

## VIEWPOINT

## THE ARTS AND MEDICINE

# The Heart as a “Balance” in Everyday and After Life



## Lessons From Ancient Egypt\*

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Throughout the millennia, the heart has fascinated countless generations, cultures, and civilizations. Beyond the intrinsic curiosity for its anatomic and physiologic secrets, humans have always reflected about the putative role of the heart at the crossroads between its physical dimension, the emotions, and the mind.<sup>1,2</sup> Nevertheless, it is interesting to notice that it was only in recent decades that psychological stressors and social determinants have surfaced as emerging and relevant risk factors for cardiovascular disease.<sup>3,4</sup> As this framework gains increasing momentum in current practice, it is of interest to reflect on past concepts regarding the role of the heart at the intersection between its physical and emotional dimensions.

Ancient Egypt was one of the most extraordinary and enduring civilizations of humankind. The Egyptian civilization left a deep and long-lasting legacy across several fields of human endeavor, including in cardiovascular medicine.<sup>5-7</sup> Notably, the “Papyrus Ebers” (so-called because several centuries later it was bought by the German Egyptologist Georg Ebers) is one of the best-preserved sources concerning medical topics and dates from around the 16th century BCE. It includes several references about the

cardiovascular system.<sup>2,7,8</sup> Although a detailed understanding of the circulatory system and pulse would take many more centuries to mature, it is enthralling to appreciate the descriptions in this document hypothesizing that the heart could be assessed at different locations in the body, whereas if it “trembled” (both possibly relating to an early perception of the pulse), it would mean that a disease could be advancing.<sup>8,9</sup>

The lavish illustration depicted in **Figure 1** provides another remarkable and intriguing outlook about the central importance that the heart exerted throughout the centuries and especially in this complex society.<sup>5,10-13</sup> At that time, Egyptians viewed the heart as the center of emotions but also as the center of memory, thought, and personality. As such, the heart was able to record each person’s actions throughout life, thus becoming “heavier” by the burden and amount of “bad actions.”<sup>5,7</sup> The paramount role of the heart in ancient Egyptian culture is also underscored by the fact that, contrary to most organs, the heart was intentionally left inside the body at the time of mummification to allow the deceased an appropriate passage to eternal life.<sup>2,5,14</sup>

In more detail, this figure is part of the Papyrus of Hunefer, a royal scribe from the 19th Dynasty, circa the 13th century BCE. It illustrates the “weighing of the heart,” one of the most important steps described in the *Book of the Dead*, a collection of spells aimed at assisting the deceased in the journey to the afterlife.<sup>5,10</sup> In the left part of the figure, we can see the deceased man (dressed in white) taken into the judgment hall by the jackal-headed god Anubis. In the center of the composition, we can assist to the most important step, where the heart can be seen inside the vase being put on a balance, where it is being weighed in the Hall of Two Truths by Anubis against the feather of Maat (also sometimes styled as

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**FIGURE 1** *Book of the Dead of Hunefer, Circa 1285 BCE (19th Dynasty), The British Museum*

This detail scene from the Papyrus of Hunefer (circa 1285 BCE), shows the heart of the scribe Hunefer (which is contained inside the vase) being weighed by the jackal-headed god Anubis on a scale against the feather of truth of Maat. The ibis-headed god Thoth, who is considered the scribe of the gods, records the result. If the heart is lighter than the feather, Hunefer is to be allowed to continue the journey into the afterlife. If not, the heart is to be eaten by Ammit, the devouring creature who is chimeric of a crocodile, a lion, and a hippopotamus. Reproduced from *Wikipedia*.<sup>10</sup> This photographic reproduction falls within the public domain.

Ma'at), the goddess of Truth.<sup>5,13</sup> To pass to the next step in the journey to the afterlife, the heart should be “lighter” than the feather. This important moment is recorded by the divine scribe Thoth (the ibis-headed figure, at the center), who is seen next to Ammit (sometimes referred to as Ammut, which is the chimeric figure with the head of a crocodile, the front legs of a lion, and the hindquarters of a hippopotamus, thus representing some of the fearsome animals of both land and river), who stands guard attentively while waiting for the result of the judgment.<sup>5,11-13</sup> This critical moment is also watched carefully by the god Osiris (whose domain encompassed also the Underworld), the green figure in white attire to the far right, seated in his shrine surrounded by Isis and Nephthys, and a panel of judges who observe the judgment as the individual denies having performed several wrongful actions. The deceased heart must provide confirmation to these claims, as the ancient Egyptians believed that the heart—as the seat of the emotions, the intellect, and the character—would record the good or bad aspects of a person’s life.<sup>5,13</sup> The pivotal importance attributed by Egyptians to this step can also be found in the archaeological findings of so-called “heart scarabs,”

amulets made of stone with the form of a heart or scarab beetle. A heart scarab was a very valuable item imbued with a specific spell that was placed among the mummy’s wrappings, aiming to silence the heart from possibly denouncing its master during the trial at this hall.<sup>5,12</sup> Should the individual have a “light” heart and pass this crucial stage of weighing the heart, he or she would be led afterward by the falcon-headed god Horus to Osiris and awarded passage. On the contrary, if the heart was “heavy,” it would be cast to Ammit (the chimeric animal figure in the center), who would devour it and, as such, erase the individual’s personality, memories, and identity.<sup>5,15,16</sup>

The powerful depiction of the “weighing of the heart” tells us a lot about the role of the heart in ancient Egypt. Indeed, although its manifestly symbolic nature should be acknowledged in a contemporary setting, it nonetheless reinforces the even more prominent role that the heart played in the ancient world, as also attested by many other civilizations.<sup>1,17</sup> Some of these include distant regions such as the Mesoamerican cultures—where the concept of the heart as the center of passion has also been suggested—but also, for example, in ancient Greece,

where this “cardiocentric” view of the heart as the center of the soul and emotions would later be challenged by pioneers such as Herophilus.<sup>17-19</sup>

Despite its allegoric nature, the notion imbued in this illustration that an individual’s actions throughout life could have a distinct impact (whether positive or negative) on the heart can resonate with present day settings.<sup>4,20</sup> The concept that not only the presence of a given cardiovascular risk factor (such as smoking and dyslipidemia) but also the duration and intensity of exposure could be relevant in terms of disease expression resonates deeply with this metaphoric portrayal.<sup>4</sup> Moreover, the mentioned relationship between cardiovascular and psychological pathologies (across different contexts) once more recalls the ancient notions of the interdependence between the heart and mind. Indeed, adhering to healthy lifestyles throughout life can reduce the burden of disease across different stages of the cardiovascular continuum, as attested by current guidelines.<sup>4</sup> In addition, both genetic pathologies (such as hypertrophic cardiomyopathy) and others, such as storage disorders (namely, Fabry disease and hemochromatosis) with progressive accumulation of different materials leading to a “heavier” and dysfunctional heart, also draw close parallels to this illustration.<sup>21,22</sup> Of note, inasmuch as ancient Egyptians placed substantial importance in “heart scarabs” to protect oneself from the (figurative) burden of a “heavy heart,” so too could the current use of implantable cardioverter-defibrillators in diseases such as hypertrophic cardiomyopathy be viewed as a modern day iteration of this item, used as a way to protect the individual from adverse events linked to a (nonfigurative) “heavy heart.” As such, even thousands of years after the depiction of the “weighing of the heart,” an overall equilibrium of both physical and psychological factors can still lead to a healthier heart, providing a direct link to a “lighter heart” as ascribed by our forefathers from this bygone era.

Finally, ancient Egypt keeps providing relevant inputs to our understanding of cardiovascular disease.<sup>6,15,23,24</sup> Although atherosclerotic disease is

oftentimes associated with modern societies and lifestyles, findings from studies on mummies from different time periods are challenging this notion.<sup>6,15,23,24</sup> Although atherosclerotic disease in the ancient Egyptian civilization was described more than 150 years ago in an autopsy study, more recent studies using computed tomography have provided novel insights.<sup>23,24</sup> Data from the Horus study, where mummies from diverse geographic regions (including Egypt but also the Americas and the Aleutian Islands) were subjected to computed tomography scans, show that atherosclerosis was already common thousands of years ago.<sup>24</sup> Although the full scope of these findings remains to be fully ascertained, these have nonetheless challenged prior paradigms concerning the pathophysiology of atherosclerosis, leading to a renewed interest in the interplay and potential relative role of ancillary factors such as the environment, genetics, and inflammation.<sup>24,25</sup>

Medicine continues to progressively evolve into an increasingly integrative discipline. The incorporation of knowledge from a range of diverse fields, while maintaining a strong focus on its core tenets, can allow for an ever more personalized and tailored approach to the individual patient. Reflecting on some of the concepts echoing from ancient Egypt should inspire us as we push forward and keep unravelling some of the sundry mysteries of the heart, a highly complex and multidimensional organ, seated prominently at the intersection of several facets of human life.

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#### REFERENCES

1. Loukas M, Youssef P, Gielecki J, Walocha J, Natsis K, Tubbs RS. History of cardiac anatomy: a comprehensive review from the Egyptians to today. *Clin Anat*. 2016;29:270-284.
2. Barr J. Vascular medicine and surgery in ancient Egypt. *J Vasc Surg*. 2014;60:260-263.
3. Powell-Wiley TM, Baumer Y, Baah FO, et al. Social determinants of cardiovascular disease. *Circ Res*. 2022;130:782-799.
4. Visseren FLJ, Mach F, Smulders YM, et al. 2021 ESC guidelines on cardiovascular disease prevention in clinical practice. *Eur Heart J*. 2021;42:3227-3337.
5. Silverman DP, ed. *Ancient Egypt*. Duncan Baird Publishers; 2003.
6. Allam AH, Thompson RC, Wann LS, Miyamoto MI, Thomas GS. Computed tomographic assessment of atherosclerosis in ancient Egyptian mummies. *JAMA*. 2009;302:2091-2094.

7. Boisaubin EV. Cardiology in ancient Egypt. *Tex Heart Inst J*. 1988;15:80–85.
8. Saba MM, Ventura HO, Saleh M, Mehra MR. Ancient Egyptian medicine and the concept of heart failure. *J Card Fail*. 2006;12:416–421.
9. Reeves C. *Egyptian Medicine*. Shire Egyptology; no. 15. Shire Publications; 2001.
10. Papyrus of Hunefer. Wikipedia. Accessed December 12, 2022. [https://commons.wikimedia.org/wiki/File:Book\\_of\\_the\\_Dead\\_of\\_Hunefer\\_sheet\\_3.jpg](https://commons.wikimedia.org/wiki/File:Book_of_the_Dead_of_Hunefer_sheet_3.jpg)
11. Carelli F. The book of death: weighing your heart. *London J Prim Care (Abingdon)*. 2011;4:86–87.
12. Scalf F, ed. *Book of the Dead: Becoming God in Ancient Egypt*. The Oriental Institute of the University of Chicago; 2017.
13. Hart G. *The Routledge Dictionary of Egyptian Gods and Goddesses*. Routledge; 2005.
14. Bongartz L, Cramer MJ, Joles J. Origins of cardiorenal syndrome and the cardiorenal connection. *Chronic Kidney Dis*. 2012;7:107–122.
15. Thomas GS, Wann LS, Allam AH, et al. Why did ancient people have atherosclerosis? From autopsies to computed tomography to potential causes. *Glob Heart*. 2014;9:229–237.
16. Budge EAW. *The Book of the Dead*. Kegan Paul, Trench, Trubner and Co; 1898.
17. Fontes-Carvalho R, Vilela E. Heart, soul, and medical practice: Clinical lessons from ancient Alexandria. *J Am Coll Cardiol Case Rep*. 2019;1:83–84.
18. Bendersky G. The Olmec heart effigy: earliest image of the human heart. *Perspect Biol Med*. 1997;40:348–361.
19. Crivellato E, Ribatti D. Soul, mind, brain: Greek philosophy and the birth of neuroscience. *Brain Res Bull*. 2007;71:327–336.
20. Lv J, Yu C, Guo Y, et al. Adherence to healthy lifestyle and cardiovascular diseases in the Chinese population. *J Am Coll Cardiol*. 2017;69:1116–1125.
21. Pereira NL, Grogan M, Dec GW. Spectrum of restrictive and infiltrative cardiomyopathies: part 1 of a 2-part series. *J Am Coll Cardiol*. 2018;71:1130–1148.
22. Ommen SR, Mital S, Burke MA, et al. 2020 AHA/ACC guideline for the diagnosis and treatment of patients with hypertrophic cardiomyopathy: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2020;76:e159–e240.
23. Allam AH, Thompson RC, Wann LS, et al. Atherosclerosis in ancient Egyptian mummies: the Horus study. *J Am Coll Cardiol Img*. 2011;4:315–327.
24. Thompson RC, Allam AH, Lombardi GP, et al. Atherosclerosis across 4000 years of human history: the Horus study of four ancient populations. *Lancet*. 2013;381:1211–1222.
25. Ditaranto R, Vitale G, Lorenzini M, Rapezzi C. The complex interplay between fitness, genetics, lifestyle, and inflammation in the pathogenesis of coronary atherosclerosis: lessons from the Amazon rainforest. *Eur Heart J Suppl*. 2019;21(suppl B):B76–B79.

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