demonstrate that pus formation was not essential to the healing of wounds (Clarke, 1931). He rarely probed a wound, tried to check blood loss as much as possible and sutured it at the earliest to minimize contact with air, which he believed was detrimental to wound healing. Initially, he would apply dry bandages over the area and later on clean the wound with wine, and applied bandages soaked with wine around the sutured area so as to absorb any moisture and prevent infection (Bonnichon, 2005). He was very much influenced in this respect by his teacher Theodoric Borgogni, who, along with his father Hugh of Lucca (1160-1257), pioneered the use of wine in wound management (Sarton, 1927-1948). After a few days, a piece of cloth with antiseptic plaster (made of juices of plantain, betony, ache, resin, wax and turpentine) was applied over the wound and a large dry compress was applied over the dressing as a whole. Mondeville had successfully tried his method of treatment on injured soldiers in the battlefield while accompanying the army with the King (Pilcher, 1895). However he faced violent criticism from his contemporary physicians, who considered him as a transgressor, for neglecting and disagreeing with their views (Icard, 2010). He even contemplated discarding his method and would have actually done so if not supported by the Count of Valois and other royal accomplishes, who had personally observed the effects of his treatment (Cohen, 1995). However, his method went into oblivion following his death and perished from surgical practice after Guy de Chauliac rejected it fifty years later (Icard, 2010). Mondeville's efforts were recognized six hundred years later with the revival of antiseptic surgery in modern times (Vidal, 1985). His manuscript, which was written entirely in Latin, was discovered many years later and was translated into French by E. Nicaise in 1893 and into German by Dr. Pagel in the same year. Mondeville's original work is preserved in the manuscript section of the Bibliotheque Nationale of Paris (Vrebos, 2011).

CONCLUSION

Henri de Mondeville's significant contributions in the fields of anatomy and surgery are seldom recognized in the academic domain. His innovative method of teaching anatomy from illustrations was unheard of during the medieval period, when progress of science was bogged down by religious and popular beliefs. He was instrumental in popularizing human dissection as a tool for teaching anatomy in medieval France. His exploits laid the platform for advancement of anatomical sciences during the Renaissance period. He devoted his life to the advancement of surgical practice and endeavored to establish surgery as a fundamental branch of medicine. Mondeville's *La Chirurgie* was the first book of surgery penned by a native Frenchman, and is one of the pillars of medieval surgery, but neither his contemporaries nor his immediate successors gave it the recognition it merited. His forgotten work deserves to be rediscovered and rehabilitated.

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