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Letter to the Editor

History Lessons: Human Anatomy, from its Origin to the Renaissance—Rhaze's Contributions to Morphological Sciences

Lecciones de Historia: Anatomía Humana, desde el Origen hasta el Renacimiento— Las Contribuciones de Al-Razi a las Ciencias Morfológicas

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To the Editor,

The insightful article *Lessons from History: Human Anatomy, from the Origin to the Renaissance* (Malomo *et al*., 2006) provides a valuable overview of the development of Anatomy from its origins to the Renaissance, highlighting the contributions of key figures such as Hippocrates, Galen, and Vesalius. However, it notably omits the significant influence of Arab and Persian medicine on this evolution, particularly the contributions of Rhazes (Al-Razi, 865–925 CE). He was a pioneer in the systematization of anatomical knowledge and the development of scientific methodologies in Medicine (Azizi, 2007; Shoja & Tubbs, 2007; Zarrintan *et al*., 2018). This letter seeks to highlight his essential contributions to Morphological Sciences.

Abu Bakr Muhammad ibn Zakariya al-Razi, widely known in the West as Rhazes, was born in 865 CE in Rayy, near present-day Tehran, Iran. Initially, he pursued music—he was fond of singing and playing the flute— but around the age of 30, he developed an interest in alchemy (Cortés *et al*., 2018; Cortés, 2019). Later, he turned to medicine, a discipline in which he excelled, eventually becoming the Chief Director of the leading hospital in Baghdad, Iraq (Azizi, 2007). A polymath, Rhazes wrote extensively on a wide range of subjects, including medicine, alchemy, philosophy, theology, astronomy, and mathematics (Cortés *et al*., 2018; Cortés, 2019; Afshar & Tabrizi, 2020).

Rhazes is widely regarded as one of the most distinguished physicians of the Middle Ages. His seminal work, Kitab al-Hawi *(Liber Continens*) (Razi, 1529), not only synthesized Greco-Roman medical teachings but also included his own clinical observations regarding human physiology and disease (Sadi, 1935; Afshar & Tabrizi, 2020). His emphasis on pathological anatomy, his advocacy for empirical experimentation, and his differentiation between tendons, ligaments, and nerves illustrate his substantial contributions to Morphological Sciences, predating the European Renaissance (Ashtiyani *et al*., 2011). His medical expertise was not limited to theoretical knowledge. He was the first to differentiate smallpox from measles and other exanthematous diseases (Castiglioni, 2019). He also pioneered the use of animal gut for sutures and introduced various new remedies, such as mercurial ointments (Castiglioni, 2019). Some of his key contributions to the study of anatomo-physiological systems are summarized below (Table I).

Additionally, Rhazes was a pioneer in medical education, advocating for supervised clinical practice—a model strongly resembling contemporary medical training (Sadi, 1935). His approach, rooted in empirical observation and the rejection of erroneous teachings, such as certain flawed doctrines of Galen, positions him as a forerunner of the scientific method in medicine (Zarrintan *et al*., 2018).

Finally, Rhazes' cultural legacy—often referred to as the 'Arab Galen'—is immense and undoubtedly shaped a pivotal era in the history of Classical Medicine and the broader development of health sciences (Cortés *et al*., 2018; Castiglioni, 2019; Cortés, 2019). Incorporating the contributions of Arab and Persian medicine, particularly those of Rhazes, would significantly enhance the historical perspective presented in the article by Malomo *et al*. (2006). Rhazes' legacy in anatomical studies and clinical medicine is undeniable and merits recognition in the evolution of morphological knowledge that laid the foundations of modern medical science.

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Table I. Contributions of Rhazes to the study of human anatomo-physiological systems.

Anatomo-physiological System	Contribution	Source
Musculoskeletal System	Differentiation between tendons, ligaments, and nerves. Descriptions on the bones. Description of surgical techniques for fractures and osteomyelitis	Afshar & Tabrizi (2020)
Nervous System	Significant contributions to Neuroanatomy. Development of pathological anatomy. Critiques and corrections to Galen's errors.	Shoja & Tubbs (2007); Afshar & Tabrizi (2020); Zarrintan *et al.* (2018)
Cardiovascular System	Descriptions on the heart. Differentiation between arteries and veins.	Shoja & Tubbs (2007).
Respiratory System	Early identification of respiratory allergies and their relationship with environmental factors.	Azizi (2007)
Digestive System	Study of digestive disorders and their morphological symptoms.	Shoja & Tubbs (2007)
Immune System	Observations on the body's response to infectious diseases.	Sadi (1935); Castiglioni (2019)
Urinary System	Observations on the pathophysiology of the urinary tract and venereal diseases, and in the treatment of kidney and bladder calculi.	Ashtiyani *et al.* (2011).

REFERENCES

Afshar, A. & Tabrizi, A. Razi and his concepts on bone and joint disorders. *Arch. Iran. Med., 23(9)*:624-8, 2020.

Ashtiyani, S. C.; Shamsi, M.; Cyrus, A.; Bastani, B. & Tabatabayei, S. M. A critical review of the works of pioneer physicians on kidney diseases in ancient Iran: Avicenna, Rhazes, Al-akhawayni, and Jorjani. *Iran. J. Kidney Dis., 5(5)*:300-8, 2011.

Azizi, M. H. The otorhinolaryngologic concepts as viewed by Rhazes and Avicenna. *Arch. Iran. Med., 10(4)*:552-5, 2007.

Castiglioni, A. *A History of Medicine.* 2nd ed. Abingdon, Taylor & Francis, 2019.

Cortés, M. E.; Hernández, J.; Cristi Recabarren, E. & del Río, J. P. *Remembering Muhammad ibn Zakariya Al-Razi: Classical Physician, Chemist and Philosopher.* In: Sulaiman, H. A. (Ed.). . Lecture Notes on Multidisciplinary Research and Application. Melaka, Malaysia Technical Scientist Association, 2018. pp.37-40.

Cortés, M. E. *Al-Razi: entre la Medicina, la Alquimia y la Filosofía.* In: Lértora Mendoza, C. A. & Violante, S. B. (Eds). Temas y Problemas de Filosofía Medieval: Miscelánea. Buenos Aires, Ediciones RLFM, 2019. pp.31-40.

Malomo, A. O.; Idowu, O. E. & Osuagwu, F. C. Lessons from History: Human Anatomy, from the Origin to the Renaissance. *Int. J. Morphol., 24(1)*:99-104, 2006.

Razi, A. B. M. Z. *The Comprehensive Book on Medicine (Continens Rasis)*. Venice, Johannes Hamman, 1529. Available from: www.loc.gov/item/2021666821/

Sadi, L. M. The millennium of Ar-Razi (Rhazes). *Ann. Med. Hist., 7(1)*:62-72, 1935.

Shoja, M. M. & Tubbs, R. S. The history of anatomy in Persia. *J. Anat., 210(4)*:359-78, 2007.

Zarrintan, S.; Shahnaee, A. & Aslanabadi, S. Rhazes (AD 865-925) and his early contributions to the field of pediatrics. *Childs Nerv. Syst., 34(8)*:1435-8, 2018.

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