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Araştırma Makalesi/Research Article

A Preliminary Study on Chapters Related to Human Anatomy in An Illustrated Persian Medical Book: *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī*[*]

Ahmet Acıduman[**]- Şehriyar Şems[***]- Berna Arda[****] - Gürhan Kırilen[*****]

Abstract

Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī is one of the rarest illustrated medical books in medieval Islamic geography. It is also one of the most uncommon books translated into Persian from Chinese belonging to Cathay medicine in the Islamic world during that era. The *Tānksūqnāme* was translated by order of Faḍlallāh Rashīd al-Dīn b. ʿImād al-Dawla Abū al-Khayr (1247-1318), after Oljeitu Khodabandeh (r. 1304 – 1317) became the ruler in 1304. One of the rarest, probably the unique copy of the *Tānksūqnāme-i Īlkhān* is in Ayasofya collection, Nr. 3596 in İstanbul Süleymaniye Manuscript Library. Although the work consists of four volumes/books, we only have the first one. It was copied by a scribe, Muḥammad b. Aḥmad b. Maḥmūd Qiwām (Qawwām) al-Kirmānī, in Tabrīz on 20 Shaʿbān 713/10 December 1313 during the reign of Oljeitu Khodabandeh, the eighth ruler of Ilkhanid dynasty in Persia. The first

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** Prof., Ankara University, Faculty of Medicine, Department of History of Medicine and Ethics, Ankara/TÜRKİYE, aciduman@medicine.ankara.edu.tr, ORCID: 0000-0003-2021-4471

*** DMD., Şems Health, Ankara/TÜRKİYE, ssems2011@gmail.com, ORCID: 0000-0003-3107-0514

**** Prof., Ankara University, Faculty of Medicine, Department of History of Medicine and Ethics, Ankara/TÜRKİYE, berna.arda@medicine.ankara.edu.tr, ORCID: 0000-0003-2043-2444

***** Assoc. Prof., Ankara University of Languages and History-Geography, Department of Eastern Languages and Literatures, Department of Sinology, Ankara/TÜRKİYE, kirilen@ankara.edu.tr, ORCID: 0000-0002-1599-1316

volume of *Tānksūqnāme-i Īlkhān Der Funūn-i Ulūm-i Khaṭā'ī* has chapters and illustrations on human anatomy written and drawn following the Chinese originals. The aim of this study is to present the anatomical knowledge in this book and evaluate it by comparing the classical scientific anatomical knowledge of medieval Islamic medicine.

Keywords: *Tānksūqnāme-i Īlkhān Der Funūn-i Ulūm-i Khaṭā'ī*, Faḍlallāh Rashīd al-Dīn, Oljeitu Khodabandeh, Cathay medicine, Ilkhanid dynasty, History of medicine.

Resimli Bir Farsça Tıp Kitabındaki İnsan Anatomisi ile İlgili Bölümler Üzerine Bir Ön Çalışma: *Tānksūḳnāme-i Īlḫān Der Funūn-i Ulūm-i Ḫaṭā'ī*

Öz

Tānksūḳnāme-i Īlkhān der Funūn-i Ulūm-i Ḫaṭā'ī Orta Çağ'da İslam coğrafyasında yazılmış nadir resimli tıp kitaplarından ve aynı zamanda o dönemde İslam dünyasında Hitay tıbbına ait Çinceden Farsçaya çevrilmiş en nadir eserlerden birisidir. *Tānksūḳnāme* Olcāytū Ḫudābende (1304-1317) 1304'te hükümdar olduktan sonra, Faḍlullāh Reşīdu'd-dīn b. 'İmādu'd-devle Ebū'l-Ḫayr'ın (1247-1318) emriyle tercüme edilmiştir. *Tānksūḳnāme-i Īlkhān*'ın en nadide, muhtemelen tek nüshası İstanbul Süleymaniye Yazma Eser Kütüphanesi Ayasofya Koleksiyonunda, No. 3596'da bulunmaktadır. Eser dört cilt/kitaptan oluşsa da elimizde sadece birincisi bulunmaktadır. Bu nüsha Muḥammed b. Aḥmed b. Maḥmūd Ḳıvām (Ḳavvām) el-Kirmānī tarafından 20 Şa'bān 713/10 Aralık 1313'te Tebriz'de İlhanlı hanedanının İran'daki sekizinci hükümdarı Olcāytū Ḫudābende'nin saltanatı sırasında kopyalanmıştır. *Tānksūḳnāme-i Īlkhān der Funūn-i Ulūm-i Ḫaṭā'ī*'nin ilk cildi, Çince asıllarına uygun olarak insan anatomisi üzerine yazılmış bölümler ve çizilmiş resimler içermektedir. Bu çalışmanın amacı bu kitaptaki anatomik bilgilerin sunulması ve Orta Çağ İslam tıbbının klasik bilimsel anatomik bilgileriyle karşılaştırılarak değerlendirilmesidir.

Anahtar Kelimeler: *Tānksūḳnāme-i Īlḫān der Funūn-i Ulūm-i Ḫaṭā'ī,* Faḍlullāh Reşīdu'd-dīn, Olcāytū Ḫudābende, Hitay tıbbı, İlhanlı hanedanı, Tıp tarihi.

Introduction

Tānksūqnāme-i Īlkhān Der Funūn-i Ulūm-i Khaṭā'ī (The Treasury of Ilkhans on Cathay Sciences and Techniques) is one of the rarest illustrated medical books in medieval Islamic geography. It is also one of the most uncommon books translated into Persian from Chinese belonging to Khaṭā'ī (Cathay) medicine in Islamic geography during that era.

Tānksūqnāme-i Īlkhān Der Funūn-i Ulūm-i Khaṭā'ī was introduced to the world of science and the history of medicine by Turkish medical historian Prof. A Süheyl Ünver in 1939. The book's introduction section and some parts were translated into Turkish

from Persian by A. Baki Gölpınarlı[1]. The book's translator and also the name of the ruler of that time mentioned as the Monarch (Pād-shāh) of Islam in the book are unknown. Gölpınarlı believed that "the Pād-shāh of Islam" was Maḥmūd Ghāzān (r. 1295-1304), the predecessor of Oljeitu Khodabandeh[2].

An article on the *Tānksūqnāme-i Īlkhān* written by Abdulhak Adnan [Adıvar] in French was published in *Isis* in 1940[3]. Abdulhak Adnan propounded that the work was written during Oljeitu Khodabandeh (r. 1304-1317). He also guessed that the translator of the work could be Faḍlallāh Rashīd al-Dīn b. ʿImād al-Dawla Abū al-Khayr (1247-1318), who was also known as a physician, referring to the introduction of the Arabic edition of his work entitled *Ǧāmiʿ al-Taṣānīf al-Rashīdī*[4].

A. Süheyl Ünver also published an article on the *Tānksūqnāme-i Īlkhān* in English in *İstanbul Üniversitesi Tıb Fakültesi Mecmuası* (Journal of İstanbul University, Faculty of Medicine), in 1944[5].

Saburō Miyasita revealed the origins of the anatomical drawings in *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī* in his article in *Isis* in 1967[6]. He reported that the first anatomical dissection was performed in China in 1045, and Sung Ching illustrated the internal organs of rebellious Ou Hsi-fan and his friends. He stated that *Ts'un hsin huan chung t'u (Illustrations of Internal Organs and Circulatory Vessels)* preserves Sung Ching's works in the anatomical section by Yang Chieh, physician of Anhui, appeared in 1113, but the original text was lost[7]. He also compared the illustrations of the internal organs in the *Tānksūqnāme* with the illustrations in the Yuan edition of the *Hua t'o nei chao t'u* containing anatomical drawings from Yang Chieh's work. He concluded that the drawings in the *Tānksūqnāme* are based on this work[8].

1 A. Süheyl Ünver, *Tanksuknamei İlhan der Fûnunu Ulûmu Hatai Mukaddimesi*, transl. Baki Gölpınarlı, İstanbul Üniversitesi Tıb Tarihi Enstitüsü, İstanbul 1939.

2 Ünver, *Ibid*, p. 8.

3 Abdulhak Adnan, "Sur le Tanksukname-I-Ilhani der Ulum-U-Funun-I-Khatai", *Isis,* XXXII/1, 1940, pp. 44-47.

4 Abdulhak Adnan, *Ibid*, p. 46.

5 A. Süheyl Ünver, "Recent Researches on the Wang Shu Ho Text", *İstanbul Üniversitesi Tıb Fakültesi Mecmuası,* VII/2 (1944), pp. 3874-3876.

6 Saburō Miyasita, "A Link in the Westward Transmission of Chinese Anatomy in the Later Middle Ages", *Isis,* LVIII/4, 1967, pp. 486-490.

7 Miyasita, *Ibid*, pp. 486-487.

8 Miyasita, *Ibid,* pp. 488-490.

Pierre Huard wrote an article on the *Tānksūqnāme-i Īlkhān*[9]. In his article, after introducing the *Tānksūqnāme-i Īlkhān*, he gave information about Wang Shu Ho and his work *Mö-King* and its apocryphal edition *Mö-Kue* and he then gave explanations about the anatomical dissections performed in China. Huard, quoting Maspero, reported that in Traditional China, two sets of dissections were performed with an interval of about a thousand years, the first in 16 and the second in 1106. Noting that the dissections in 1106 were attributed to Yang Chieh, Huard stated that the source of the drawings published in 1113 by Yang Chieh is the Sung Ching. He also revealed that no complete translation of this work has not yet been undertaken in any Western language.[10]

Felix Klein-Franke and Zhu Ming wrote two articles on Rashīd al-Dīn and the *Tānksūqnāme*[11,12]. In the first article, Klein-Franke and Ming reported that the *Tānksūqnāme* was the first translation from the Chinese medical literature to a foreign language. In this context, Rashīd al-Dīn compared himself to the ʿAbbāsid caliph Hārūn al-Rashīd[13]. They emphasized that Rashīd al-Dīn tried to integrate Chinese medicine with Greco-Islamic medicine. At the same time, the *Tānksūqnāme* was reshaped because it was a necessity so that the Muslim reader would not be disturbed[14]. The book consists of two independent parts, the first part is the preface of Rashīd al-Dīn, and the second part is the *Tānksūqnāme* that follows it[15]. Although it was stated in the *Tānksūqnāme* that the work was Wang Shu hé's *Mai Jue*, Klein-Franke and Ming explained that there are striking similarities between the *Tānksūqnāme* and Gao Yang-sheng's *Mai Jue*. As a result of the comparisons between these two works, they argued that the primary source of the *Tānksūqnāme* is Gao Yang sheng's *Mai Jue*[16]. The authors also counted the physicians named Ji Dai-meng, Xin Jin-fang, Su Jiu-xin, Li Men-shu, and Du Gui-dong, among the other sources of the *Tānksūqnāme*[17].

9 Pierre Huard, "A Propos du Tenk Suk Name (Tenksuq-nameh)", *Méridiens : Revue de l'Association Scientifique des Médecins Acupuncteurs,* 37-38, 1977, pp. 11-16.

10 Huard, *ibid*, pp. 11-14.

11 Felix Klein-Franke and Zhu Ming, "Rashīd ad-Dīn as a Transmitter of Chinese Medicine to the West", *Le Muséon,* CIX/3, 1996, pp. 395-404.

12 Felix Klein-Franke and Zhu Ming, "Rashid ad-Din and the Tansuqnamah: the earliest translation of Chinese medical literature in the West," *Le Muséon* CXI/3-4, 1998, pp. 427-445.

13 Klein-Franke and Ming, "Rashīd ad-Dīn as a Transmitter", p. 399.

14 Klein-Franke and Ming, "Rashīd ad-Dīn as a Transmitter", pp. 398-399.

15 Klein-Franke and Ming, "Rashīd ad-Dīn as a Transmitter", p. 400.

16 Klein-Franke and Ming, "Rashīd ad-Dīn as a Transmitter", p. 401.

17 Klein-Franke and Ming, "Rashīd ad-Dīn as a Transmitter", p. 402.

In the second article, Klein-Franke and Ming, as a result of their detailed analysis, stated that the *Tānksūqnāme* was translated by order of Rashīd al-Dīn, after Oljeitu Khodabandeh became the ruler in 1304,[18] and they claimed that although the author of *Mai Jing* is mentioned in the *Tānksūqnāme*, the *Tānksūqnāme* is not Wang Shu hé's *Mai Jing* but is mainly based on *Mai Jue* and its explanations. While determining its origin, they compared the *Tānksūqnāme* with Dai Qizong's *Mai Jue Kan Wu*[19]. They also stated that the *Tānksūqnāme* is very important since it is the first Chinese medical literature that has been transferred to the Islamic West by then[20].

Persis Berlekamp, in her valuable article,[21] criticized some of Miyasita's information and stated that the work from which organ drawings in the *Tānksūqnāme* were taken was not a Yuan-period (1271-1368) edition of the medical work, *Hua Tuo Neizhaotu*, attributed to the Han dynasty (206 BC-AD 220) writer Hua Tuo,[22] but dated to around 1095 during the Song period (960-1279). Furthermore, she claimed that this information is not correct, because the earliest surviving imprints of this work are not from the Yuan period, but the Ming (1368-1644)[23]. She also

18 "Rashid ad-Din did not mention in which year he ordered the *Tansuqnamah* to be translated from Chinese into Persian. From a remark in his autobiographic treatise "*Response to the Slandering Adversaries*" which is part of his scientific writings (*al-Madjmuah, at-Taudihat*, 9th treatise), we learn that he began to write literary works only after Öldjeitü's accession to the throne in 1304. That means that the *Tansuqnamah* was translated between 1304 – 1313, probably in the lastly mentioned year when Rashid ad-Din was already 66 years old." Klein-Franke and Ming, "Rashid ad-Din and the Tansuqnamah", p. 427.

19 "We used Dai Qizong's Mai Jue Kan Wu as main support for identifying the source of Tansuqnamah because of two reasons. Firstly, Dai Qizong's Mai Jue Kan Wu preserves almost whole text of Mai Jue which was very helpful for us to identify the Arabic "Pinyin" transcription of the Chinese poetical portions in Tansuqnamah. Secondly, Mai Jue Kan Wu and Tansuknamah were compiled almost at the same time, i.e. the Yuan dynasty. The fact provided the possibility of collating both books more closely and more precisely." Klein-Franke and Ming, "Rashid ad-Din and the Tansuqnamah", p. 429.

20 Klein-Franke and Ming, "Rashid ad-Din and the Tansuqnamah", p. 444.

21 Persis Berlekamp, "The Limits of Artistic Exchange in Fourteenth-Century Tabriz: The Paradox of Rashid al-Din's Book on Chinese Medicine, Part I", *Muqarnas: An Annual on the Visual Culture of the Islamic World,* XXVII, 2010, pp. 209-250.

22 "For example, Miyasita's article includes visually compelling comparisons between the *Tansūqnāma* images of organs and corresponding Chinese images. Tantalizingly, but misleadingly Miyasita identifies his Chinese visual comparanda as having come from a Yuan-period edition of a medical treatise that, according to a Chinese tradition rejected by modern scholars, was attributed to the Han dynasty-period (206 B.C. – A.D. 220) author Hua Tuo (d. 208): *Hua Tuo Neizhaotu* (Hua Tuo's Illuminating Illustrations of Internal Medicine). From an art-historical point of view, the intriguing thing about this reference is that it would seem to suggest that prints of Chinese comparanda for the *Tansūqnāma* images, or at least the images of the organs, survive in Yuan-period editions–in other words, in editions that date from roughly the same period as the *Tansūqnāma* itself." *Ibid*, pp. 214-215.

23 "However, my research assistant, Catherine Stuer, was able to determine that Miyasita's reference to

made the following statement about the drawings in the *Tānksūqnāme*:

> "All these images [bodily images] are startling because, without a framing outline of the general contours of the exterior human form with head, torso, and limbs, the organs appear to have been removed from the body. Indeed, they are historically linked to instances of dissection in China, and this is the aspect that has attracted the most attention in the modern world. The visual separation of the organs from the body's exterior outline may also have been important to how the *Tansūqnāma* was understood in fourteenth-century Tabriz, but unambiguously so"[24].

The first volume of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī* has chapters and illustrations, according to Ünver,[25] probably drawn following the Chinese originals and in Chinese and Central Asian drawing styles, which was very famous in the Turkish and Iranian provinces at that time, on human anatomy. This study aims to present and evaluate the anatomical knowledge in the book comparing the classical scientific anatomical knowledge of medieval Islamic medicine.

Material and Method

One of the rarest, maybe the unique copy of the *Tānksūqnāme-i Īlkhān*, which is in Ayasofya collection, Nr. 3596 in İstanbul Süleymaniye Manuscript Library was studied (Figure 1)[26]. Although the work consists of four volumes/books, we only have the first one[27]. It was copied by a scribe whose name was Muḥammad b. Aḥmad b. Maḥmūd Qiwām (Qawwām) al-Kirmānī in Tabrīz on 20 Shaʿbān 713/10 December 1313 during the reign of Oljeitu Khodabandeh, the eighth ruler of Ilkhanid dynasty in Persia (r. 1304-1316)[28].

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the Yuan edition is seriously misleading oversimplication. Miyasita mentions that he learned about this edition from an article by the Japanese scholar Kozo Watanabe, who traces the history of the text in question and explains that, despite the Han-dynasty attribution, the work actually dates to about 1095, under the Song. But even more importantly for the purposes of the current discussion, he explains that the earliest surviving imprints of this text date from the Ming period – the oldest one from the second half of the fifteenth century" *Ibid*, p. 215.

24 *Ibid*, p. 223.

25 Ünver, *Tanksukname Mukaddimesi*, pp. 10-11.

26 *Tānksūqnāme-i Īlkhān der Funūn-i ʿUlūm-i Khaṭāʾī*, İstanbul Süleymaniye Manuscript Library, Ayasofya Collection, Nr. 3596.

27 Ünver, *Tanksukname Mukaddimesi*, p. 11.

28 Abdulhak Adnan, *ibid,* p. 44.

The first book of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī* consists of 12 chapters, which are divided into sections and subdivisions[29].

Figure 1: The first page of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī* in Ayasofya Collection, Nr. 3596, in Süleymaniye Manuscript Library, İstanbul, Türkiye (Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

Sections related to anatomy appear in the 2nd and the 3rd chapters of the book. The first six sections of the 2nd chapter are on thoracic and abdominal viscera.[30] The 8th section of the 3rd chapter covers the brain and the spinal cord[31]. The

29 Ünver, *Tanksukname Mukaddimesi*, p. 48-59; Klein-Franke and Ming, "Rashid ad-Din and the Tansuqnamah", p. 429.

30 "بَابُ دُوُم از كتَاب وانكْ شُو خُوْ دَرْ نُو كِنكْ تُو يَعنِى دَرْ شَرْح اَعضَاءِ اندَرُونى وَ اين بَابْ را ايشان كِوَنْ دِى دِد يَعنِى قِسْم دُوَم وَ اين مُشتَمل اسْت بَرْ شَانْزده فَصل؛ فَصلِ اوَّل از بَاب دُوَم دَرْ سخنان يِنْ لُو مِزْ كه افضَال حكماءِ خطاى بُودَهْ اَسْت؛ فَصْلِ دُوُم از بَاب دوُم دَرْ تشرِيح قَلْب وَ شِرْيَانَات اوو كيفِيَّت ممَرْ هَرْ عرقى اَز اوُ وَ اين فَصلْ را سِمْ مى تُو ميگوُيند؛ فَصْلِ سِوُمْ دَرْ تَشْرِيح كِى خَىْ كِكْ مُو تُو يَعنى شرح حجاب وَ صُورتْ مرورْ نفسْ دَرْ او ميْگويدْ؛ فَصْلِ چِهارُمْ دَرْ تَشْرِيح بِى وِى بُاوْ شِى تُو يَعنى شرح مِعْدَه وَ طحال وَ بَيان مَنافذ كه دَرْ غشاءِ ايشَان اَسْت؛ فَصْلِ پِنْجُمْ دَرْ تشْرِيح لَمْ مَن سُوبى كُو فِن بِهِ تُو يعنى مِعَاءِ قولون و كيفِيَّت انقسَام بر از و بَول انجا و صُورتْ آن؛ فَصْلِ شَشُمْ از باب دُوَم دَرْ تَشْرِيح مِنكْ مُنْ دَاىْ حَنكْ سِيوْ حَنكْ بانكْ كوْانكْ تُو يَعنى بيان كيفِيَّت اتِّصَال عرُوق وَ مجَارىْ كلىْ بامِعَاءِ دِقاق وَ غلَاظ و مثَانه ابتدَا كرْدَه مِيگوُيند؛ (...) كُفتَارِ پِوُنْ ونْ خُوْانكْ دِىْ دَرْ مَغز سرْ صُوىْ يعنى مغز اينجا شَرحْ مُخ دِمَاغْ وَ غيْر آن خوَاهَد كردْ (...)."

Tānksūqnāme-i Īlkhān, Ayasofya 3596, pp. 115-139, 182-183; "Chap. 2: deals with the details concerning the inner organs and contains 15 sections. 1. section: the throat, the main organs, stomach, small intestine, large intestine and their illustrations. 2. section: the heart and passage and nature of the arteries. 3. section: the diaphragm and the passage of Qi there. 4. section: spleen and stomach and the quality of their passage and size. 5. section: large intestine and its excreta, urine and sweat, being divided and illustrated there (i.e. in the book). 6. section: the right kidney, small intestine, large intestine, urinary bladder and illustration. (...)" Klein-Franke and Ming, *ibid*, pp. 430-431.

31 *Tānksūqnāme-i Īlkhān*, Ayasofya 3596, pp. 182-183; "Chap. 3: deals with semen, Qi, brain, eat,

sections mentioned above were translated into English from Persian and then examined in this study. Information relevant to organs selected from sections of the work by the authors has been rearranged and presented under new headings for this article. The authors have also placed the detected Chinese equivalents of the Arabic and/or Persian anatomical and physiological terms in these chapters in square brackets at the relevant places in the text.

Results

The data in the 2nd section were taken from the book of Wang Shū Khū (وانكْ شُو خُو)[32] [王叔和 Wáng shū hé] and are on viscera (نُو كِنكْ تُو /Nū Ging Tū)[33] and consist of the discourses of Yen Lū Miz (يَنْ لُو مِزْ), one of the most preeminent physicians of Cathay (خَطای/Khaṭāy)[34].

The anatomical terms used in the text were both in Arabic and/or in Persian, and their equivalents in the Cathay language were written in Arabic letters. The data given under the title of anatomy (تشريح/*tashrīḥ*) indeed comprises both anatomical and physiological, sometimes even pathophysiological data.

Lungs including Bronchial tree/Trachea

"In the beginning, the True, may He be exalted (حَق تَعالَىٰ/Ḥaqq ta'ālā) created two paths, one is adjacent to *the neck bone* (عَظمْ عنق/*'aẓm-i 'unq*), they call it *yin* (يِنْ)[咽門 (yàn mén) the pharynx], as if the place where *yin* wants to reach is *mūy* (مُویْ)[35] [the esophagus]. The other is the one opposite *yin*, adjacent to the skin; they call it *khiyū* (خيُوْ) [喉 (hóu) the larynx]. He means that *khiyū* is *the trachea/bronchial tree* (قصَبةٌ ريَه /*qaṣaba'i riya*)"[36]. "This *khiyū* hangs on *the lung* (شُش-ريَه/*riya-shosh*) and is adjacent to it, and *the zephyr/breath* (نسيم/*nasīm*) reaches the lungs through this *khiyū*"[37]. "Others opposed Yen Lū Miz in their statements. One of them is that they

cold, air and dampness. This chapter contains 14 sections. (...) 8. Section: the functions of marrow in the head and elsewhere. (...)" Klein-Franke and Ming, *ibid*, p. 431.

32 "Wang[2] Shu[2]-ho[2] (12493, 10039, 3945). Flouirshed under the Western Chin[4] (2070) dynasty, 265 to 317. Chinese physician. Author of a celebrated treatise on the pulse Mo[4] Ching[1] (8011, 2122) in ten books." George Sarton, *Introduction to the History of Science,* Reprinted, Vol. I. The Williams & Wilkins Company, Baltimore 1953, p. 342.

33 possibly 內經圖 內景圖 [Nèijīng tú, nèijǐng tú] Inner Classics Map, Inner View Map (A/N).

34 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 115.

35 possibly "[مرى/marī]" (A/N).

36 *Tānksūqnāme-i Īlkhān*, Ayasofya 3596, p. 115.

37 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 116.

said that there are three pathways in the neck. One is the respiratory tract, one is the food path, and one is the waterway. Yen Lū Miz said that this has no basis and this statement is false"[38]. "He says that the bronchial tree excessively arborizes in the lungs and becomes one with this pathway and is connected to the heart so that through this way the zephyr of the lungs comes to the heart and the vital spirit from the heart to the lungs"[39]. "The lungs are *the servant* (خادم/*khādim*) of the heart. Cathay physicians called the lungs *shāng fū* (شٰانكْ فُو) [膳夫 (shàn fū) the lung]. *Shāng* (شٰانكْ) is the abbreviation for *ḥing shāng* (جِنكْ شٰانكْ)[40], i.e. *balance of justice* (عَدل ترازوی/*tarāzū-i ʿadl*) and *governor-general* (میرْ میرْان/*mīr-i mīrān*), *fū/fuww* (فُوّ) [肺 (fèi) the lung] i.e. *master/teacher* (استَاد/*ustād*). *Shāng fū* (شٰانكْ فُوّ) means *governor-general* and *master/teacher*[41]. "There are no *passages* (منفذ/*manfadh*) beneath the lungs. Passages are in the middle of the lungs and are settled between the heart and the lungs. Wisdom of the True, may He be exalted and be accounted holy (حَق تعَالَی و تَقَدّسَ/Ḥaqq taʿālā wa taqaddasa), requires that the lungs to be under and around of these passages, and have lobes around of them so that the breath to be near to the moderation when it reaches that pathway; then it goes to the heart. The breath, which is out of moderation, is in the lower lobes of the lungs. The rest of it goes around the lungs so that it increases the power there and sends the breath, which is rough and turbid, to beneath and around the lungs and the breath, which is pure and moderate, to the heart. When the breath is exhaled, lobes and the environment of the lungs collapse quickly. It sends the smoky spirit, which is turbid and rough, out quickly"[42]. "The function of the lungs is that always to be the zephyr/breath directed to the heart so that moderation of the heart remains (Figure 2a-b)"[43].

Heart

"*The heart* (دل ـ قلب/*dil-qalb*) [سِمْ/*sim*] [ٰشِن (xīn) the heart] is *the chief organ* (عُضو رَئيس/*ʿuḍw-i raʾīs*) and is like a *monarch/king* (پادشاخ/*pād-shāh*)"[44]. "Their beliefs are that the heart may be small in some people or big, and bent in someone or straight. There is an opening in *the auricles of the heart* (دِلْ كوشهَاءِ/*gūshhāʾ-i dil*) in some people or not. That is to say, the heart is sometimes located in a natural position, sometimes

38 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 123.

39 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 127.

40 possibly 衡膳 [Heng shan] (A/N).

41 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 117.

42 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 116.

43 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 117.

44 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 117.

unnatural. Diseases are less in the heart but more in *the pericardium* (غلاف دل/*ghilāf-i dil*). There is a space between the pericardium and the heart, but the pericardium is in contact with *the lungs* (ریه/*riya*)"[45].

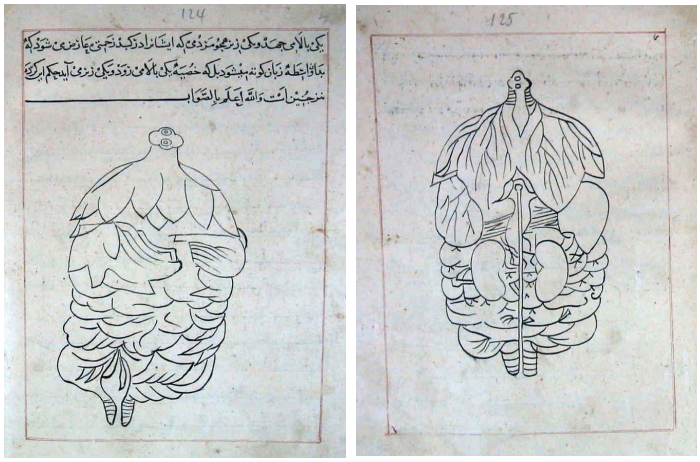

Figure 2 a, b: The illustrations at the end of the first section [The first section of the second chapter. From the speeches of Yen Lū Miz, who is one of the most virtuous physicians of Cathay (فَصلِ اوَّل از بَاب دُوّم دَرْ سخنان يَنْ لُو مِزْ كه افضَال حكماءِ خطای بُودَهْ اَسْت)] of the second chapter [The second chapter from Wang Shū Khū's book. On *Nū Ging Tū*,[46] i.e., the explanation of the internal organs, and they call it *Giwan Dī Didd*,[47] i.e. the second chapter, and it contains sixteen sections (بَابُ دُوُم از كتَاب وانكْ شُو خُوْ دَرْ نُو كِنكْ تُو يَعنِى دَرْ شَرْح اَعضَاءِ اندَرُونى وَ اين بَابْ را ايشان كِوَنْ دِى دِّد يَعنِى قِسْم دُوّم وَ اين مُشتَمل اسْت بَرْ شانَزده فَصل)] of *Tānksūqnāme-i Īlkhān Der Funūn-i 'Ulūm-i Khaṭā'ī* (Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

"When the blood is born into the liver and fully matures, a vapor is born into the heart. It grows up there and becomes a vital spirit. When the zephyr/breath is inhaled into the lungs, and goes to the heart, this zephyr gives birth to that spirit. The heart sends it to all organs and extremities of the body in this pathway [i.e., the artery] and softens all bones with this spirit. When this vital spirit is in balance, it is good. Temperament does not change and remains in an equable state. The organs get into safety. When this spirit weakens, its temperament alters and damages all organs by this means"[48].

45 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 122.

46 possibly 內經圖 內景圖 [Nèijīng tú, nèijǐng tú] Inner Classics Map, Inner View Map (A/N).

47 possibly 卷第二 [Juǎn dì èr] Volume 2 (A/N).

48 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 126.

"Three *arteries* (شریان/*shiryān*) from the heart go to the lungs, and through that, one of them ascends to *the throat* (حلق/*ḥalq*) and two others, each one turns towards each side, one of them is to the right, and one of them branches out in the lungs and then penetrates the lungs, reaches the thoracic vertebrae, and descends to the kidneys. After reaching two kidneys, it goes to *the bladder* (مثانه/*mathāna*) and spreads in the organs next to the bladder (Figure 3)"[49].

Figure 3: The illustration at the end of the second section of the second chapter [The second section of the second chapter. On the dissection of the heart and vessels and the nature of each vessel in it, and they call this part *sīm*[50] *mā*[51] *tū*[52,53] (فَصلْ دُوُم از بَاب دوُم دَرْ تشریح قَلْب وَ شرْیَانَات اوو کیفیَّت ممَرْ هَرْ عرقی اَز اوُ وَ این فَصلْ را سِمْ می تُو میگوُیند)] of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī*

(Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

Diaphragm

"There is a *curtain/membrane* (حجَاب/*ḥijāb*) [كِك مُو/*gig mū*] [隔膜 (gé mó) the diaphragm] beneath the heart that begins from *the xiphoid process of the sternum* (غضْرُوف خنجَری/*ġuḍrūf-i khanjarī*) and *the false ribs* (ضلُوع خلف/*ḍulūʿ-i khilf*), and it adheres to the end of *the vertebrae of the back* (خَرزات ظَهْر/*kharazāt-i ẓahr*) and becomes a *separator* (حَاجزْ/*ḥāciz*) between the heart and the lower viscera i.e., *the intestines* (امعاء/*amʿāʾ*)"[54]. "The diaphragm

49 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 126-127.

50 心 [Xīn] the heart.

51 脉 [Mài] the artery.

52 圖 [Tú] figure.

53 心 脉 圖

54 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 116-117.

is one of the friends of the lung and functions as nearly as the lung does"[55]. "The diaphragm prevents arriving of thick vapors and disgusting extraction from the intestine to the heart. Our [Persian] physicians call these two organs, i.e. the lungs and the diaphragm, as *the preparatory servants* (خادِم مهيّى/*khādim-i muhayyī*)"[56]. "There is a passage in the diaphragm named as *tānjū/tān jū* (تَانْجُو/تَنْ جُو) [三焦 (sānjiāo)] that is the pathway through which *yim* (يِمْ) [陰 (yīn)] and *the vital spirit* (رُوح حيوَانى/*rūḥ-i ḥayawānī*) flow from the heart to the lower viscera. Whenever there is an obstruction in this way, the animal spirit cannot pass towards the lower viscera, and the damage emerges. Whenever *tānjū* weakens, it cannot block the disgusting extraction reaching the heart, and the damage occurs. Whenever this pathway is in its own rule, the temperament of a person becomes the best of his own. According to Cathay physicians, *the reflective faculty* (قوّه مُتفكّره/*quwwa-i mutafakkira*) is in this *tānjū,* and other ones originate from it. The cheerfulness belongs to it (Figure 4)"[57].

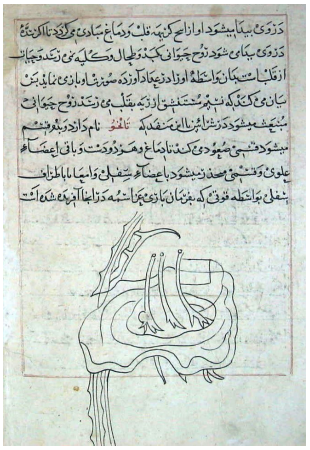

Figure 4: The illustration at the end of the third section of the second chapter [The third section. On the dissection of *kī khay*[58] *gig mū*[59] *tū*[60,61] i.e., it tells the explanation of the diaphragm and the form of the breath passing through it (فَصْلِ سِوُّمْ دَرْ تَشْرِيح كِى خَىْ كِكْ مُو تُو يَعنى شرح حجاب وَ صُورتْ مرورْ نفسْ دَرْ او مِيْگويدْ)] of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī*
(Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

55 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 117.

56 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 117.

57 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 129.

58 氣海 [Qì hǎi] the lung, the ocean of Qi/air.

59 膈膜 [Gé mó] the diaphragm.

60 圖 [Tú] figure.

61 氣海 膈膜 圖

Liver

"*The liver* (جگر- کبد /*jigar-kabid*) is under the diaphragm and on the right side"[62]. Their beliefs are that the liver is in one piece, i.e., there are lobes on it, and it is in two parts, i.e., a lobe is from itself, and it is in three parts, i.e., two lobes are from itself"[63]. "The liver is the servant of the heart. *A blood vessel* (عرق / *ʿirq*) arises from *the convexity of the liver* (محدب کَبِدْ / *muḥaddab-i kabid*) and spreads out in the diaphragm and branches off from there to the pericardium and *the pleura* (غشَاءِ رِيَه / *ghişāʾi riya*) and reaches the heart, and Allāh knows the truth"[64]. "When the meal is eaten, it becomes *the chyle* (کیلُوس/ *kaylūs*) and goes to the liver from *the stomach* (معْدَه / *miʿda*). They call that pathway *bun mun* (بُنْ مُنْ) [賁門 (bēnmén) the cardia], and our [Persian] physicians name it *the lacteals* (مَاسَارِيقا / *māsārīqā*). That chyle becomes blood in the liver and goes to all members of the body from there"[65]. "Our [Persian] physicians compare the liver with *the preparatory servants* (*khādim-i muhayyīʾ*) [the lung and the diaphragm] and say that it is *birth of the spirit* (تولید روح / *tawlīd-i rūh*). Cathay physicians call the liver *J̌āng Shū* (جَانكْ شُو) [(جَانكْ) 肝(gān) the liver], i.e., *the possessor of council* (صَاحِبْ ديوَان / *ṣāḥib-i dīwān*), in that respect, nourishment of all body members comes from the liver, and it is the administrator of all members of the body. They say that the origin of the heart is the liver. Their purpose is that the origin of the vital spirit is the heart and its origin is the liver, i.e., the origin and source of the natural spirit is the liver. When the natural spirit arrives at the heart, it becomes the vital spirit and gives the vital power. In fact the vital power of all members [of the body] is in the liver, but life is in the heart, and it gives [life]"[66].

Gallbladder

"*The gallbladder* (مَراره / *marāra*) is on the liver and the right side. There is a pathway from the gallbladder to the liver. Benefits of the gallbladder are; whenever the heat of the gallbladder spreads to the liver, the moist vapor reaches the brain from the liver; therefore it enhances sleep. When the gallbladder's heat does not reach the liver or the gallbladder is cold, the moist vapor is far from the brain, and insomnia occurs. The cause of the wrath is from the gallbladder. When the heat of the gallbladder rises, and the blood boils, therefore the heat occurs in the body, it does

62 *Tānksūqnāme-i Īlkhān*, Ayasofya 3596, p. 118.

63 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 122.

64 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 127.

65 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 120.

66 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 118.

not quickly decrease, and the power of the wrath increases. Courage is from the gallbladder"[67].

Esophagus and Stomach

"They call *the esophagus* (مُوی/*mūy*)[68] as *bin* (بِنْ) in Cathay. The esophagus is the way which the foods and beverages transit and go down to the stomach. It is *the first part of the stomach* (اوَّل مِعْدَه/*awwal-i miʿda*)"[69]. "*The stomach* [وِیْ/*wī*] [胃 (wèi) the stomach] is like a marketplace in the human body; for this reason, whatever is eaten and drunk is collected there and is distributed from there. Five passages are in the stomach. One of them is *the cardia* (فم مِعْدَه/*fam-i miʿda*)"[70]. "The other one is an opening in *the bottom of the stomach* (قعرْ مِعدَه/*qaʿr-i miʿda*) which is *the collector of sediment/turbid liquid* (جمر ثفل/*jamr-i thifl*) that the physicians call it *the pylorus* (بوّاب/*bawwāb*) and *the orifice of the duodenum* (فم اثنا عشری/*fam-i ithnā-i ʿasharī*) and Cathay physicians call it *yū mūn* (یُو مُن) [幽門(yōu mén) the pylorus]"[71]. "Another goes to *bū min* (بُو مِن) [脾門(pí mén) hilus lienis; porta lienis], and the other one to *lemmūn*/*lem mun* (لَمْمُونْ/لَمْ مُنْ) [闌門(lán mén) the ileocecal conjunction]"[72].

Spleen

"*The spleen* (طِحال/*ṭiḥāl*) [بِی/bī] [脾 (pí) the spleen] is placed outside of the stomach and is adjacent to the stomach [بی وِیْ بَاوْ شی/*bī wī bāw shī*] [脾胃包系 (pí wèi bāo xì) spleen and stomach system]. A pathway/an artery, which is separated into two branches, emerges from the spleen. One of the branches ascends *to the cardia,* [which is in front of the false ribs and then penetrates the diaphragm][73] then accompanies another way in front of the integument that our [Persian] physicians call it as *the mediastinum* (غشاءِ مُنصّف/*ghishāʾ-i munaṣṣif*) so that it divides *the chest* (صَدْر/*ṣadr*) and joins to the lung and then reaches the heart. The origin of the pathway, which rises from the stomach, is the place where Cathay physicians call it as *yun yun* (یُنْ یُنْ). The other one descends to *the pylorus* that Cathay physicians call it *yū*

67 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 120.

68 possibly "[مری/marī]" (A/N).

69 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 119.

70 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 131.

71 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 120-121.

72 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 132.

73 *Tānksūqnāme-i Īlkhān*, Ayasofya 3596, p. 127.

mun (يُو من)"[74]. "Food reaches the cardia from the spleen and unites with the lung from the cardia. Whenever hot weather comes into the lungs, through it, the heat of the heart increases, and the cold is absorbed from the spleen with the command of the True, may He be exalted and be accounted holy (حَق تعَالَى وَ تقدَّسَ/Ḥaqq ta'ālā wa taqaddasa), and it comes to the lungs. That cold reduces the heat so that the heart does not get harm. Appetite/desire for food appears through the other vessel joining to the pylorus from the spleen (Figure 5)"[75].

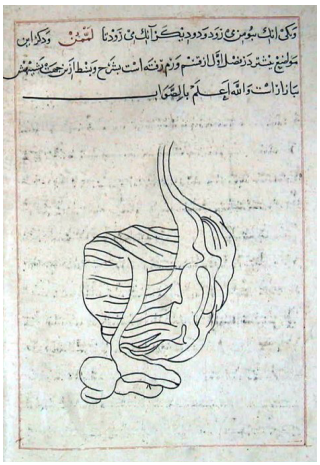

Figure 5: The illustration at the end of the fourth section of the second chapter [The fourth section. On the dissection of *bī*[76] *wī*[77] *bāw yī*[78] *tū*[79,80] i.e., the statement of the stomach and spleen and the passages in their membranes (فَصْلِ چَهارُمْ دَرْ تَشْرِيح بِى وِى بٰاوْ شِى تُو يَعنى شرح مِعْدَه وَ طحال وَ بَيان مَنافذ كه دَرْ غشاءِ ايشْان اَسْت)] of *Tānksūqnāme-i Īlkhān Der Funūn-i 'Ulūm-i Khaṭā'ī* (Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

Small Intestine and Large Intestine

"Cathay physicians call *the small intestine siyū ḥang* (سِيوْ حَنگْ) [小肠 (xiǎo cháng) the small intestine]"[81]. "*Lem mun* (لَمْ مُن) [闌門 (lán mén) the gate/the ileocecal valve] is

74 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 131.

75 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 119-120.

76 脾 [Pí] the spleen.

77 胃 [Wèi] the stomach.

78 脾胃包系 [Píwèi bāo xì] the spleen and stomach system.

79 圖 [Tú] figure.

80 脾胃包系 圖

81 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 121.

the joint of the small intestine and *the large intestine* (امعَاءِ غلَاظ/*am'ā'-i ghilāẓ*). There are three passages. One is where the liquid separates and goes to the bladder. The other one is where the sediment goes to *the colon* (قُولُونْ/*qūlūn*) and *the rectum* (مِعَاءِ مُسْتَقِيمْ/*mi'ā'-i mustaqīm*). Another one is where the sediment and the liquid pass through. They believe that chyle goes to the liver, and the rest passes through the duodenum and *the small intestine* (مِعَاءِ دقَاق/*mi'ā'-i diqāq*) until it arrives at the place, where they call *lem mun* and stops there. Then the liquid separates from the sediment and goes to the bladder, and the excrement goes to the rectum. They also believe that the bottom of the stomach is adjacent to the bladder, i.e., is above the bladder. They say whenever these passages weaken, either *incontinence of urine* (سلِس البَول/*salis al-bawl*), or *diarrhea* (اسْهَال/*ishāl*) or both of them occur. Whenever an obstruction occurs there, it causes *difficulty of passing urine* (عَسْر البَول/*'asr al-bawl*) or *colic* (قُولنج/*qūlunj*), and Allāh knows the truth"[82]. "They call *the rectum dāy ḥang* [大肠 (dà cháng) the large intestine]. Excrement (ثفل - براز/*thifl-barāz*) is expelled via *dāy ḥang*"[83].

Bladder

"They say when the fluids come to *the bladder* (مَثانَه/*mathāna*) [膀胱 (páng guāng) the bladder]; if the bladder is empty, *urine* (بَول/*bawl*) is not excreted. If the bladder is full, urine asks for permission to go out. If the warmth overmatches in the bladder, *difficulty in passing urine* (عسْر بَول/*'asr-i bawl*) occurs. If the coldness overmatches, it causes excessive urine excretion (Figure 6)"[84]**.**

Kidneys

"There are two *kidneys* (كُلِيَه/*kulya*) [شِنْ/*shin*] [腎(shen) the kidney]. One is on the right side, the other is on the left. They call the kidney on the right side as *ming mun* (مِنكْ مُن), i.e. *the origin of human* [命門 (mìng mén) life-gate/the right kidney]. Its temperament is fire, i.e., hot and dry. The name of the kidney on the left side is *shin mun* (شِنْ مُن) [腎門 (shèn mén) the left kidney]. Its temperament is water, i.e., cold and wet. The color of kidney is bright red and it is adjacent to the waist. The fat surrounds the kidney. The inside of the kidney is white, the outside is prone to redness. A vessel rises from each of them and joins the liver and goes from the liver to the heart. Place of the kidney is opposite of the umbilicus"[85]. "Permanence of all existent things is from heat and coldness, and since the permanence of human

82 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 133.

83 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 121.

84 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 121-122.

85 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 122-123.

also is from the same quality, so the wisdom of God, may He be exalted (الله تَعَالَىٰ / Allāh ta'ālā), is that one of them should be similar to the nature of water and the other should be similar to the nature of fire"[86].

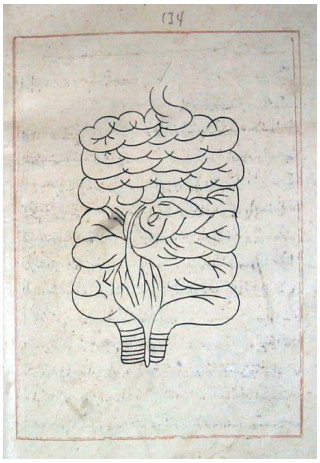

Figure 6: The illustration at the end of the fifth section of the second chapter [The fifth section. On the dissection of *lem men*[87] *sūbī*[88] *gū fin*[89] *bihū*[90] *tū*[91,92] i.e., the colon and the qualities of the stool and urine parts there and their description (فَصْلِ پَنْجُمْ دَرْ تشْرِيح لَمْ مَن سُوبى كُو فِن بِهِ تُو يعنى مِعَاءِ قولون و كيفِيَّت انقسَام براز و بَول انجا و صُورتْ آن)] of the *Tānksūqnāme-i Īlkhān Der Funūn-i 'Ulūm-i Khaṭā'ī* (Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

"The other reason is that since the heart is on the left side, and the heat of the heart and other members of the body is high, the left kidney is cold and wet like the nature of water. If the nature of this kidney could be fire, its heat could increase with the heat of the heart, the heat could boil, and dryness could appear, so the wisdom of the Most Holy and High (سُبْحَانهُ وَ تعَالىٰ/Subḥānahu wa ta'ālā) necessitates that this kidney should be cold and its coolness causes the moderateness of the heart"[93]. "And again, the kidney on the right, which they call

86 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 135.

87 闌門[Lán mén] gate/ileocecal conjunction.

88 小便 [Xiǎobiàn] urinate.

89 除糞 [Chú fèn] defecation.

90 排泄 [Páixiè] excretion.

91 圖 [Tú] figure.

92 小便 除糞 排泄 圖

93 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 136.

ming mun, and a vessel descends from there, where *the semen* (مَنِیْ/*manī*) is expelled through *the vesiculae seminalis* (اوعِیَهٔ مَنِی/*awʿiyya'-i manī*), when the men and women come together, the semen comes out from here, and is collected in *the uterus* (رَحْم / *raḥm*), where is the birthplace of *the fetus* (جَنِین/*janīn*)"[94]. "Others have said that the right kidney is lower than the left kidney, the left kidney is higher than the right kidney. This sect is compatible with our *Māchakmā'* (ماچکماء) sect, and he said that this sect has no origin, although I [Yen Lū Miz] see that one kidney is below and one is above in those who were executed. There is a reason for this, and this is because, at the time of execution, the blood of one kidney leaps up, the other's down, as people with a liver ailment. By this means, the tongue is shortened, perhaps characteristically, one kidney goes up, other one comes down. The verdict is that the kidney is like that. Allāh knows the truth"[95].

Vessels

"*The thin vessels* (عروق دقاق / *ʿurūq-i diqāq*), which are from the heart and the liver, reach the small intestine. The vessels, which originate from the heart, go to the lungs, and the liver, and then to the large intestine. Each vessel, which reaches the small and large intestine and the kidneys from the heart and the liver, leans upon vertebrae of the back entirely and unites with it"[96].

Uterus and Uterine Tubes

"*The uterus* (رَحْم /*raḥm*) is on the right side, and under its two *horns* (شِی حَنكْ/*shi hang*) [子房 (zǐ fáng) the uterine tubes]. The uterus reaches underneath the bladder and passes opposing to it, and *the neck of the uterus* (عنق رحم / *ʿunq-i raḥm*) emerges that they call *the vagina* (فرج /*farj*) (Figure 6)"[97].

Brain and Spinal Cord

"He will explain *ṣūy* (صُوىْ) [髓(suǐ) marrow], i.e. *the brain* (مَغز-دمَاغ/*maghz-dimāgh*) and *the marrow* (مُخ/*mukhkh*). He says that the marrow is from the brain, in that respect it is the sea of marrow, and *the spinal cord* (نخَاع/*nukhāʿ*) arises from the marrow of the brain and descends in *the vertebrae of the back* (فقرَات ظَهْر/*fiqārāt-i ẓahr*) until *the coccygeal vertebrae* (فقَار عصعص/*fiqār-i ʿuṣʿuṣ*). *Nerves* (أعصَاب/*aʿṣāb*) emerge

94 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 123.

95 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 123-124.

96 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 138.

97 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, p. 137.

from the brain, and the spinal cord, and spread to the entire body. The origin of *the animal spirit* (رُوح نَفْسَانی/*rūḥ-i nafsānī*) is the vapor that skips from the blood and the spirit, which is in the heart and the liver. That vapor reaches the brain and becomes the animal spirit. The spirit of the brain grows and spreads from here to different parts of the whole body. Whenever the quantity of the blood in the body is little, generation of this spirit is little too; therefore, the power of sense and movement becomes deficient"[98].

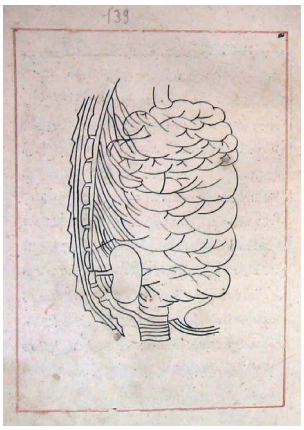

Figure 7: The illustration at the end of the sixth section of the second chapter [The sixth section of the second chapter. On the dissection of *ming mun*[99] *dāy hang*[100] *siyū hang*[101] *bāng guwang*[102] *tū*[103,104] i.e., the statement of the qualities of the connection of renal vessels and pathways with the small intestine, large intestine, and bladder (فَصْلِ شَشُمْ از باب دُوّم دَرْ تَشْرِيح مِنكْ مُنْ دَایْ حَنكْ سِيوْ حَنكْ بانكْ كوْانكْ تُو يَعنی بيان كيفِيَّت اتّصَال عرُوق وَ مجَاریْ كلیْ بامِعَاءِ دِقاق وَ غلَاظ و مثَانه ابتدَا كرْدَه ميگوْيند)] of *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī*

(Courtesy of Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul, Türkiye).

Discussion and Conclusion

Five *noble organs*, i.e., the heart, the lungs, the spleen, the liver, and the kidney, called as *ʿuḍw-i sharīf* (عضْو شرِيف) in the text,[105] are the "*zang* viscera" in Chinese

98 *Tānksūqnāme-i Īlkhān,* Ayasofya 3596, pp. 182-183.

99 命門[Mìng mén] life-gate.

100 大肠 [Dà cháng] the large intestine.

101 小肠 [Xiǎo cháng] the small intestine.

102 膀胱 [Páng guāng] the bladder.

103 圖 [Tú] figure.

104 命門 大肠小肠 膀胱 圖

105 "There are five *noble organs* (عضْو شرِيف/*ʿuḍw-i sharīf*) in the human body, and these five organs

medicine (CM)[106]. The other organs, i.e., the stomach, the small intestine, the large intestine, the gallbladder, and the bladder, are "*fu* viscera" of Chinese medicine (Table 1)[107]. The sixth *fu* viscera sanjiao – the collective term for the upper, middle, and lower-jiao – is located in the chest and abdomen[108]. Genuine Qi, which is the driving force of the vital activities of the human body, is located in the lower-jiao and originates from the kidney, uses the sanjiao path, and attains the whole body[109]. The sanjiao of Chinese Medicine is mentioned as *tānjū* (تانجو)/[*thānjū* [ثانجو] in the *Tānksūqnāme-i Īlkhān*, where *the tānjū* is described as a pathway through which *yin* [阴 (yīn)] and *the vital spirit/pneuma* (روح حيواني/*rūḥ-i ḥayawānī*) pass.

Table 1: Zang and Fu viscera in Chinese medicine.

Zang viscera in CM [ʿUḍw-i sharīf]		**Fu viscera in CM**	
The heart	Dil[P]/Qalb[A]	The small intestine	Aʿmāʾ-i daqīq
The lungs	Shosh[P]/Riʾa[A]	The large intestine/The colon	Aʿmāʾ-i ghilāẓ /Maʿāʾ-i qūlūn
The spleen	Ṭiḥāl[A]	The stomach	Miʿda
The liver	Jigar[P]/Kabid[A]	The gallbladder	Marāra
The kidneys	Kulya[A]	The bladder	Mathāna

According to Chinese medicine, mental, conscious, and thinking activities are associated with the heart and the liver. The heart hosts the mind and controls mental activity, while the liver regulates emotions[110]. Blood production and circulation are among the functions of the spleen and heart[111]. The heart controls the blood vessels,

become *wū sāng* (وُوسانك) [五脏(wǔ zàng)] in man, and these five are the heart, liver, lung, spleen, and kidney. Of these five organs, four are single, and one is two. The kidney is double, that is, two. What is the reason? Its answer is that *the semen* (مَنِی/*manī*) is collected in it [the kidney] from all the organs. After that, it goes to *the vesiculae seminalis* (اوعِیَهُ مَنِی /*awʿiyya'-i manī*)." *Ibid*, p. 135.

106 Zhanwen Liu (ed) and Liang Liu (ass. ed), *Essentials of Chinese Medicine*, Volume 1 Foundations of Chinese Medicine, Springer-Verlag, London 2009, p. 51.

107 *Essentials of Chinese Medicine*, p. 78.

108 *Essentials of Chinese Medicine*, p. 84.

109 *Essentials of Chinese Medicine*, p. 85-86.

110 *Essentials of Chinese Medicine*, pp. 92-93.

111 *Essentials of Chinese Medicine*, p. 90.

through which Qi and blood flow, [112] while the spleen checks transport and blood flow[113]. Digesting food and drink, converting them into nutrients, and absorbing and delivering the essential nutrients to the whole body are among the functions of the spleen[114]. The main organ for the storage of blood is the liver.[115] The brain, the marrow, the vessels and the uterus are irregular organs which are different from *zang* and *fu* organs[116].

Three organs, the brain, the heart, and the liver, are *the chief (the principal or vital) organs* (اعضاء رئيسة/*aʿḍāʾ-i raʾīsa*) of the medical paradigm in Islamic geography in the Middle Ages inherited from the Greco-Roman world. The nerves, arteries, and veins are *the servant (auxiliary) organs* (اعضاء خادمة/*aʿḍāʾ-i khādima*) of the brain, the heart, and the liver, respectively (Table 2)[117]. *The natural spirit/pneuma* (روح طبيعي/*rūḥ-i ṭabīʿī*) originates in the liver, *the vital spirit/pneuma* (روح حيواني/*rūḥ-i ḥayawānī*) in the heart, and *the animal spirit/pneuma* (روح نفساني/*rūḥ-i nafsānī*) in the brain, and these *spirits/pneumas* are distributed via the veins, arteries, and nerves, respectively[118].

Table 2: The chief organs and their servants, and the spirits of the medical paradigm in Islamic world during the Middle Ages.

The chief organs (Aʿḍāʾ-i raʾīsa)		**The servant organs (Aʿḍāʾ-i khādima)**		**The spirits (Rūḥ/ arwāḥ)**	
The brain	Maghz[P]/Dimāgh[A]	The nerves	ʿAṣab /aʿṣāb	The animal spirit	Rūḥ-i nafsānī
The heart	Dil[P]/Qalb[A]	The arteries	Shiryān / sharāyīn	The vital spirit	Rūḥ-i ḥayawānī
The liver	Jigar[P]/Kabid[A]	The veins	ʿIrq /ʿurūq	The natural spirit	Rūḥ-i ṭabīʿī

112 *Essentials of Chinese Medicine,* pp. 54, 90.

113 *Essentials of Chinese Medicine,* p. 90.

114 *Essentials of Chinese Medicine,* p. 60.

115 *Essentials of Chinese Medicine,* p. 64.

116 *Essentials of Chinese Medicine,* p. 87.

117 Avicenna and Oskar Cameron Gruner, *A Treatise on the Canon of Medicine of Avicenna,* Incorporating a Translation of the First Book. Oskar Cameron Gruner (tr.). Reprinted from the edition of 1930, London. First AMS edition published in 1973. AMS Press Inc., New York, N.Y. 1973, pp. 97-98.

118 Peter E. Pormann and Emilie Savage-Smith, *Medieval Islamic Medicine*. Edinburgh University Press, Edinburgh 2007, p. 45.

According to humoral theory, the heart is the location of the vital faculty/power, or innate heat, while the brain is the center of the mental faculties, sensation, and movement. The liver is the base of the nutritive or vegetative faculties[119] and blood production. When the food is cooked in the stomach, it passes into the duodenum and then into the small intestine. There the veins absorb the chyle and transport it through the portal vein into the liver, where it is converted into blood, and then the blood is sent to the entire body through the vena cava[120].

Digestion and blood production functions of the spleen in Chinese medicine were ignored, and the spleen was replaced by the liver in the *Tānksūqnāme-i Īlkhān*. The vital spirit/the spirits (the natural, vital, and animal) of humoral theory were used instead of *Qi* in the *Tānksūqnāme-i Īlkhān*. Explanations on the brain and spinal cord seem to be taken from the humoral theory.

As Ünver[121] pointed out, the book's translator knew well the principles of medicine inherited from the Greco-Roman world and improved in Islamic geography during the Middle Ages. This study shows us that while the translator of the book was trying to translate the text, he also tried to accommodate/synthesize the anatomical knowledge of these two medical paradigms in the *Tānksūqnāme-i Īlkhān*.

On the other hand, the original spelling and meanings of most of the Chinese words written in Arabic letters in the examined sections of the *Tānksūqnāme-i Īlkhān* have been added to the text. In this context, it seems possible to say that our study answered the question Ünver asked during a comment he made in 1939[122].

119 Gruner, *ibid.*, p. 98.

120 Pormann and Savage-Smith, ibid., pp. 45-46; Manfred Ullmann, *Islamic Medicine*, Edinburgh University Press, Edinburgh 1978, p. 64.

121 Ünver, *Tanksukname Mukaddimesi*, p. 10.

122 "Eserde Çince isimlerin Arab harflerile yazılması eserin Çince yazılmış menbalardan istifadesini gösterir. Bu ehemmiyetlidir. Bu kelimeler Çince ve yahut telaffuz olunduğu lisanların alfabesile yazılsaydı daha çok mühim olurdu. Bu kelimelerin bu harflerle yazılışı Çinceye vukufu olan birisine okunacak olursa bir mana verilebilirmi ve yahut anlayabilir mi bilmem. Fakat bunu yeniden tamika lüzum yoktur. Bugün bu kelimelerin yanlarında farsçaları konmuştur. Manasını farsçadan türkçeye çevirmekle anlıyabiliyoruz. *[The fact that the Chinese names are written in Arabic letters in the work indicates that the work benefits from the sources written in Chinese. This is important. It would be more important if these words were written in Chinese or the alphabet of the languages in which they are pronounced. If the writing of these words in these letters is read to someone who knows Chinese, can meaning be given or understand, I do not know. But there is no need to re-investigate this. Today, Persian words are put next to these words. We can understand its meaning by translating it from Persian to Turkish.]*" Ünver, *ibid*, p. 17.

BIBLIOGRAPHY

[Adıvar], Abdulhak Adnan, "Sur le Tanksukname-I-Ilhani der Ulum-U-Funun-I-Khatai", *Isis*, XXXII/1, 1940, pp. 44-47.

Avicenna - Gruner, Oskar Cameron, *A Treatise on the Canon of Medicine of Avicenna,* Incorporating a Translation of the First Book. Gruner, Oskar Cameron (tr.). Reprinted from the edition of 1930, London. First AMS edition published in 1973. AMS Press Inc., New York, N.Y. 1973.

Berlekamp, Persis, "The Limits of Artistic Exchange in Fourteenth-Century Tabriz: The Paradox of Rashid al-Din's Book on Chinese Medicine, Part I", *Muqarnas: An Annual on the Visual Culture of the Islamic World*, XXVII, 2010, pp. 209-250.

Huard, Pierre, "A Propos du Tenk Suk Name (Tenksuq-nameh)", *Méridiens: Revue de l'Association Scientifique des Médecins Acupuncteurs,* 37-38, 1977, pp. 11-16.

Klein-Franke, Felix - Ming, Zu, "Rashīd ad-Dīn as a Transmitter of Chinese Medicine to the West", *Le Muséon*, CIX/3 (1996), pp. 395-404.

Klein-Franke, Felix - Ming, Zu, "Rashid ad-Din and the Tansuqnamah: the Earliest Translation of Chinese Medical Literature in the West," *Le Muséon* CXI/3-4, 1998: p. 427-445.

Miyasita, Saburō, "A Link in the Westward Transmission of Chinese Anatomy in the Later Middle Ages", *Isis*, LVIII/4, 1967, pp. 486-490.

Pormann, Peter E. - Savage-Smith, Emily, *Medieval Islamic Medicine.* Edinburgh University Press, Edinburgh 2007.

[Rashīd al-Dīn], *Tānksūqnāme-i Īlkhān Der Funūn-i ʿUlūm-i Khaṭāʾī*, Türkiye Yazma Eserler Kurumu Başkanlığı, İstanbul Süleymaniye Manuscript Library, Ayasofya Collection, Nr. 3596, Tabrīz 1313.

Sarton, George, *Introduction to the History of Science,* Reprinted, Vol. I. The Williams & Wilkins Company, Baltimore 1953.

Ullmann, Manfred, *Islamic Medicine,* Edinburgh University Press, Edinburgh 1978.

Ünver, A. Süheyl, *Tanksuknamei İlhan der Fûnunu Ulûmu Hatai Mukaddimesi*, transl. Baki Gölpınarlı, İstanbul Üniversitesi Tıp Tarihi Enstitüsü, İstanbul 1939.

Ünver, A. Süheyl, "Recent Researches on the Wang Shu Ho Text", *İstanbul Üniversitesi Tıb Fakültesi Mecmuası*, VII/2, 1944, pp. 3874-3876.

Liu, Zhanwen (ed.) - Liu, Liang (assoc. ed.), *Essentials of Chinese Medicine,* Volume 1, Foundations of Chinese Medicine, Springer-Verlag, London 2009.