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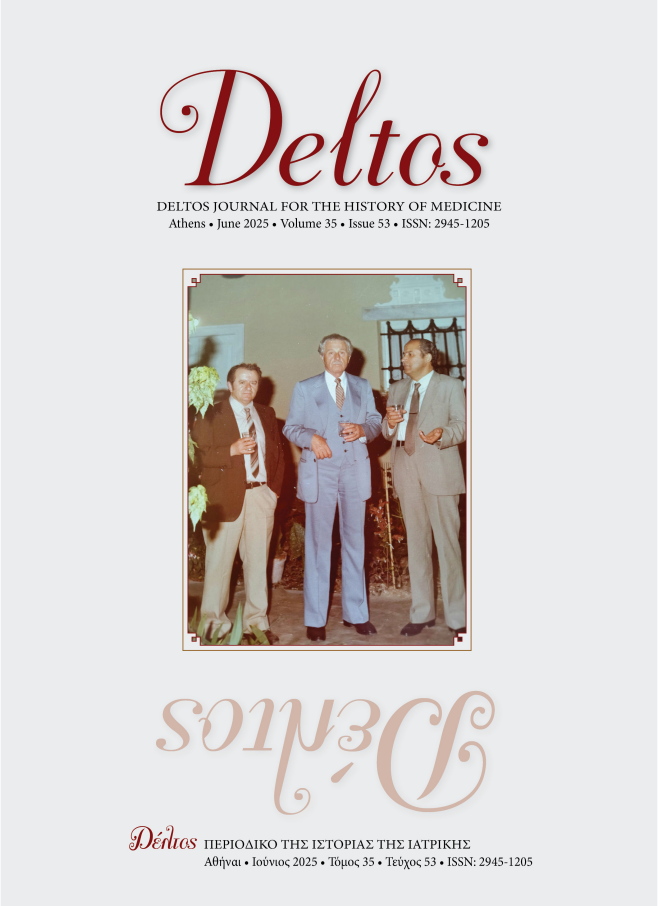

Full issue

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Deltos

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Δέλτος

Δέλτος ΠΕΡΙΟΔΙΚΟ ΤΗΣ ΙΣΤΟΡΙΑΣ ΤΗΣ ΙΑΤΡΙΚΗΣ
Αθήναι • Ιούνιος 2025 • Τόμος 35 • Τεύχος 53 • ISSN: 2945-1205

Η εκτύπωση του παρόντος τεύχους κατέστη δυνατή
με την επιχορήγηση του Ιατρικού Συλλόγου Αθηνών

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with a grant by the Medical College of Athens.

Ανακοίνωση του Ἱδρύματος Ν.Κ. Λοῦρος

Δωρεάν διαμονή προσφέρεται για περιορισμένο χρονικό διάστημα στους ερευνητές της Ιστορίας της Ιατρικής στους χώρους του Ιδρύματος στο κέντρο της Αθήνας.
Για λεπτομέρειες απευθυνθείτε στον Πρόεδρο του Ιδρύματος: Καθηγητή Κώστα Τρομπούκη,
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Announcement by the Louros Foundation

Free accommodation is offered for limited periods to researchers in the History of Medicine at the Foundation's Head Quarters in the center of Athens. For details write to the Foundation's President: Prof. Costas Trompoukis, e-mail: trompoukis@yahoo.gr

Εικόνα Εξωφύλλου:

Οι αείμνηστοι καθηγητές Αντώνης Μπίλης, Γεώργιος Δάϊκος και Νίκος Παπαδογιαννάκης φωτογραφήθηκαν σε κοινωνική εκδήλωση κατά τη διάρκεια του 3ου Πανελλήνιου Συνεδρίου Νεφρολογίας, που πραγματοποιήθηκε στην Πάτρα, 17-19 Μαΐου 1984. Και οι τρεις ήταν μέντορες δεκάδων Ελλήνων νεφρολόγων, συμπεριλαμβανομένου και του εκδότη του Deltos. Η Συντακτική Επιτροπή του περιοδικού εκφράζει τα θερμά της συλλυπητήρια για τον πρόσφατο θάνατο του καθηγητή Γεωργίου Δάϊκου

Front Cover Illustration:

The late Professors Antonis Bilis, George Daikos, and Nikos Papadogiannakis pictured at a social event during the 3rd Panhellenic Congress of Nephrology, held in Patras, Greece, 17–19 May 1984. All three were mentors to dozens of Greek nephrologists, including the Editor of *Deltos*. The Editorial Committee of this Journal extends its sincerest condolences on the recent passing of Professor George Daikos.

Deltos

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Ἐπίσημη ἔκδοση
τοῦ Συλλόγου «Φίλοι Μουσείου Ἑλληνικῆς Ἰατρικῆς»
τοῦ «Διεθνοῦς Ἱπποκρατείου Ἱδρύματος Κῶ»
καὶ τοῦ «Ἱδρύματος Ἱστορίας τῆς Ἰατρικῆς Ν.Κ. Λοῦρος»

Deltos

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Type	Typical length	Notes
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Author-surname Initials. Title of article. Journal-abbrev Year;Volume(Issue):Page-range.
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Each table on a separate page, numbered consecutively, with a brief caption.

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- Supply separate high-resolution files (≥ 300 dpi).
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- Group legends after the tables, each beginning "Figure X – …".

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Avoid if possible; otherwise number consecutively after the references.

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Editorial

This issue is the third of Deltos' new life. It continues the tradition of the previous two with a balance between Greek and foreign contributions and scientific works with art. The current contents include three biographies, two articles with a philosophical interest, two more articles on medicine and poetry as a continuation of Deltos 52 on the subject, a review article about the history of renal transplantation in Mexico in relation to its neighbouring countries, one on the history of veterinary medicine in Turkey, another one on medical sociology, a rather neglected theme in the literature, a Book Review and sadly, two Obituaries.

Professor Shifra Shvarts and colleagues from Jerusalem Israel, relate the story of the first woman doctor in the Holy Lands with interesting and in-depth research on her activities and the social environment which she worked in. The second biography is by Dr. Maria Rosa de Santo from Naples Italy and reveals details of Elio Lugaresi's: work on Sleep Medicine. The last biography is by Androniki Chrysafi and Marios Marselos presenting the life and works of Kírikos Herétis, a physician from Crete and a scholar of the European Enlightenment, one of the few Greek medical doctors educated then in a Western University and practiced his art mainly in Istanbul. The then pioneering work on renal transplantation in the middle of the 20th Century in Central and Latin America is presented by Carlos Viesca and Maríablanca Ramos R. de Viesca. We are used to similar articles about the history of Haemodialysis and Transplantation in European countries, USA and Australia, hence, we enjoy a contribution from another part of the world. Şahin, Elif from Istanbul, Turkey presents a rare, for a journal on the History of Medicine theme, the History of Veterinary Medicine in the Ottoman Empire and later in Modern Turkey. The two articles on Medicine and Poetry, one by Mouhssine Adnane and El Bachir Benjelloun from Fez, Morocco, the other by the author of this Editorial are dealing with verses on therapeutics in Islam Byzantium and beyond during similar eras, the Late Middle Ages. Konstantina Konstantinou from Athens, Greece, makes a short contribution on the relation of medicine and ancient philosophy, while Davide Viggiano from Naples, Italy, contemplates on a rather modern philosophical issue, the relation between knowledge production and locality of the researches. Efi Poulakou-Rebelakou's and colleagues' article on the social advancement of two Greek benefactors related to medicine elucidate the undercurrent strength of the two main elements of the New Greek Kingdom, Christian Orthodoxy and Classical revival, into underpinning the benefactors' Greek identity albeit in a foreign environment. Helios Poros' Book Review of Petros Bouras-Vallianatos' and Dionysios Stathakopoulos' (2024), eds., Drugs in the Medieval Mediterranean Transmission and Circulation of Pharmacological Knowledge, Cambridge: Cambridge University Press, is a refreshing contribution by a young student attempting successfully to deal with this heavy subject. Lastly, there are the two obituaries. One on the retired Army General Medical Officer Elias Papadimitrakopoulos by Lambros Vazaios and the other on Professor Emeritus George Daikos by his nephew George Daikos and George Petrikkos. The merits of the deceased are well presented in the obituaries. Concluding this Editorial a comment is due on the bright and elegant and correct Greek language they both used in their written and spoken works. And the unavoidable regret on its deterioration by the z generation using greeklish and the abbreviated SMS dialect. As a consolation let us recall Horace's similar comments in the 1st century BC: *"It has been, and ever will be, allowable to coin a word marked with the stamp in present request. As leaves in the woods are changed with the fleeting years; the earliest fall off first: in this manner words perish with old age, and those lately invented nourish and thrive, like men in the time of youth. We, and our works, are doomed to death: […]. Mortal works must perish: much less can the honor and elegance of language be long-lived. Many words shall revive, which now have fallen off; and many which are now in esteem shall fall off, if it be the will of custom, in whose power is the decision and right and standard of language."* (Horatii Flacci Epistola Ad Pisones, De Arte Poetica, translated by C. Smart.

Athanasios Diamandopoulos
Editor-in-Chief

Deltos

Deltos 2025 June 35(53):9–15

Dr. Alexandra Belkind: Pathmaker in Women's Health in the Holy Land/Land of Israel 1905-1912

Shifra Shvarts[1], Zipora Shehory-Rubin[2], Pnina Romem[3*], Yitzhak Romem[4]

Figure 1. Alexandra Belkind (on the right) as a medical student in Geneva, 1903

Abstract

In 1906, a women's clinic was established in Jaffa- the first of its kind in the Holy Land / Land of Israel under Ottoman rule. The establishment of this clinic, which operated between 1906-1914 was revolutionary, serving as a catalyst for change in societal attitudes towards women's health, particularly within the Muslim community. During the operation of her women's clinic, Dr. Belkind treated approximately one thousand women whom she diagnosed and/or treated for female-specific conditions (gynaecology, maternity and mental health) alongside general medical concerns such as influenza and various inflammatory disorders. The clinic provided medical care on a non-sectarian basis without discrimination on racial or religious grounds, and over half of her patients were Muslims, while the remainder were equally divided between Jewish and Christian women. The clinic's patient files constitute a unique primary source of information documenting how women's health issues were viewed and addressed at the start of the 20th century in the Holy Land / Land of Israel under Ottoman administration. In her medical reports, Dr. Belkin addressed in particular issues such as

[1]Shifra Shvarts, Professor (Emerita, active) Moshe Prywes Center for Medical Education, Faculty of Health Sciences, Ben Gurion University of the Negev, Israel.
[2]Zipora Shehory-Rubin, Professor, Kaye Academic College of Education, Beer Sheva, Israel
[3*]Pnina Romem, PhD., Died 2017.
[4]Yitzhak Romem, MD, Soroka University Medical Center (retired), Beer Sheva, Israel.

sexual relationships, abortion, domestic violence as well as malnutrition, and high infant mortality and suicide among women. She provides details on the impact of forced adolescent marriage on women's health and the link between child marriages and secondary infertility, psychological problems and stillbirths. As a compassionate listener, Dr. Belkind, recorded their complaints in her files, noting in detail the psychosocial significance of the contents of her conversations. The study, based on Dr. Belkind's medical files on female patients she treated in this area between 1906-1914, provides valuable insights regarding the specific health problems faced by Muslim women in particular in the early 20th century in the Land of Israel and into the complex interface between Western medicine and women from a traditional society.

Key Words: *Women's health, infertility, child marriage, palestine, folk medicine –*

Introduction

Health and disease were pivotal concerns for the survival and continuity of the Jewish community in the Land of Israel in the 19th century[a].

In the mid-19th century, the Jewish community was small and far from robust, numbering approximately 55,000 individuals, residing in Jerusalem, Hebron, Safed and Tiberias and in a handful of Jewish agricultural villages in the vicinity of Jaffa. Most Jews made a modest living as artisans or small-scale merchants, supplemented by charitable stipends from Jewish communities abroad. Living conditions were harsh, characterised by overcrowding and an absence of basic sanitation. Sewage flowed freely down the centre of the streets, drinking water was obtained from rainwater cisterns during the winter, and only the affluent could afford spring water transported from outside the cities. Even poorer conditions prevailed in Arab urban and rural communities. Consequently, the population of the Land of Israel suffered from a high prevalence of disease and elevated mortality rates throughout the 19th century. Women's health, shaped by repeated pregnancies, childbirth, and child-rearing in adverse conditions, was particularly precarious. The hardship endured by women and its toll on their health were documented by pilgrims and other travellers to the Holy Land during this period.

Dr. Titus Tobler, a Swiss physician and avid Orientalist, travelled four times to the Land of Israel during the 19th century. In a medical monograph published in 1855, he observed that the onset of menstruation - and therefore fertility - in the Land of Israel took place very early, contributing to the widespread custom of teenage marriage. He noted that: *"14-year-old mothers were common"*.[12] He also remarked that women's fertility ended early, typically in their forties, causing great concern amongst women in the Land of Israel. Fertility was a major concern for both women and men, and Tobler reported it was common for inhabitants to turn to folk healers to solve their problems. Tobler's reports on Jewish women's health quotes Dr. Simon Fraenkel - the first Jewish doctor in the Holy Land - who had been sent to the Land of Israel in 1843 by philanthropist Sir Moses Montefiore to open a clinic in Jerusalem. Tobler highlighted the dangers posed by untrained midwives, whose reliance on unregulated folk remedies and birthing customs often resulted in harm to mothers. He also reported high infant and maternal death rates during childbirth, particularly in Jerusalem.

Ita Yelin, a resident in the Old City in Jerusalem at the close of the 19th century, described in her 1929 memoir *For My Offspring*[3] the arduous lives of the women of her generation - fetching water from cisterns, unrelenting household chores, and childrearing under extremely poor conditions. Yelin emphasised the devastating emotional toll of losing children, noting that on average four out of every five infants did not survive their first year. This profound grief had a lasting impact on the physical and emotional health of mothers.

A similar depiction emerges in the descriptions of Jewish philanthropist Karl Netter (1826-1882)[b]. Following a visit to the country in 1868, Netter reported that he had not encountered a single teenage girl over the age of 15 who was not married. In his view, such child marriages were the primary factor behind the poor health status of women in the Jewish community in Israel as a whole. Because financial assistance from Jewish communities in Europe to their Jewish brethren in the Holy Land was allocated on a family basis, families had an invested interest in marrying off their children when they were still young in order to receive addition financial support for the new family unit.

[a] The Land of Israel was part of the Ottoman Empire's Greater Syria governate until 1918.

[b] Karl Netter was one of the leaders of the "Universal Israelite Alliance", an international Jewish organisation founded in 1860 in Paris to modernise Jewish life, primarily through education, and was also the founder of the first agricultural school in the Land of Israel - Mikveh Israel - in 1870.

Because the young couple - usually a 13-year-old girl and 17-year-old boy -continued to live within the family home, the arrival of their children only exacerbated already overcrowded living conditions, compounding the existing hardships. In practice, the additional financial support did not alleviate poverty but rather intensified the families' difficulties. In Netter's view, such child marriages led to higher rates of divorce, increased frequency of second and third marriages, physical and mental frailty, and even infertility[4]. Initiatives to delay the age of marriage for such child brides failed. The Evelina de Rothschild Secondary School in Jerusalem set a 200-French franc incentive grant for any girl who completed three years of schooling and reached the age of fifteen before marrying. Nevertheless, only a small number of pupils qualified for the award[5].

Dr. Bernhard Neumann who worked in Jerusalem as a private physician from 1847, and later served as director of the city's Rothschild Hospital, noted the same problems[a]. In a book he published in 1877 entitled *The Holy City and Its Inhabitants*[6]. Neuman said women's health was one of the most difficult medical problems in the Jewish community, writing:

> Reaching sexual maturity occurs in southern lands earlier than in northern ones, achieving womanhood among girls in Jerusalem in particular and in Syria in general already at the age of 11-13 years. It is not incidental at all that young women aged 14 years bear children, and just as their menstrual cycle appears early, thus it disappears earlier and together with it their fertility ceases: at age 35 or at the most 40 years of age cessation of menstruation already appears.
>
> Out of more than a thousand births that I recorded… widespread fertility emerges at age 15-20... and at age 31-40 [fertility] increasingly becomes rare, and after this age it ceases entirely. …that child marriages had a harsh impact on women's health, particularly among young girls. The direct leap from childhood to motherhood without any opportunity to experience their youth was detrimental to the soul and the health of such child mothers. Depression, secondary infertility, inability to function as required, and more...[7]

Jerusalem appeared frequently in various reports on the health status of women in the Land of Israel.

Most women gave birth at home, assisted by a midwife. A combination of poor nutrition, early marriage and childbirth, multiple pregnancies and offspring, high infant mortality and widespread poverty, took a harsh toll on women's health and led to high mortality among both women and children.

Aware of the lack of access to modern medical practice, Alexandra Sonia Belkind resolved to study medicine abroad, in Geneva.

Dr. Alexsandra Sonia Belkind

Alexandra Sonia Belkind was born in 1872 in Minsk, Belarus, then part of the Russian Empire, to Shifra and Meir Belkind. In 1883, the Belkind family immigrated to the Land of Israel and initially settled in the fledging agricultural village of Rishon-le-Zion ('First in Zion') established southeast of Jaffa in 1882.

In 1898, at age 26 - considered a spinster by the standards of the time - Alexandra decided to study medicine in Geneva. After completing her medical studies in Geneva with honours, she moved to Paris to begin a residency specialising in gynaecology. Her letters from this period testify to the emotional stress she experienced, expressing homesickness for her family and homeland - feelings of melancholy that were further intensified by the sorrow of a romantic relationship that ended in separation.

In 1906, Dr. Alexandra Belkind returned to the Land of Israel, determined to effect a transformative change in women's health. The medical license granted to her by the Ottoman authorities bore the serial number 29, testifying to the acute shortage of doctors at the time.

Women's Health: Findings

In that same year, Dr. Belkind opened her own private clinic in Jaffa, intending to focus on treating women, who, indeed, began seeking her care in large numbers.

She said:

> At the beginning my work was limited solely to healing women's diseases. But after one year, my clientele began to expand little by little - and they began coming to me also about manners of other pathologies besides women's diseases[8].

Following the establishment of her clinic, Dr. Belkind was also appointed by the Ottoman authorities to serve as an expert witness in court cases concerning women's health, including claims for compensation for loss of virginity, annulment of marriage contracts due to infertility problems, and similar issues.

In her personal journal, she recorded:

> Little ones [sic. single-betrothed girls] come to me for virginity checks [i.e. to establish they were

[a] The first Jewish hospital in the Land of Israel, founded in 1854.

UNIVERSITÉ DE GENÈVE

Diplôme de Docteur en Médecine

Nous, Alfred Martin, professeur de Droit civil, RECTEUR DE L'UNIVERSITÉ,

Vu le certificat de la FACULTÉ DE MÉDECINE constatant que Mlle Alexandra Belkind a subi les épreuves exigées par les lois et règlements;

Donnons par ces présentes à Alexandra Belkind le diplôme de DOCTEUR EN MÉDECINE pour en jouir avec les droits et prérogatives qui y sont attachés.

Expédié à Genève, le 23 Janvier 1905. avec le sceau de l'Université.

Le Recteur de l'Université, Alfred Martin

Le Doyen de la Faculté, Le Secrétaire de l'Université,

Figure 2. Dr. Belkind's MD Diploma, 1905.

still virgins] in all sorts of cases of irregularities [in their anatomy], for this purpose they are brought by their parents or sent by the powers-that-be. Such [virginity] checks were 14 in number.

Between 1906 and 1912, Dr. Belkind kept a detailed record of one thousand women who visited her clinic. These records include patient backgrounds, diagnoses and treatments, and also serve as a continuous 'personal journal' reflecting her psychosocial and cultural observations regarding her patients.

She subsequently transformed these six years of clinical notes into a body of qualitative and quantitative data, which she presented at the inaugural conference of the Medical Federation in the Land of Israel, convened in 1912. To the best of our knowledge, this was the first data-based study on women's health in the Land of Israel to be presented at a scientific conference and subsequently published in its proceedings.

According to Dr. Belkind, the majority of clinic visits (60%) were one-time consultations, while only 20% of the patients returned regularly. Of the one thousand women treated, 600 sought help for various infections. Most of them were Muslim women[9].

The second most common reason Muslim women

Figure 3. Dr. Belkind in her clinic in Jaffa, 1905.

visited her clinic related to fertility issues. In her 1912 research report, she noted the cultural backdrop and psychosocial context underpinning these concerns:

> The native woman rarely attends to her health and reproductive organs as long as she continues to bear children. Many times, I heard expressions such as this: I don't care if I'm ill as long as I can get pregnant… Infertility is just the opposite, particularly for the Arab woman, in requests from her doctor. The Arab woman doesn't suffice with the number of children she has. Some of them already have given birth to 6-7 children and they come to the doctor and request a medication to bear more [children][10].
>
> An infertile woman in countries of the East is a miserable soul second to none because she can be sure her husband will marry another woman, and therefore she turns on blind faith to the first midwife she comes across and listens totally submissively to everything she is ordered to do...provided she will ovulate and give birth to sons[11].

Belkind reported that 128 (13%) of the one thousand patients who turned to her were totally infertile and 26 were mothers to an only child. More than two-thirds of individuals in her files were Arab women, for whom Dr. Belkind was the only option for medical care, advice and assistance at the time, since in Arab Israeli culture it was not customary for Arab women to consult male doctors for "female matters"[12]:

> The numbers demonstrate that most of my work was with native-born Muslim women, the reason resting on religious tradition that a Muslim woman (save very few exceptions) would not agree under any circumstances to be examined by a male doctor. Moreover, this being so despite cases of illness being a lot more prevalent among them than among other women because the Muslim women don't have the slightest idea about the simplest laws of health and therefore are liable to be affected by all sorts of afflictions and infectious diseases[13].

Dr. Belkind said that the fact most of her patients were uneducated created special challenges:

> It is very difficult to cure a patient who lacks education. The doctor can't always know from what she [sic. the patient] says, what happened to the patient, whether she followed the doctor's orders correctly and to what degree the medical treatment she received worked. In most cases, she quickly disappears in the middle of the curative process from the doctor's eyes, or the doctor hears about her from others [i.e. second-hand]...[14]
>
> The age of the women who were cured by me was very different [sic. widespread], they [ranged] from 10-year-old girls up to 60 and more. If you ask an Arab woman: How old is she? she won't know how to answer precisely. The physician must judge her age according to external appearance or on a few conjectures".[15]

Dr. Belkind reported a particularly high number of women who sought psychotherapeutic support, seeking treatment not only for physical ailments but also for emotional distress and mental health concerns. She described the difficulties experienced by women in menopause (then occurring around the age of 40), as well as by those coping with stillbirths, spontaneous or induced abortion, and both primary and secondary infertility. Further challenges included emotional and functional distress among women whose husbands practised polygamy, and among those subjected to mental and physical domestic abuse. In her "research report', Belkind stressed in particular the problems of young girls aged 12 and 13 who were forced into marriages with older men and suffered sexual abuse.

> I'll mention here that I was many times summoned to the city to treat little girls who were married off and after the first sexual intercourse their genitalia were torn and bled profusely…As well, more than once or twice that I was called to treat little ones who were married off to a man before they reached womanhood and were infected with gonorrhoea, as well as all the repercussions of this...[16]

Belkind noted the high prevalence of venereal disease in general, and the variations in incidence across ethnic and sub-ethnic groups**.** Thus, she noted the low incidence of syphilis among Jewish women compared to Arab women, and the high incidence of gonorrhoea among Sephardic Jewish women compared to Ashkenazi Jewish women.

She recorded performing 72 induced abortions in cases where pregnant women were experiencing severe haemorrhaging. She cited cases where she conducted surgery to "repair and stitch-close the hymen" in order to protect girls from retaliatory violence by male family members [so-called 'honour killings'], particularly among Arab families[17].

Belkind detailed countless futile attempts to convince Arab women to let her assist them in delivering their babies, and to agree to repair vaginal tears from childbirth - a new procedure she had learned in Europe. In six years of practice and a thousand patients, only 18 women agreed to have their vaginal tears stitched

up, and only several dozen women agreed that she, a doctor, would deliver their babies in lieu of a local midwife. In addition, she cited 19 cases of childbirth fever that came into her care.

> More than anything the Arab midwives bring [upon the women giving birth] affliction out of their ignorance, causing bad outcomes post-partum and tears in reproductive organs that subsequently result in defects and pathologies to those organs […][18]
>
> These midwives permit themselves to do everything: They heal the sick, dispense medications for infertility and so forth. I'm not well versed in the medicines and remedies that these midwives employ in healing but I had cases healing women who found themselves contaminated by makeshift cotton 'plugs' (tampons) that contained all sorts of material that had been chewed with the teeth, and including even onions and the likes.

In total, Dr. Belkind reported treating 634 Muslim women, 229 Jewish women and 137 Christian women. Among them were Syrians, Greeks, Germans and Italians. Notably, however, only six of the thousand women in her patient registry were Yemenite Jews, despite the presence of several hundred Yemenite Jews in the region at the beginning of the 20th century.

Thus, Dr. Belkind's report at the conference was not only (as already noted), the first scientific study to focus on women's health issues in the Land of Israel, but also remarkable in its scope. Her documentation encompassed women from all the major ethnicities and religions in the country.

Postscript

The outbreak of the First World War in 1914 disrupted Dr. Belkind's focus on gynaecology and led to the closure of her women's clinic. When she reopened her private clinic in Jaffa in 1918, Dr. Belkind chose to broaden its scope, treating anyone who sought her services as a private family doctor.

Alexandra Belkind married late in life, at the age of 57, to Mendel Henkin, the brother of her brother-in-law. She lived in a joint two-story Tel Aviv residence with her sister Olga and her brother-in-law in Tel Aviv until her death in 1943.

Although she had no children, Dr. Belkind bequeathed a sum in her will to establish a rest home for doctors and promote the building of a home in Tel Aviv for the doctors' professional organisation, including conference facilities. This came to be known as the "Physicians' House".

Dr. Belkind - Statistical Notes:[19]

634 Moslem women 63.4%
229 Jewish women 22.9%
137 Christian women 13.7%

The majority of the women were illiterate, mainly the Muslims, and ignorant of the basics of body hygiene

60% of the patient visits were a single visit
20% 2 to 3 visits
20% regular visits

The main motivation to consult with a doctor was infertility even in cases of secondary infertility with 6-7 children

Symptoms diagnosed in the files[20]

Infertility 15.4%
Primary infertility 12.8%
Secondary infertility 2.6%
Infections: 600 cases out of 1000 patients
Venereal diseases: mainly gonorrhoea
Tumours
Myomas of all kinds
Uterine prolapse

Infertility[21]

50% mechanical infertility
Morbid obesity
Congenital malformations
Early menopause
Gonorrhoea
Male factor
Vaginismus (painful spasm of the vagina)

ΠΕΡΙΛΗΨΗ

Dr. Alexandra Belkind: Πρωτοπόρος στην υγεία των γυναικών στη Γη του Ισραήλ 1905-1912

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Το 1906, ιδρύθηκε στην Γιάφα μια γυναικολογική κλινική – η πρώτη του είδους της στο Ισραήλ που τελούσε υπό οθωμανική κυριαρχία. Η ίδρυση της κλινικής, η οποία λειτούργησε κατά την περίοδο 1906-1914, υπήρξε επαναστατική, λειτουργώντας ως καταλύτης για την αλλαγή των κοινωνικών αντιλήψεων σχετικά με την υγεία των γυναικών, ιδίως εντός της μουσουλμανικής κοινότητας. Κατά τη διάρκεια λειτουργίας της κλινικής της, η Δρ. Μπελκάιντ παρείχε ιατρική φροντίδα σε περίπου χίλιες γυναίκες, τις οποίες διέγνωσε ή/και θεράπευσε για παθήσεις που αφορούσαν αποκλειστικά το γυναικείο φύλο (γυναικολογία, μητρότητα και ψυχική υγεία), καθώς και για γενικότερα ιατρικά ζητήματα όπως η γρίπη και διάφορες φλεγμονώδεις παθήσεις. Η κλινική παρείχε ιατρική περίθαλψη χωρίς διακρίσεις, ανεξαρτήτως φυλής ή θρησκεύματος· πάνω από το ήμισυ των ασθενών της ήταν μουσουλμάνες, ενώ οι υπόλοιπες διαιρούνταν ισόποσα μεταξύ εβραίων και χριστιανών γυναικών.

Οι φάκελοι των ασθενών της κλινικής αποτελούν μοναδική πρωτογενή πηγή πληροφοριών για την προσέγγιση στην αντίληψη των ζητημάτων υγείας των γυναικών στην αυγή του 20ού αιώνα στο Ισραήλ. Στις ιατρικές της αναφορές, η Δρ. Μπελκάιντ εστίασε, μεταξύ άλλων, σε θέματα όπως οι σεξουαλικές σχέσεις, η άμβλωση, η ενδο-οικογενειακή βία, ο υποσιτισμός, καθώς και η υψηλή βρεφική θνησιμότητα και τα ποσοστά αυτοκτονιών μεταξύ των γυναικών. Περιέγραψε λεπτομερώς τις επιπτώσεις του καταναγκαστικού γάμου στην εφηβεία στην υγεία των γυναικών, καθώς και τη σύνδεση μεταξύ των γάμων σε παιδική ηλικία και της δευτερογενούς υπογονιμότητας, των ψυχολογικών διαταραχών και των αποβολών. Ως συμπονετική συνομιλήτρια, η Δρ. Μπελκάιντ κατέγραφε τις αφηγήσεις των γυναικών στους φακέλους της, σημειώνοντας με προσοχή τη ψυχοκοινωνική βαρύτητα των περιεχομένων των συζητήσεών της.

Η παρούσα μελέτη, βασισμένη στους ιατρικούς φακέλους των γυναικών που περιέθαλψε η Δρ. Μπελκάιντ μεταξύ 1906-1914, προσφέρει πολύτιμες γνώσεις για τα ιδιαίτερα προβλήματα υγείας που αντιμετώπιζαν, ιδίως οι μουσουλμάνες γυναίκες στις αρχές του 20ού αιώνα στο Ισραήλ, καθώς και για τη σύνθετη διασύνδεση μεταξύ της δυτικής ιατρικής και των γυναικών μιας παραδοσιακής κοινωνίας.

Λέξεις Κλειδιά: *Υγεία των γυναικών, υπογονιμότητα, παιδικοί γάμοι, παλαιστίνη, παραδοσιακή ιατρική*

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The First Steps of Renal Transplants in Mexico

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Abstract

Following the first successful kidney transplants performed by Joseph Murray and John Merrill in 1954, Mexican physicians and researchers began their own work in the field. Prompted by developments abroad, they engaged in theoretical study, laboratory research, and experimental procedures.

In 1962, José Carlos Peña established Mexico's first chronic haemodialysis programme at the Hospital de Enfermedades de la Nutrición, followed shortly by an intraperitoneal dialysis programme. That same year, the country's first kidney transplant from a living donor was performed by Manuel Quijano Narezo and Federico Ortiz Quezada. Two years later, the first transplant in an adult patient was conducted, and in 1967, the first procedure involving a cadaveric donor took place. A formal renal transplant programme was finally established in 1975 at the Mexican Institute of Social Security (IMSS).

Key Words: *Kidney Transplantation, Haemodialysis, History of Medicine, Mexico*

The First Renal Transplants in Mexico

Antecedents

The kidney was the first solid organ to be transplanted. As early as 1902, experimental attempts at renal transplantation in animals were underway. The Austrian surgeon Emerich Ullmann reported having transplanted a kidney into the neck of a dog, and shortly thereafter performed a similar procedure using a dog's kidney implanted into the neck of a goat. He later confessed to attempting a pig-to-human transplant by placing a pig's kidney into the elbow of a young woman, although this was ultimately unsuccessful due to technical limitations.

In the same year, Alexis Carrel also initiated experimental kidney transplants in dogs, implanting the organ in the neck of the recipient. He reported that circulation and urine output were successfully restored, but the animal died of acute infection. Nevertheless, Carrel concluded – prophetically - that "organ transplantation, a surgical curiosity today, may one day have a definite practical value…" (Küss & Bourget, 1991, pp. 27–28).

Mathieu Jaboulay was the first surgeon to attempt kidney transplantation in humans, reporting two cases in which pig and goat kidneys were transplanted into the cubital fossa of human recipients. Both attempts were unsuccessful due to vascular thrombosis. Three decades later, in 1933, the first recorded case of a homologous renal transplant was reported by Yuriy Voronoy. The donor was a 60-year-old man who had died following a skull base fracture, and the recipient was a 26-year-old woman in uraemic coma. She died four days after the transplant. Between 1933 and 1949, Voronoy performed five further cadaveric kidney transplants, all of which were unsuccessful.

In 1947, at the Peter Bent Brigham Hospital in Boston, Karl Landsteiner, Hufnagel, and David Hume reported a unique transplant case. The recipient eventually recovered native kidney function, and the graft was subsequently removed once normal renal function was confirmed.

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In the 1950s, kidney transplantation began to be practised systematically by David Hume and John Merrill in the United States, and by Jean Hamburger in France (Küss & Bourget, 1991, pp. 32–47; Ortiz Quezada, 1987, p. 94).

The first truly successful renal transplant was achieved following the acceptance of Küss's proposal that transplantation should initially be restricted to monozygotic twins. On 23 December 1954, Joseph Murray, John Merrill, and J. Hartwell Harrison performed a kidney transplant between 23-year-old identical twins, one of whom was suffering from advanced renal failure. Notably, the recipient's diseased were not removed until six months later. Over the following years, seven additional successful transplants were performed, all involving monozygotic twins (Küss & Bourget, 1991, pp. 45–46). At the same time in France, Jean Hamburger carried out six unsuccessful cadaveric transplants using kidneys from executed criminals. However, in 1962, he began a series of successful procedures after introducing pre-transplant radiotherapy for recipients.

First Steps Towards Renal Transplantation in Mexico

In Mexico, there was a clear and growing interest in renal disease and kidney failure, which intensified during the 1950s in response to emerging treatment approaches. In 1953, Ricardo Labardini y Nava published a notable paper entitled *"Vividiálisis y riñón artificial" (Dialysis in Living Subjects and the Artificial Kidney)* in the *Academy of Surgery Journal*. The publication attracted commentary from Aquilino Villanueva, a pioneer of modern nephrology in Mexico, who expressed his optimism regarding the potential of haemodialysis as a viable method for managing chronic renal failure (Labardini, 1953).

It was not until 1962 that José Carlos Peña, at the Hospital de Enfermedades de la Nutrición, established the first chronic haemodialysis programme in Mexico. Dr Peña returned to the country following his specialist training in nephrology at the Peter Bent Brigham Hospital in Boston, becoming the first formally trained nephrologist in Mexico. Between 1960 and early 1962, he trained under the guidance of John Merrill and Joseph Murray - pioneers in nephrology and renal transplantation - witnessing first-hand the progression of the first successful kidney transplant between non-identical twins. During this period, Dr Peña acquired a foundational understanding of haemodialysis, primarily from Merrill, who was a leading figure in the development of this therapeutic modality (Fig. 1).

Dr José Carlos Peña recognised haemodialysis as an indispensable element for the success of renal transplantation, providing the necessary artificial maintenance of renal function and thereby allowing time to identify a suitable donor (Peña, 2023, p. 188). In addition to establishing haemodialysis in Mexico, Peña also developed and implemented intraperitoneal

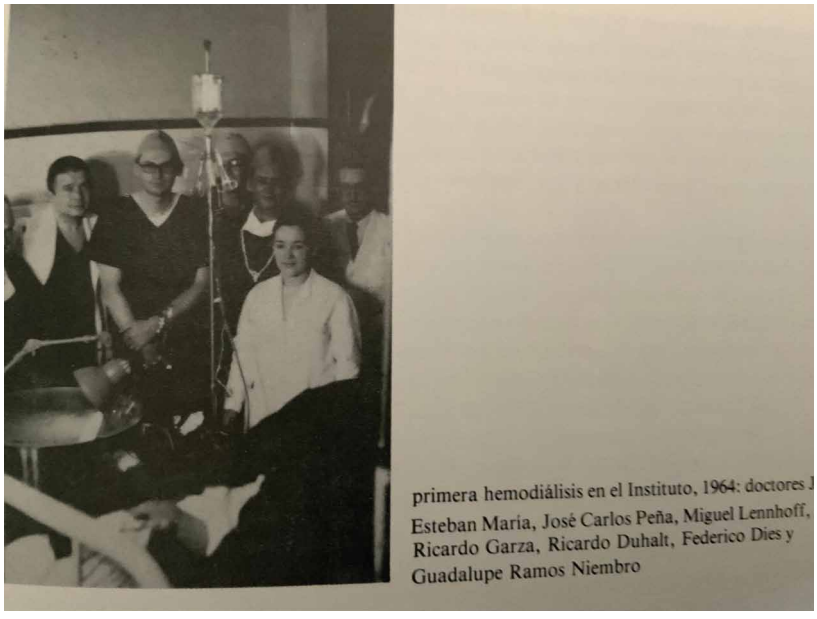

Figure 1. The first haemodialysis, José Carlos Peña and his collaborators. 1962.

dialysis, drawing on the innovative models of Wilhelm Kolff. He further introduced the practice of creating external urinary fistulas, as originally described by Scribner. These topics featured prominently in his early presentations at the *Academia Nacional de Medicina de México* (Peña, 1968; Cárdenas de la Peña, 1991, I: 371). In 1964, he published his findings on peritoneal dialysis as both a therapeutic measure and a support method for patients with renal insufficiency (Peña, 1964). His contributions extended beyond his own institution, serving as the foundation for similar dialysis programmes at the *Hospital Infantil de México* - today named after its founder, Federico Gómez - and at the General Hospital of the National Medical Centre of the Mexican Institute of Social Security *(Hospital General del Centro Médico Nacional, Instituto Mexicano del Seguro Social, IMSS).*

This foundational groundwork proved essential, as did the arrival of Federico Ortiz Quezada to the Urology Service at the General Hospital of the National Medical Centre of the Mexican Institute of Social Security (IMSS) in July 1963 (Fig. 2). After completing his initial training as a specialist at the General Hospital of Mexico *(Hospital General de México)*, Ortiz Quezada continued his education at Cornell University in New York. There, he completed his urology training and both witnessed and participated in kidney transplant surgeries at the New York Hospital. Upon returning to Mexico and joining the Urology Service at the General Hospital of the Medical Centre, Ortiz Quezada advocated for the feasibility of performing renal transplants on actual patients. He presented clinical cases and consulted with his former professors in New York before moving forward (Méndez et al., 2014, p. 1107; Ortiz Quezada, 2024). In his Memoirs, Ortiz Quezada recounts his time as a medical resident in 1962 at the New York Hospital - Cornell Medical Center. Reflecting on the day the first renal transplant was performed at that institution, he wrote: *"I understood, alongside those committed surgeons, that in time we would be able to help those who once would have died from renal failure"* (Ortiz Quezada, 2001, p. 59).

The First Renal Transplant in Mexico

Shortly after Federico Ortiz Quezada's return in July 1963, the director of the hospital, Dr Manuel Quijano Narezo - a highly respected general surgeon - was persuaded by Ortiz Quezada that the time had come to initiate the first series of renal transplants in Mexico.

Manuel Quijano was born in San Luis Potosí in 1919 and passed away in Mexico City on 17 February 2017 (Fig. 3). He studied medicine at the National Faculty of Medicine in Mexico City and continued his surgical training in the United States and France. Upon his return to Mexico, he joined the General Hospital of Mexico (Hospital General de México) and later contributed to specialised developments in pancreatic and gastroduodenal surgery at the National Institute of Nutritional Diseases (Instituto Nacional de Enfermedades de la Nutrición). He subsequently served as director of the General Hospital of the National Medical Centre of the Mexican Institute of Social Security (Hospital General del Centro Médico Nacional, IMSS), where he remained actively involved in surgical innovation. It was at this

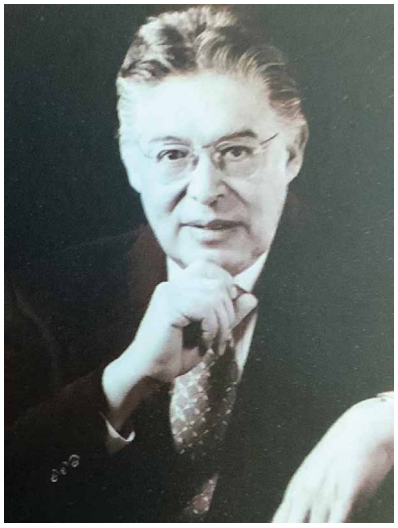

Figure 2. Dr. Federico Ortiz Quezada.

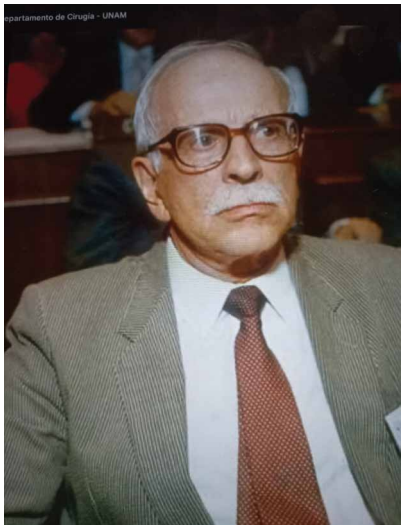

Figure 3. Dr. Manuel Quijano Narezo.

institution that he and his team performed Mexico's first renal transplants.

As previously noted, Dr Quijano had already established several important surgical precedents prior to his involvement in renal transplantation. In 1952, he became the first surgeon in Mexico to successfully perform a duodenopancreatectomy. In the years that followed, he conducted research into the relationship between metabolic processes and surgical procedures, and from 1957 onwards, he focused on the development of various surgical techniques in gastroduodenal and biliary surgery.

Thus, in the second half of 1963, Dr Manuel Quijano Narezo led the team that performed the first renal transplants in Mexico. The surgical team included Francisco Gómez Mont, Federico Ortiz Quezada, and Regino Ronces (Fig. 4).

The first patient was a 23-year-old man who had suffered from recurrent ureteral lithiasis and had developed a ureteral stricture. Following several procedures aimed at relieving the obstruction - along with two unsuccessful attempts at ureteroplasty - the only immediate solution was the creation of an external urinary fistula. At that point, and under the strong recommendation of Ortiz Quezada, Dr Quijano opted to perform an autotransplantation of the affected kidney. The kidney, which could no longer drain urine through the damaged ureter, was repositioned into the ipsilateral iliac fossa. As this was an autotransplant, immunological rejection was not an issue, and normal urinary function was soon restored. Thus, Mexico's first renal transplant - a successful autotransplant - was completed.

Figure 4. Dr. Francisco Gómez Mont.

The Immediate Subsequent Transplants

In the months following the first renal autotransplant, Dr Manuel Quijano Narezo and his surgical team performed two additional successful renal transplants during the same year, 1963.

The first of these involved a 31-year-old woman with a medical history of recurrent tonsillitis, which had resulted in severe episodes in 1960 and 1963, ultimately leading to advanced renal failure. Laboratory tests revealed urea levels of 329 mg/dL and creatinine levels of 16.2 mg/dL.

Prior to surgery, the patient underwent a six-hour dialysis session. The procedure was a homotransplant, with her 35-year-old sister serving as the donor. The donor was fully compatible in all leukocyte antigens, with the sole exception of the E antigen of the Rh group. Post-operatively, the recipient experienced anuria for the first 24 hours, after which diuresis resumed normally. In the hours that followed, she presented with haematuria, fever, and leucocytosis (22,000/mm^3). Immunosuppressive therapy began immediately after surgery, including Imuran (azathioprine), 6-mercaptopurine, and actinomycin. Cortisone was added in response to an antigen rise. A cystostomy was placed to monitor renal function. Twenty-one days after the transplant, a biopsy of the transplanted kidney was performed. One month after the procedure, a bilateral nephrectomy was carried out to remove the patient's native kidneys, leaving only the grafted kidney in situ as the definitive source of renal function (Quijano et al., 1964).

This surgical intervention took place on 23 October 1963. The patient, Martha Bejarano, received a homograft, as previously noted. She went on to live in good health for more than twenty years following the procedure, and her death was unrelated to renal complications or consequences of the transplant (Ortiz Quezada, 1987, p. 94).

The same surgical team performed a third transplant at the end of November 1963, just eight days prior to the official report of these initial cases. The original report, detailing all three procedures, was presented during a session of the *Academia Nacional de Medicina de México* on 6 December 1963 and subsequently published in the *Gaceta Médica de México*, the Academy's official journal, in its first issue of 1964 (Quijano et al., 1964, pp. 93–103).

The Procedure

The surgical intervention was carried out by two teams operating in parallel - one responsible for the donor and the other for the recipient.

The transplanted kidney was placed in the recipient's left iliac fossa.

The renal artery was anastomosed to the hypogastric artery using an end-to-end (termino-terminal) technique. The renal vein was connected to the external iliac vein via an end-to-side (termino-lateral) anastomosis. The ureter was implanted into the bladder using a submucosal tunnel technique to facilitate urinary drainage.

The immediate postoperative course was marked by a rapid and stable recovery. Following only one minute of ischaemia, normal blood flow to the transplanted kidney was successfully re-established. As previously noted, diuresis was fully restored within 24 hours. One month after the procedure, the patient's two damaged kidneys were surgically removed. Immunosuppressive treatment with Imuran was initiated to prevent antigenic rejection.

It is important to note that the official report was published only three months after the procedures took place.

Subsequent disclosures have added nuance to the original account. It has since been affirmed that the lead surgeon during these interventions was in fact Federico Ortiz Quezada, while Dr Manuel Quijano, as hospital director, oversaw and authorised the procedures. As a member of the *Academia Nacional de Medicina de México*, Quijano was listed as the first author of the published report, reflecting his official role (Ortiz Quezada, personal communication to Carlos Viesca). As a tribute to his pioneering work, the transplant operating theatre at the IMSS *Centro Médico Nacional* was later named "Federico Ortiz Quezada" in his honour.

In 1967, the same hospital and surgical team performed the first renal transplant in Mexico using a cadaveric donor.

That same year, Dr Gustavo Argil, a distinguished nephrologist, delivered a presentation to the *Academia Nacional de Medicina de México* as part of a symposium on the evaluation of treatments for chronic uraemia. In his address, he offered a detailed and timely analysis of the challenges and benefits of renal transplantation, presenting it as a truly feasible and valuable therapeutic option (Argil, 1968).

The Sequence

An interesting event occurred in 1965. That year, the distinguished urologist Carlos E. Talancón presented a reflection on renal transplantation before the Academia Mexicana de Cirugía (Mexican Academy of Surgery), which was subsequently published in the Academy's journal, *Cirugía y Cirujanos*. What stands out is that the article made no reference to the renal transplants that had already taken place in Mexico. Instead, it focused on reviewing major international developments in the field. Talancón highlighted several key findings from recent studies, including the identification of 15 genes in mice related to antigenic response, the role of lymphocytes in homograft rejection, the promising use of splenectomy as a method of rejection prophylaxis in animal models, and the beneficial effects of radiation-induced lymphopenia. He also presented statistics from the XIII International Congress of Urology, held in London in September 1964, which raised important questions. Among the data shared were that only one out of 120 unrelated-donor homotransplants had survived beyond one year, and just five out of 91 transplants from closely related donors had survived longer than two years. In stark contrast, 28 out of 33 kidney transplants between identical twins had resulted in long-term survival. Talancón concluded with a reference to the landmark 1954 transplant performed by Harrison and Murray in monozygotic twins, emphasising its historical significance (Talancón, 1965).

In practical terms, research on renal function, artificial kidneys, and dialysis continued at the Instituto Nacional de la Nutrición. In 1965, an initial Transplant Unit was established, as part of a broader and more ambitious Division of Experimental Surgery. This unit was placed under the direction of Dr Carlos de la Rosa, who had recently completed his surgical specialisation under Lester R. Dragstedt in Florida. On 17 August 1967, the unit carried out its first kidney transplant: a cadaveric homograft in a young woman. Although the immediate postoperative course appeared satisfactory, the patient ultimately died from generalised sepsis resulting from a pericardial abscess. The surgical team included Manuel Campuzano as lead surgeon (Fig. 5), with Sergio Cárdenas and Carlos de la Rosa as surgical assistants, Gabriel Camacho as anaesthesiologist, and José Carlos Peña as nephrologist (Cárdenas de la Peña, 1991, pp. 374, 397). One year later, on 14 August 1968, the same institute performed its second kidney transplant, this time using a living donor. The recipient was a 29-year-old man with chronic glomerulonephritis and renal failure; the donor was his 27-year-old sister. The operation was preceded by all diagnostic and preparatory procedures then available, including histocompatibility testing, renal function assessments, pyelography, aortography, and eight months of haemodialysis. Notably, the patient received

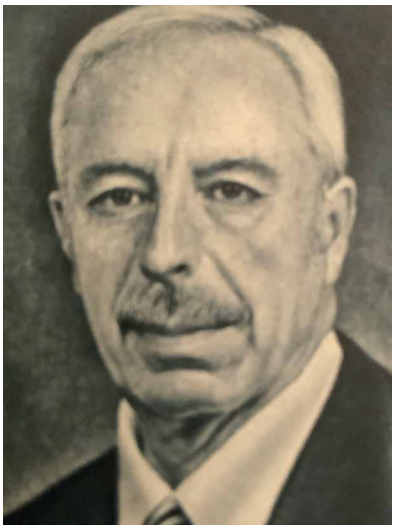

Figure 5. Dr. Manuel Campuzano

antilymphocytic globulin as part of the immunosuppressive regimen - marking the first use of this therapy in Latin America. The transplant was successful, and after one month of postoperative hospitalisation, the patient was discharged in full recovery (Cárdenas de la Peña, 1991, vol. I, pp. 375–398).

In order to establish a national transplant programme, the Academia Nacional de Medicina, acting in its role as a consultative body to the Mexican Government, was requested to issue an official statement regarding organ transplantation in human subjects. The Academy's response was, logically, favourable. However, it recommended that any such procedures be carried out only under conditions that ensured reasonable safety for both donor and recipient. It also emphasised the necessity of conducting all relevant medical and ethical evaluations prior to transplantation (Academia Nacional de Medicina, Dictamen, 1968).

In 1975, a renal transplant programme was established at San José Hospital in Monterrey, Nuevo León.

That same year, after several years of performing transplants on an individual case-by-case basis, a formal renal transplant programme was launched within the Mexican Institute of Social Security *(Instituto Mexicano del Seguro Social, IMSS).* This initiative was soon expanded and transformed into the National Coordination Office for the Institutional Transplant Programme within IMSS.

Subsequently, a broader national organ transplant programme was developed - encompassing not only renal transplantation - which remains active to this day and continues to play a vital role in the country's public health system.

The Latin American landscape

A comparative view of the first renal transplants across Latin America provides useful context to Mexico's early developments. The earliest attempt in the region occurred in Argentina. On 11 June 1957, Professor Alfredo Lanari of the Third Chair of Medical Clinics at the Hospital de Clínicas de Buenos Aires performed haemodialysis and renal transplantation on a 16-year-old recipient. The donor was an anencephalic newborn, and both kidneys were implanted together in the recipient's inguinal region. Unfortunately, survival was limited to only a few days (Maheles Molins and Alfonso Ruíz Guiñazú, p. 83). A second transplant attempt in Argentina took place in 1961, also led by Lanari, then working at the Buenos Aires Institute of Medical Research. On this occasion, an eight-year-old girl received a kidney from a cadaveric donor. The graft functioned successfully and showed no signs of rejection; however, the patient died 45 days later from sepsis (Pomeranz et al., 2014, pp. 83–84).

In the same year as Mexico's first renal transplant, 1963, Colombia also registered its first kidney transplant. The procedure took place at Hospital San Juan de Dios in Bogotá, performed by surgeons Fernando Gómez Rivas and Enrique Carvajal Arjona. A second transplant was reported in Bogotá three years later, in 1966, followed by another in Medellín in 1968, conducted by a surgical team comprising Jaime Borrero R., Álvaro Velázquez O., and Gustavo Escobar. It was not until 1973, however, that Colombia achieved its first truly successful renal transplant. This case involved a cadaveric donor, with the patient enjoying twelve years of good renal function before experiencing graft failure - after which a second successful transplant was performed (Restrepo, 1990, pp. 60–61).

Peru and Brazil both recorded their first renal transplants in 1965. They were followed by Chile in 1966, where the first procedure was performed on 22 November by Fernando Morgado, although the outcome was unsuccessful. On 4 January 1968, following extensive experimental work involving 145 transplants in dogs, a second human kidney transplant was carried out. This time, the kidney came from a cadaveric donor; however, the recipient survived only 42 days (Thambo, 2017; Lazcano et al., 1967).

Around the same period, Venezuela entered the field of renal transplantation. In 1967, a cadaveric donor transplant was performed at the Hospital Universitario de Maracaibo by Bernardo Rodríguez Iturbe and Humberto Rivera Orozco. The following

year, in 1968, a living donor transplant was carried out at the Hospital Universitario de Caracas. In 1969, kidney transplants were conducted in San José, Costa Rica, at the Clínica Católica, and in Uruguay, where, following extensive research involving animal models, two transplants from cadaveric donors were performed (Pereyra Bonassi, 1964; Rodríguez Juanicó, 1990, p. 185). In Cuba, at the Instituto de Nefrología in Havana, the first kidney transplant was conducted on 24 February 1970 by Oscar Suárez Savio and Alfredo Gómez Samperio. Shortly thereafter, Cuba developed Infomed, a national transplant and medical information network. In Bolivia, the first renal transplant was performed on 2 November 1979 in La Paz by Néstor Orihuela Montero, using kidneys from a single cadaveric donor for two recipients. Guatemala performed its first kidney transplant in 1982, followed by Panama in 1990.

Conclusions

Mexico was one of the earliest countries in Latin America to carry out a renal transplant, second only to Argentina. This early achievement was supported by academic exchanges between Mexican nephrologists and surgeons and their counterparts in the United States, who were global pioneers in renal transplantation.

A recent and significant success occurred on 21 February 2025, at Hospital Juárez in Mexico City. A medical team comprising Paulina Carpinteyro Espin, Head of the Transplant Unit; Juanita del Socorro Pérez Escobar, Director of the Liver Transplant Programme; and Ricardo Iván Velázquez Silva, Head of the Renal Transplant Programme, successfully performed a simultaneous liver and kidney transplant. The recipient was a 39-year-old man with hepatic cirrhosis and chronic renal failure. Five weeks after the surgery, the patient is now recovering at home (Anónimo, 2025).

ΠΕΡΙΛΗΨΗ

Τα Πρώτα Βήματα των Νεφρικών Μεταμοσχεύσεων στο Μεξικό

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Μετά τις πρώτες επιτυχημένες μεταμοσχεύσεις νεφρού που πραγματοποιήθηκαν από τους Joseph Murray και John Merrill το 1954, Μεξικανοί ιατροί και ερευνητές ξεκίνησαν τη δική τους πορεία στον τομέα. Παρακινούμενοι από τις εξελίξεις στο εξωτερικό, επιδόθηκαν σε θεωρητική μελέτη, εργαστηριακή έρευνα και πειραματικές διαδικασίες. Το 1962, ο José Carlos Peña ίδρυσε το πρώτο πρόγραμμα χρόνιας αιμοκάθαρσης στο Μεξικό, στο Νοσοκομείο Hospital de Enfermedades de la Nutrición και ακολούθως ένα πρόγραμμα ενδοπεριτοναϊκής κάθαρσης. Την ίδια χρονιά, πραγματοποιήθηκε η πρώτη μεταμόσχευση νεφρού από ζώντα δότη στη χώρα, από τους Manuel Quijano Narezo και Federico Ortiz Quezada. Δύο χρόνια αργότερα, πραγματοποιήθηκε η πρώτη μεταμόσχευση σε ενήλικο ασθενή και το 1967 έλαβε χώρα η πρώτη μεταμόσχευση με πτωματικό δότη. Ένα επίσημο πρόγραμμα μεταμόσχευσης νεφρού ιδρύθηκε τελικά το 1975 στο Μεξικανικό Ινστιτούτο Κοινωνικής Ασφάλισης (IMSS).

Λέξεις Κλειδιά: *Μεταμόσχευση νεφρού, αιμοκάθαρση, ιστορία της ιατρικής, Μεξικό*

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Kírikos Herétis - A Greek Physician and Scholar of the European Enlightenment

Androniki Chrysafi[1], Marios Marselos[2]

Abstract

Kírikos Herétis (*Κήρυκος Χαιρέτης*) (1756-1830) studied Medicine in Padua, at the end of the 18th century. His Dissertation entitled "*Manual on the economy of animals - The vital functions in humans and other living creatures*" concerned the function of the respiratory, digestive and cardiovascular systems, and it is considered the first book on Physiology in the Greek language. Herétis' belief that water is the best remedy, originates from Hippocratic texts and from Friedrich Hoffmann's Dissertation, highlighting a shift toward minimal pharmacotherapy and the use of natural therapeutic means. Moreover, the Hippocratic emphasis on the interaction between the natural environment and the physical and spiritual development of humans can be detected also in the writings of Herétis, as well as of his great-grandson, Pericles Yannópoulos, an intellectual and writer at the turn of the 20th century. The Dissertation of Herétis is an interesting synthesis of Hippocratic and Platonic philosophic views. The Platonic duality "Decay-Genesis" from the dialogue "Timaeus" contrasts with Hippocratic-Anaxagorean notions of humoral balance, while emphasising blood's primacy over other bodily humors. By merging classical traditions with contemporary medical thought, Herétis exemplifies the scientific trends of the European Enlightenment, advocating water as a universal remedy, with the claim that it improves blood fluidity.

Key Words: *Enlightenment medicine, Hippocratic tradition, Platonic philosophy, Kírikos Herétis*

Introduction

Kírikos Herétis (*Κήρυκος Χαιρέτης*) was born in 1756 in the village of Agios Thomas, Heraklion, Crete. The Herétis family has Byzantine origins, with documented traces in Constantinople as early as the beginning of the 13th century. His father, Astrinós Herétis, passed away at a relatively young age, and the care of his children was taken over by his brother, the physician-philosopher Dimitrios Herétis. Dimitrios sent young Kírikos to Mount Athos, where he studied for eight years at the *Athonias School*. Later, he moved to Venice, where he learned Italian and worked on editing books for publication. In 1793, he enrolled in the Medical School of Padua, from which he graduated in 1797.

Kírikos was married at the Church of St. George in Venice on August 1, 1798, to Countess Anna Marconi, aged 22, an Orthodox Christian of Greek lineage, originally from Crete, as himself. Kírikos and Anna had a large family with seven children.[1]

In 1800, Kírikos Herétis moved to Constantinople, where he practiced medicine successfully. Notably, in 1811, Sultan Mahmud II appointed him as his personal physician after Herétis cured him of a persistent eye infection. However, in 1824, Herétis was accused of being a member of the "Filikí Etería", a secret organisation preparing the Greek revolution, and was sentenced to death. Despite the Sultan's assurances that he would not be executed, the stress of his confinement led him to suffer a severe stroke from which he never recovered. He died on July 22, 1830, at the age of 74.

Kírikos Herétis was a multifaceted figure of the Greek Enlightenment, who engaged in editing, publishing, and writing medical, philosophical, and patriotic texts. He was proficient in Greek, Turkish, Latin, Italian, and French. However, his most significant work is the study he conducted immediately after graduating from the Medical School of Padua, a Dissertation titled "Manual on the economy of animals - The vital functions in humans and other living creatures" [*Εγχειρίδιον*

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τῆς τῶν ζώων οἰκονομίας, τοὐτέστιν ἡ περί ἀνθρώπους καὶ περὶ τὰ ἄλογα ζῶα αἰτία τοῦ ζῆν], hereafter referred to simply as the "Manual".[2] This work is an attempt to interpret the preservation of life in higher organisms as a result of the combined functions of the respiratory, digestive, and circulatory systems. Karaberopoulos described it as the first Greek book on Physiology.[3] In 2002, Detorakis published a related study[4], including a complete facsimile edition of the Manual, thereby facilitating scholarly access to the text, since only a limited number of original copies have survived.[5]

During the time Kírikos Herétis studied at the renowned Medical School of Padua, medicine was undergoing significant transformation due to advances in Mathematics, Physics, and Chemistry. It is worth noting that by around 1770, the Englishman Joseph Priestley (1733-1804) and the Swede Carl Wilhelm Scheele (1742-1786), working independently, had isolated in gaseous form an unknown chemical element. The French Antoine-Laurent de Lavoisier (1743-1794) named this new element "oxygen" and understood its chemical and biological action by studying the phenomena of fermentation and respiration.[6]

Physiology emerged as an independent scientific field in the early 19th century, when the macroscopic and microscopic structure of the human body was still almost fully known. This anatomical knowledge provided the foundation for a more systematic comprehension of physiological functions. In Germany, Physiology was established as a distinct science under the guidance of Johannes Müller, who was a professor in Bonn and later at the University of Berlin. Through his studies and inspired teaching, he laid the groundwork for this new scientific field and established it with his "Handbuch der Physiologie des Menschen" (Handbook of Human Physiology), published in the 1830s. Herétis studied and wrote his "Manual" during this transitional period. His work could be considered an early Physiology book, as its contents indeed concern the basic functions of the human body.

The author mentions in the Introduction that his manuscript had been read by the brothers Ioannis-Baptist Harvouris[7] and Markos Harvouris[8], as well as by Vincenzo Malacarne[9], who encouraged him to have it printed and translated into Italian ("Manual", p. 9).[10] Had this occurred, the "Manual" could have had a broader impact on the scientific community of the time.

Herétis describes the anatomy and function of the respiratory, digestive, and circulatory systems, leading to an extensive description of the beneficial effects of water, primarily for maintaining the fluidity of blood.

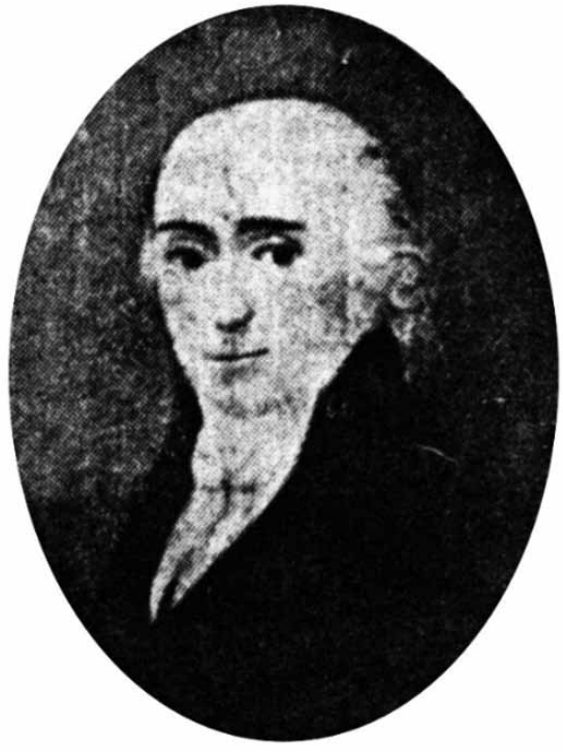

Figure 1. A portrait of Kírikos Herétis painted in Venice by Andreas Gradenigos.

ΕΓΧΕΙΡΙΔΙΟΝ
ΤΗΣ ΤΩΝ ΖΩΩΝ ΟΙΚΟΝΟΜΙΑΣ,
Τουτέστι ἡ περὶ
ΑΝΘΡΩΠΟΥΣ,
Καὶ Περὶ
ΤΑ ΑΛΟΓΑ ΖΩΑ ΑΙΤΙΑ ΤΟΥ ΖΗΝ,
Ποιηθεὶ παρὰ τοῦ Ἐξοχωτάτου
ΙΑΤΡΟΦΙΛΟΣΟΦΟΥ ΚΡΙΤΟΥ
ΚΗΡΥΚΟΥ ΧΑΙΡΕΤΟΥ
ΤΟΥ ΚΡΗΤΟΣ.
ΕΝΕΤΙΗΣΙ. 1798.
Ἐν τῇ Τυπογραφίᾳ τοῦ τοπ Δημητρίου Θεοδοσίου,
Νῦν δὲ Παιδὸς Θεοδοσίου τοῦ ἐξ Ἰωαννίνων.
CON LICENZA DE' SUPERIORI.

Figure 2. The first page of the dissertation of Kírikos Herétis (original edition, in the Library of the Ioannina University).

He also proposes the use of cold water for treating asthma, providing his personal therapeutic experience.

The perspective of the "Manual" is primarily based on the dual concept of *Decay* and *Genesis*, as a result of the functions of respiration and digestion: *All bodies under the moon undergo change and renewal. Genesis and decay are two successive governors of the creatures on earth. Whatever decay hastens to bring into nonexistence, genesis reshapes. And whatever genesis excessively advances, decay removes. A living being, whether rational or irrational, approaches death daily through decay, and at the same time returns to life through genesis* (pp. 11-12).

The author also recognises the great importance of inhaled air: *Air is essential to the life of every living being, rational or irrational, for it cools the blood excessively heated by movement*" (p. 13). It is noteworthy that while Herétis adequately describes the function of the lungs and heart, he makes no reference to oxygen. According to him, the role of blood circulation is to transport nutrients from the digestive tract to the tissues, while respiration serves to regulate body temperature, as blood cools down by passing through the lungs.

Elements of Hippocratic Medicine

Many passages in Herétis' "Manual" refer to the bodily humors and their qualitative properties as factors of health or illness. A significant portion of the text is dedicated to water, which he considers absolutely necessary for maintaining the fluidity of blood, ensuring better circulation and renewing bodily humors. Additionally, he describes therapeutic treatments based on the principles of purification, such as bloodletting and administration of purgatives. These practices were not exceptions, but part of daily medical routine, showing that in the late 18th century medicine still adhered to many of the Hippocratic principles. At the same time, Herétis demonstrates extensive knowledge of the medical advancements of his time, frequently citing works of other physicians not only from Italy but also from other countries.

In Chapter One (*On Respiration*), we read: *Anything that alters the purity, warmth, or coldness of the air in any way renders it harmful. Excessively warm air disperses the watery parts of the blood, increases bile, dries and thickens the humors, leading to choleric fevers, inflammations, and similar ailments. Excessively cold air hinders invisible transpiration, hardens the solid parts of the body, and freezes the fluids, resulting in rheumatisms, catarrhs, and related conditions. Excessively humid air deteriorates the elasticity of the solid parts, leaving the body in a weakened and phlegmatic state, predisposing it to intermittent fevers, dropsy, and other ailments* (pp. 22-23).

He also highlights the importance of air quality for human health and warns of the public health dangers posed by the polluted air of densely populated cities: *Not only because the same air is breathed by many individuals repeatedly, but also because it is burdened with sulphurous particles, smoke, and various fumes* (p. 23).

In Chapter Two (*On Digestion*), he explains: *Thirst arises from irritation of the membrane that lines the mouth, oesophagus, and stomach, due to a deficiency of fluids and the acridity of the humors, which causes a sensation of heat and dryness* (p. 25).

When one eats too little of various foods, or consumes foods of low nutritional value, or eats difficult-to-digest meals, the body's humors are not renewed, and thus, the body's strength gradually declines. […] Food is transformed into a material capable of generating blood, which is the source of all bodily humors and the only means by which the body restores its strength (p. 44).

In Chapter Three (*On Blood Circulation*), extensive reference is made to water as a regulatory factor of bodily functions, essential for maintaining health and preserving life itself. Herétis, in support of his arguments, invokes the views of Hippocrates and Galen (*The Great Father of Medicine Hippocrates and the Renowned Galen first define Water in relation to Fevers*) (p. 63)[11], as well as the opinions of Celsus and Avicenna, along with those of famous later physicians who also advocated for the therapeutic value of water, such as *Rondelet* [pp. 9,10], *the teacher Floyer* [pp. 11,12], the *renowned teacher Hancock* [p. 13], and *Cullen* [pp. 14-16].

A detailed reference is made to Friedrich Hoffmann[12] [pp. 17,18], whose views on water are cited: *[Hoffmann] asserts that one may justly call water a universal medicine; first, because it is suited to every temperament, every age, and every place. Second, because there is no better prophylactic against diseases than water itself. Third, because the relief and comfort it provides in both acute and chronic ailments are certainly assured. Fourth, because the use of water substitutes for the use of almost all medicines prescribed by physicians both for the preservation of health and the treatment of diseases* (pp. 61-62).

He concludes with the following statement: "*I leave it to the judgment of wise physicians to determine whether nature provides a remedy more suitable and effective than pure water for imparting such essential*

fluidity to the blood" (p. 63).

The topic of water is revisited in the conclusion of the "Manual": *Given all these, I certainly align myself with the opinion of the aforementioned renowned Dutch* (sic)[13] *medical teacher Mr. Hoffmann and advise all those who wish to preserve their health to make use of Water. The Father of Medicine Hippocrates himself states: "It is easier to be filled with drink than with food*" (pp. 66-67).[14] Furthermore, he continues: *Hippocrates defines a characteristic for distinguishing Good Water, saying that "Water that heats up and cools down quickly is the lightest"* (p. 67).[15]

Hippocratic influences are also evident in the everyday practice of medicine at the time when Kírikos Herétis began his studies in Padua in 1793. Specifically, he mentions that he suffered from asthmatic attacks and followed the instructions of his attending physician Andrea Comparetti[16], a faculty member of the Medical School at Padua (pp. 64-65).

In another part of the text, he provides a detailed account of the therapeutic treatment prescribed to him by Comparetti: *… previously, I was compelled to undergo bloodletting three or at least two times a year and to take continuous purgatives to avoid the danger of plethora* (p. 66). Considering that Comparetti was an active professor in Padua at that time, the described therapeutic regimen was evidently the prevailing and accepted scientific knowledge, which was taught to medical students. This knowledge directly refers to the Hippocratic principles of *bloodletting* and *purgation*, aimed at maintaining the balance of bodily humors.

As Herétis informs us, after following the treatment of purgatives and bloodletting for four years without success, he decided to consult Comparetti about a new treatment he discovered by chance when he came across *a small book written by an Englishman called Smith*[17], which described *almost miraculous results from the use of Water, among which I saw accounts, supported by various testimonies, that many asthmatics were cured solely by the use of Cold Water* (p. 65).

Since Comparetti stated that he knew Smith and considered him *a worthy writer of great repute*, Herétis abandoned his previous treatment and admits that he began making *not just use, but excessive use of extremely cold water, so much so that many of my friends told me I would become dropsical* (p. 66). In fact, due to the positive effects he experienced from daily consumption of cold water, he recommended the same treatment to another patient suffering from asthma, who showed remarkable improvement in appearance and nourishment.

Environmental factors – A lore in Herétis' family

The extensive and frequent references of Herétis to the quality of inhaled air and the properties of drinking water demonstrate that he recognised the importance of the environment in maintaining human health. Herétis' description of the qualitative characteristics of healthy air and water closely resembles the content of Hippocrates' work "On Airs, Places, Waters". Even more so, Hippocrates emphasises the decisive role of the overall natural environment in health and in the mental and spiritual state of humans: *One will generally find that human appearances and customs follow the characteristics of their land. Where the land is rich, soft, and moist, and where the waters are highly variable —warm in summer and cold in winter, with well-defined seasons— the people will be fleshy, unarticulated, and moist in constitution. They will also tend to be lazy, lacking endurance, and generally weak in spirit. They will exhibit sluggishness and drowsiness and will be slow and dull in the arts. In contrast, where the land is barren, rugged, and exposed to extreme winter cold and summer heat, the people will be hard, lean, well-articulated, strong, and hairy. They will be naturally industrious, sharp, wakeful, and self-willed, showing more of a wild nature than a tame one. In the arts, they will be more intelligent and perceptive and will excel in warfare. All other living things in such a land will follow similar characteristics. Such are the most opposite types of natural constitutions and bodily forms. By understanding these principles, one can infer similar observations about other regions without error.*[18]

Among the papers found in the archive of Herétis' family in Patras, there was a hand-written text attributed to Kírikos Herétis, with the following content: *Greece, with its mild and temperate climate under its serene sky, was designated by nature as the first altar of the graces. To the well-governed freedom, the most inventive spirit, and the most brilliant imagination of the Greeks belonged the glory of founding and perfecting all the fine arts… The noble and cultivated spirit of our ancestors still lives and will continue to live.*[19] In this brief paragraph, Herétis praises the spiritual and artistic virtues of Greeks as a result of an extremely favourable natural environment. Compared to the afore-mentioned text of Hippocrates, one can easily recognise a common deterministic background.

At this point, it is worth noting that similar ideas were expressed later by Herétis' great-grandson[20], the Greek intellectual and writer Pericles Yannópoulos (1869-1910): *By studying the land and analysing our-*

selves, we see that all beauty and nobility present in the land also exist within us. Similarly formed, of the same essence, we manifest the same characteristics. Everywhere there is order, symmetry, harmony; everywhere there is elegance, Odyssean resourcefulness, and youthful grace; everywhere there is gentleness, charm, and cheerfulness; everywhere there is a playful wisdom, a humorous disposition, and a Socratic irony.[21,22]

Discussion and Conclusions

As a young physician, Kírikos Herétis experienced the cultural changes fostered by the European Enlightenment - a period characterised by the pursuit of new knowledge, though it had not yet fully cast off the traditional principles of Hippocratic medicine. He was eager to learn and adopt new ideas and therapeutic methods, as he stayed informed about the latest trends in his field through the works of renowned physicians of the time, such as Cullen[23], Floyer[24], Rondelet[25], Smith[17], Hanckoke[26] and Hoffmann[12,13,27].

During the time Kírikos Herétis studied in Padua, in the late 18th century, the level of knowledge regarding the anatomy and physiology of the respiratory, digestive, and circulatory systems was quite advanced. A particularly striking aspect is the description of the nutrient absorption within the digestive tract, especially with regard to details concerning chylomicrons and their entry into venous blood through the thoracic duct (pp. 41-42). It is well known that the anatomy and function of the lymphatic system remained a challenging field of study even into the 20th century, due to the delicate structure of lymphatic vessels. Equally impressive is the level of knowledge concerning foetal blood circulation and the description of the gradual closure of the *ductus arteriosus* after birth (pp. 59-60).

It must be noted that despite the adherence of many physicians to the principles of Hippocrates and Galen, the 17th and 18th centuries saw a growing tendency to challenge classical medical texts. Friedrich Hoffmann (1660-1742) believed that the body possessed reserves for self-recovery, which could be supported without the excessive use of medications. This view could be considered "Hippocratic", given that Hippocrates himself was very sparing in the use of drugs, as demonstrated by the books considered his authentic works.[28] Moreover, a similar statement is found in the Hippocratic collection: *Nature is the physician of diseases. Nature finds the means of healing on its own, without difficulty...* (Epidemics VI, 5th, 1, p. 314).

Similarly to Hoffmann, the Scottish physician John Brown (1735-1788) introduced "modern" ideas that gained a great reputation as the "Brunonian system of medicine", even in Continental Europe.[29] According to Brown, the treatment of any patient could be achieved with minimal medication, depending on whether their ailment was "asthenic" or "sthenic". Diseases of an asthenic nature should be treated with a "stimulant" like alcohol[30], whereas sthenic diseases required a sedative drug like opium. In essence, Brown suggested that only two drugs would suffice for practicing medicine.

Judging by the enthusiasm with which Herétis, adopting Hoffmann's views, advocates for water as a near-universal remedy, it can be inferred that he was influenced by the medical views of his time, which did not favour any longer the extensive and complex pharmacotherapy found in Galen's texts. This trend reached its peak a few years later, when the German physician Samuel Hahnemann (1755-1843) formulated the principles of "homeopathic medicine", proposing not only fewer medications but also infinitesimal doses.[31] On the other hand, Herétis' view that water is essential in the human body - because it maintains the fluidity of the blood - reflects the overall Cartesian perception of the time, which likens the human body to a complex mechanical system of levers and pulleys. In this system, solid organs hold an important position, according to the principles of "solidism" introduced by Herman Boerhaave (1668–1738)[32], as well as the force of blood circulation, which sustains the body's function in the same way a watermill operates through the force of water.[33]

Finally, it is of interest to point out that the "Manual" contains some elements of Platonic philosophy. The most characteristic of these is the duality of "Decay - Genesis", which is encountered already in the introduction of the book and constitutes Herétis' main line of reasoning, in describing the function of the human body. The dialogue "Timaeus" represents the quintessence of Plato's natural philosophy, as it brings together his views on the functioning of the human body as part of the universe. In this dialogue, the physiological and pathophysiological conditions of the human body are interpreted through the dual concept of "Decay - Genesis", which is completely absent in *Corpus Hippocraticum*. In fact, Hippocratic physicians had adopted the doctrine of Anaxagoras (c 500-428 BC), according to which *nothing comes into being or perishes, but rather, it is composed and separated from pre-existing elements in nature* (Anaxagoras, fragment 17). That is, things do not emerge

from nothing nor disappear completely, but rather change form. According to Anaxagoras, instead of speaking of "genesis" and "decay", it would be more accurate to refer to "mixing" and "separating", because the fundamental elements of nature are not lost but they change from one state to another. Indeed, the Hippocratic view of health is the result of a symmetrical mixture of humors: *Thus, absolutely nothing is lost, and nothing is born that did not exist before; changes occur through mixing and division… but everything increases and decreases to the greatest possible or the least possible extent* (On Diet I, 4).

Another point of similarity between Plato's "Timaeus" and Herétis' "Manual" is the fact that both books emphasise the significant role of blood, whereas the other humors of the human body (phlegm, yellow bile, black bile) are considered harmful by-products of decay that must be expelled from the body.

As has already become clear, the medical issues addressed in Plato's works sometimes converge and sometimes diverge from the fundamental principles of Hippocratic medicine. However, "Timaeus" in particular stands out for its theoretical breadth, which, to some extent, justifies the impact this Platonic dialogue had on Western civilization. A crucial factor was the compatibility of key theories in "Timaeus" with fundamental Christian beliefs, such as the existence of a "benevolent Creator of the world" and the "immortality of the soul". Notably, this dialogue was translated into Latin as early as the 4th century AD, making it the only known Platonic work in the West at the time, whereas most other ancient Greek texts were translated after the 11th century.[34]

A comparison between "Timaeus" and the "Manual" leads to the conclusion that Plato's philosophical ideas enjoyed a significant penetration into Italian culture at a very early stage, so that they even influenced the development of medical concepts. Therefore, it is not surprising that alongside Hippocratic ideas and principles, we also encounter views reflecting Plato's natural philosophy, even in a text as late as that of Herétis.

Another significant issue is the influence of the ideas of ancient medicine and philosophy on modern Greek literary movements, exemplified by the writings of Pericles Yannópoulos, Herétis' great-grandson. Yannópoulos was an essayist and active follower of aestheticism at the turn of the 19th to the 20th century, a period marked by the ascendancy of the movement known as "geoclimatic nationalism". This theory emphasises the natural interaction between environment and humans, shaping not only their physical characteristics but also their psychological disposition and cultural achievements. In his powerful aesthetic essays on Greek art - "Modern Painting" (Η Σύγχρονος Ζωγραφική, 1902)[35], "The Greek Line" (Η Ελληνική Γραμμή,1903)[36], and "The Greek Color" (Το Ελληνικόν Χρώμα, 1904)[37] - the environment is endowed with "metaphysical properties of social determination, strengthening the Greek spirit and leading the Greeks to a poetic, ecstatic journey towards perfection".

In accordance to Herétis' description of the importance of clean and temperate air for human health and Hippocrates' emphasis on the decisive role of the natural environment in health and the mental and spiritual state of humans, Yannópoulos condemns the unhealthy European atmosphere of 1903: "Every house burns coke, every human body burns alcohol", characterising Europeans as "barbaric by nature", with "souls filled with images of misty landscapes and smoky cities".[38] This stands in contrast to the bright and temperate Greece, where "Everything plays; everything prospers; everything showers hope; everything sprinkles joy; every eye that opens receives a drop of happiness. All is Light. All is Joy. All is Pleasure. All is Delight".[39] Along the same lines, Yannópoulos coined the emblematic phrase "Life in Greece is an outdoor life".[40] Living outdoors is "a structural component of mental and physical health, as well as a spiritual balance of the inhabitants of the Greek peninsula, from antiquity to the modern era".

Yannópoulos interacted with and influenced the intellectuals of his time, leaving a profound imprint on 20th-century Greek thought, arguably intensified by his dramatic - almost theatrical - suicide at a seaside location near Athens in 1910. While he had an impact on Greek landscape painters, his most enduring influence was on the writers of the so-called "Generation of the 1930s", who introduced the modernist movement in Greek literature. Yannópoulos' geopolitical views offered a theoretical tool to the "Generation of the 1930s" for the redefinition of national identity and the concept of "Hellenikotita" (Greekness), after the catastrophic Greco-Turkish War of 1922 and the deportation of the Greek inhabitants of Asia Minor.

In conclusion, Herétis' "Manual" is an interesting text on human physiology of the Greek Enlightenment, where Hippocratic and Platonic ideas and theories are merged harmoniously. Moreover, Herétis follows the prevailing views of his contemporary colleagues in Italy and other counties, advocating for water as an important and unique remedy for the human body.

ΠΕΡΙΛΗΨΗ

Κήρυκος Χαιρέτης - Ένας Έλληνας Ιατρός και Λόγιος του Ευρωπαϊκού Διαφωτισμού

Ανδρονίκη Χρυσάφη, Μάριος Μαρσέλος

Ο Κήρυκος Χαιρέτης (1756-1830) σπούδασε Ιατρική στην Πάδοβα, στα τέλη του 18ου αιώνα. Η διατριβή του, γραμμένη στα ελληνικά, αφορούσε τη φυσιολογία του ανθρώπινου σώματος, με έμφαση στη λειτουργία του αναπνευστικού, του πεπτικού και του καρδιαγγειακού συστήματος (*Ἐγχειρίδιον τῆς τῶν ζώων οἰκονομίας, τοὐτέστιν ἡ περί ἀνθρώπους καὶ περὶ τὰ ἄλογα ζῶα αἰτία τοῦ ζῆν*). Το έργο του Χαιρέτη αντικατοπτρίζει τις προχωρημένες ιατρικές γνώσεις της εποχής του, ιδιαίτερα στην ανατομία και τη φυσιολογία του ανθρώπινου σώματος. Υποστηρίζει τη χρήση του νερού ως θεραπευτικού μέσου, στηριζόμενος στα Ιπποκρατικά κείμενα αλλά και στη διατριβή του Friedrich Hoffmann. Επιπλέον, η Ιπποκρατική έμφαση στην αλληλεπίδραση μεταξύ του φυσικού περιβάλλοντος και της σωματικής και πνευματικής ανάπτυξης του ανθρώπου είναι εμφανής τόσο στα γραπτά του ίδιου του Χαιρέτη όσο και σε εκείνα του δισέγγονου του, Περικλή Γιαννόπουλου, ενός διανοούμενου αισθητιστή των αρχών του 20ού αιώνα. Η διατριβή του Χαιρέτη αποτελεί μια ενδιαφέρουσα σύνθεση των απόψεων του Ιπποκράτη και του Πλάτωνα. Ο Χαιρέτης ασπάζεται την πλατωνική δυαδική αντίθεση «Φθορά-Γένεσις», σύμφωνα με τον διάλογο «Τίμαιος», όπου το αίμα έχει πρωταρχικό ρόλο στον οργανισμό, ενώ οι υπόλοιποι χυμοί αποτελούν προϊόντα φθοράς και σήψης. Η άποψη αυτή αντιπαραβάλλεται με το αξίωμα του Αναξαγόρα και του Ιπποκράτη ότι τα βασικά δομικά στοιχεία του ανθρώπινου σώματος μπορεί να μεταβάλλονται αλλά δεν χάνονται. Συνδυάζοντας τις κλασικές παραδόσεις με την ιατρική σκέψη της εποχής του, ο Χαιρέτης εκφράζει τις επιστημονικές τάσεις του Ευρωπαϊκού Διαφωτισμού και προβάλλει το νερό ως ένα χρήσιμο φάρμακο, το οποίο βελτιώνει τη ρευστότητα του αίματος.

Λέξεις Κλειδιά: *Ιατρική του Διαφωτισμού, Ιπποκρατική παράδοση, Πλατωνική φιλοσοφία, Κήρυκος Χαιρέτης*

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his studies at the University of Padua in Philosophy and Medicine, graduating as a Doctor of Medicine on July 14, 1757. He then specialized in Natural Sciences and particularly Chemistry at the University of Bologna. The Venetian Republic awarded him the title of Count in 1760.

9. Malacarne, Vincenzo (1744-1816), Italian professor of Medicine, Surgery, and Obstetrics in Turin, Pavia, and Padua. He represented the "cultivated" scientist of the eighteenth century, combining humanities, medicine, and politics. His contribution was significant in Anatomy, Surgery, Obstetrics, and Neurology. He made the first comprehensive description of the human cerebellum.
10. The page numbers for the excerpts from Kírikos Herétis' "Manual" refer to the original Venetian edition of 1798.
11. *Ὁ Μέγας Πατὴρ τῆς Ἰατρικῆς Ἱπποκράτης καὶ ὁ Περίφημος Γαληνὸς τὸ Ὕδωρ κατὰ πρῶτον διορίζουσιν εἰς τοὺς Πυρετοὺς* (σ. 63).
12. Herétis knew apparently the works of Friedrich Hoffmann (1660-1742) and especially his Dissertation in the University of Halle in Wittenberg, which was published in 1712 with the title "*De acqua medicina universali*" [Water as a universal remedy].
13. Friedrich Hoffmann (1660–1742) was a German physician. He was born in Halle, in what is now Germany, and was a prominent professor of medicine at the University of Halle (Wittenberg). For some reason, Herétis mentions him as a Dutch physician.
14. Littré E. "Hippocrates. Opera Omnia". Vol. I–X. Paris, 1839–1861. Vol. IV. Aphorisms, 2nd. 11. p. 472: "*Ῥᾷον πληροῦσθαι ποτοῦ ἢ σιτίου".*
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The Interplay Between Philosophy and Medicine: Plato and Aristotle

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Abstract

This paper explores the convergence of philosophy and medicine in Ancient Greece, focusing on the influences of Plato and Aristotle on medical thought and practice. Rooted in the socio-economic transformations of the fifth-century BCE Athenian "golden age", this period marked a transition from mythological explanations of health to empirical, observation-based medicine. Socrates' personae, as portrayed by Plato, played a role in shifting thought from speculative ideas to rational inquiry, laying a foundation for the Hippocratic Corpus. The study examines how Hippocratic principles shaped both Plato's and Aristotle's philosophical frameworks, focusing on the empirical and ethical principles these thinkers integrated into their understanding of health and the human body.

Using literature review, textual analysis, and comparative evaluation, this paper highlights the philosophical overlap in medical thought across Plato and Aristotle and how their thoughts still influence current medical practice. For Plato, medicine served as an ethical and practical science grounded in rational inquiry, and his works such as Gorgias and Phaedrus reflect the view that medicine, like philosophy, seeks truth and moral purpose. He advocated for medicine as a "perfect art", valuing both individual health and the ethical governance of society. Aristotle, influenced by his medical lineage, advanced a more empirical approach, distinguishing between types of bodily motion and introducing early anatomical classification in his studies of homogeneous and heterogeneous body parts. He emphasised that medicine must aim at human flourishing (eudaimonia) through balanced, adaptable care, with compassion and ethical responsibility central to medical practice.

This paper argues that Hippocratic ideas on natural causation, observation, and patient-centred ethics significantly shaped both philosophers. Their works established fundamental principles for Western medicine, bridging empirical observation with moral philosophy and creating a framework within which modern medicine continues to operate, grounded in scientific inquiry, ethical integrity, patient autonomy and holistic care.

Key Words: *Medicine, ancient philosophy, history of philosophy, Plato, Aristotle*

Introduction

The development of rational thought in Ancient Greece, transitioning from mythological to empirical approaches, is closely intertwined with socio-economic transformations that influenced scientific and intellectual pursuits. The fifth century BC, marked by the "golden age" of the Athenian Republic, witnessed foundational shifts in scientific thinking and methodology. This period laid the groundwork for scientific inquiry in various disciplines, particularly medicine, which began distancing itself from mythological explanations and integrating observational, evidence-based practices[1].

Socrates (470–399 BC) personae, given to future researchers by Plato, and others[2], exemplified this intellectual progression. His innovative "midwifery method" (maieutics) engaged his interlocutors in discovering knowledge within themselves, moving philosophy towards a process grounded in dialogue and inquiry. His choice of the term 'midwife'[3] is

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significant, symbolising the connection between intellectual exploration and the emerging field of medicine. Socrates' influence catalysed the gradual shift from speculative theories to natural explanations of phenomena, positing that an expert in intellectual dialogue who works through induction and formulation of definitions creates a stable interpretation for all human actions[4]. This approach eventually laid the groundwork for the Hippocratic Corpus, a seminal body of texts outlining scientific principles for diagnosing and treating diseases while discarding supernatural interpretations. Medicine was thus gradually separated from archaic knowledge through research for 'reasons why this is'[5].

This article examines the synergy between philosophy and medicine in Ancient Greece by focusing on two key philosophers, Plato and Aristotle, to reveal how their philosophical inquiries established ethical and empirical foundations in medical practice. Through a study of these thinkers, we explore how Ancient Greek philosophy shaped the methods and values that still inform the ethical and empirical frameworks of contemporary medicine.

Method

The article employs a methodology rooted in literature review, textual analysis of primary sources, and comparative evaluation.

Literature Review: This study begins with a comprehensive literature review of works by Plato and Aristotle and of broader texts on the sociohistorical context in which they lived. Each text is examined for its portrayal of medical ethics, diagnostic principles, and the nature of the soul-body relationship.

Textual Analysis: Through close readings of texts, we identify key themes where philosophical inquiry overlaps with medical practice. Their analysis clarifies how these thinkers' works contributed to the ethical and empirical frameworks that structured ancient medical practices and led to the philosophical foundations of modern medicine.

Comparative Evaluation: We engage in a comparative analysis, evaluating the similarities and differences in the views of Plato and Aristotle on medicine. We explore how each thinker approached the role of observation, natural causation, and ethical obligations within medical practice. By comparing these perspectives, we outline their contribution to the progression from speculative to empirical methodologies and the evolving emphasis on patient welfare and moral responsibility.

The revolution of Hippocratic Medicine

Ancient Greek medicine underwent a gradual transformation, culminating with the work of Hippocrates and his followers. They established a comprehensive medical approach that relied on natural explanations for diseases and rejected religious and supernatural causation[6]. The Hippocratic Corpus, a collection of 53 works encompassing clinical observations, diagnostic methods, and treatments, emerged as a cornerstone of this new rational approach to healthcare.

Central to the Hippocratic school of thought were three principles:

Natural Explanations for Disease: Disease was no longer seen as punishment from the gods but as a natural phenomenon, thereby enabling objective diagnostic methods[7].

Observational Diagnosis: Physicians studied patients through observation, listening, and physical examination, which represented a departure from speculative interpretations[8].

Avoidance of Theocratic Medicine: In contrast to theocratic approaches, Hippocratic practitioners supported the body's natural ability to heal, focusing on strengthening and correcting the body's defences[9].

Hippocrates (c. 460-375 BCE), slightly older than Plato (428-348 BCE) and preceding Aristotle (384-322 BCE), influenced both philosophers with his ideas on medicine and natural causation. As they developed their philosophical frameworks, Plato and Aristotle drew on Hippocratic principles, integrating his empirical methods and ethical approach to health into their own thinking. Hippocratic thought provided an early model of rational, empirical medicine and introduced ethical guidelines that would shape their perspectives on health, science, and ethics[10].

Hippocratic influence on Plato

Plato, building on universal principles and Empedocles' doctrine of the four elements, incorporates this theory into his understanding of the medical art, which he references across dialogues such as *Gorgias*[11], *Phaedrus*[12], *Charmides*[13], and *Theaetetus*[14]. Of these, *Gorgias*[15] and *Phaedrus*[16] most directly address his views on medicine, revealing how Plato's moral philosophy connects health, ethics, and society.

In *Gorgias*[17], Plato critiques various disciplines by examining their status as sciences and asserts that true arts, particularly medicine, - unlike rhetoric - validate their scientific status by grounding their doctrines in reason. Medicine thus stands as a genuine science of health and disease - a "perfect art"[18], aligned with

rational inquiry and ethical purpose – in contrast with fields based on fame or faith, which Plato views as subordinate to the more precise logic of dialectic. Medicine, with its well-defined objective, purpose, and scientifically rigorous methodology, embodies this "real science", a notion further explored in *Charmides*[19], where reason-based disciplines are seen as superior to subjective pursuits.

Plato describes the ideal mode of knowledge, particularly in the context of statecraft, as one where understanding and reasoning are proportionate to the truth they reflect. He believes that the diversity within forms of governance mirrors this diversity in knowledge, where each faculty of understanding must match the clarity of its subject matter, akin to Hippocratic medicine's approach to diagnosing and treating the body. In this encounter with rhetoric, Plato underscores that the art of Hippocratic medicine involves acknowledging the limitations of words alone in addressing health.

In *Gorgias*, this idea manifests as a rejection of rhetoric as a primary tool for health, while in *Phaedrus*, it evolves into an endorsement, suggesting that well-guided rhetoric can support holistic well-being[20] in a framework in which medical knowledge and moral philosophy should work together to support personal and societal well-being. This reflects Hippocratic influence, where medicine is both a practical science and a moral discipline, dedicated to holistic health. For Plato, true knowledge - including medical knowledge - should focus on both the health of the individual and the ethical structure of society.

In *The Republic*[21] and *Laws*[22], Plato extends this perspective to politics, where he discusses the ethical dimension of law and medicine. Here, he suggests that laws should operate like medical treatments: as tools that balance coercion with guidance and respect for individual autonomy. Just as medicine serves the body with a sense of ethical duty, so laws should serve the state, promoting principles of patient (or citizen) autonomy and informed consent.

This ethical framework is later echoed by Aristotle in his *Nicomachean Ethics*[23], where he builds upon Plato's principles, advocating for a compassionate and morally accountable approach in both politics and medicine.

Hippocratic influence on Aristotle

Aristotle believed that motion differed between living and non-living things, as inanimate objects move only when acted upon, while animate beings can initiate movement independently. Heat and cold (exterior or interior), for example, create motion[24]. He classified movements into voluntary, involuntary, and automatic: voluntary movements arise from an individual's will, involuntary ones happen in states like sleep, and automatic motions, such as internal organ function, occur without conscious thought[25].

Aristotle's early exposure to medicine began through his father, Nicomachus, a court physician to King Amyntas of Macedon and a member of the Asclepiad family - a lineage renowned for its medical knowledge, which later adopted the name Aristotelian. Their children were educated not only in literature but also in anatomy. This foundation led Aristotle to prioritise medicine as a cornerstone of rational inquiry, situating it between myth and emerging philosophical frameworks as part of the pursuit of scientific knowledge.

Aristotle, belonging to the Platonic school of thought, believed that medicine's foundational principles could be deduced from general philosophical principles. He contributed significantly to the establishment of scientific medicine, and his corpus of work - much of which intersects with themes in the Hippocratic Corpus[26] - explores various wellness topics. Aristotle also reflected on virtues, distinguishing between aesthetic virtues and moral virtues, the latter aimed at the happiness of the 'aristos'[27] (the noble or virtuous individual).

In his ethical framework, Aristotle defines moral virtues as qualities related to both actions and internal emotions, each accompanied by pleasure or pain[28]. Through this lens, virtue itself can be associated with the balance between pleasure and pain, a theme he explores extensively in his wo rks. Cicero later expanded on Aristotle's concept of ethos (character or moral disposition) in De Re Publica, translating these ideas into the Roman concept of *moralibus*.

Aristotle often used metaphors from medicine to illustrate his views on moral philosophy and citizenship. He argued that a doctor's reliability is not solely based on formal qualifications but grows through genuine engagement - by speaking with, listening to, and reasoning with patients and society. In his analogy between rhetoric and medicine, Aristotle highlighted the uncertainties within both fields, emphasising that a practitioner must skilfully adapt their methods to persuade or treat effectively[29].

For Aristotle, medicine's goal is to restore the patient's health as fully as possible, but where complete recovery is unattainable, treatment should aim to bring the patient to the best possible condition. He introduces the term *epieikeia* (equity) to describe the physician's

adaptive approach, considering the specific circumstances of each illness. In this way, a well-informed practitioner must use knowledge thoughtfully, avoiding missteps that might arise from relying on incomplete information or rigid formulas.

Aristotle's philosophy aligns with Pythagorean orthodoxy, particularly in his views on ethics within the arts. Drawing on Pythagorean principles, he asserts that 'bad' aligns with the 'infinite' and 'good' with the 'finite', thereby linking vice to excess and deficiency, while virtue lies in moderation. This concept is central to Aristotle's virtue ethics, which emphasises cultivating balanced personality traits to encourage virtuous actions in both learners and practitioners. Aristotle believed this principle of moderation applies universally, guiding those in scientific and artistic pursuits as well as aspiring medical professionals to strive for a harmonious and ethical approach in their work[30].

Results

The integration of medical thought appears early in Plato's (428–347 BCE) work and even more prominently in Aristotle's (384–322 BCE) philosophy. In *Alcibiades*[31], Plato conveys his belief that the human being comprises a celestial, immortal soul that uses the body it is trapped in as a tool for acquiring knowledge. This dualism establishes the body as separate from the soul, which Plato describes as longing to reconnect with a realm of pure, eternal ideas - a concept developed further in *Phaedrus*[32]. This perspective on the soul and body influences his broader views on health, where the state of the soul reflects and affects physical well-being.

Aristotle also acknowledges the divinity of the soul but diverges from Plato regarding its nature[33]. He proposes that the soul is the "entelechy," or actualising force, of the body's potential for life, making it inseparable from physical form[34]. For Aristotle, an ideal human integrates seamlessly into nature, embodying both 'potential' and 'actual' states. This integration shapes his approach to medicine, where he introduces the early concepts of histology, categorising body parts into *homogeneous* (e.g., flesh, bones, blood) and *heterogeneous* (e.g., hand, foot, face) elements, emphasising that each structure has a unique function within the body's overall composition[35].

Aristotle's approach to medical philosophy involves what he terms "three degrees of composition", which classify body structures based on their form and function. This model laid foundational principles for medical science, as it provided a framework for studying the body through observation and categorisation.

Discussion

Doctors should consider various individual factors in patient care starting with these foundational concepts. Modern medicine has moved away from outdated beliefs, seeking to understand underlying causes through research and experimentation[36]. Speculative ideas of ancient medicine have been replaced by theories that are testable, forming the basis for accurate diagnosis, prognosis, and treatment. Additionally, clinical studies play a critical role in advancing research and refining conclusions about diseases[37]. Since the human body has intrinsic healing capabilities, the physician's role is to support and strengthen these natural defences, guiding the body toward recovery[38].

In ancient Greece, and later in the Roman era, medicine was initially regarded as a divine gift, enjoyed by many demigod heroes known for their extraordinary healing powers. However, the transition from mythological to scientific explanations for health and illness is closely linked to broader socio-economic changes. The economic expansion that accompanied Greek colonisation, especially in areas like Magna Graecia and through increased trade, transformed governance structures and promoted democratic values. As societies became more democratic, their approach to understanding the world and human behaviour grew increasingly rational. This shift, particularly during the fifth century BCE in the Athenian Republic's "golden age," marked a significant advancement in medical knowledge and education, as medicine began adopting scientific methods.

Science has developed from ancient knowledge by deepening our understanding of disease through innovative methods for exploring human nature[39]. This progression traces causal relationships from immediate symptoms back to their underlying origins, seeking the fundamental causes. Such an approach mirrors the thinking of pre-Socratic philosophers, who aimed to understand the origins of the world and natural phenomena. As a result, physicians of that era could focus medical thought on the natural causes of illness, moving away from supernatural explanations.

The simplistic views of ancient medicine, often rooted in religious beliefs, were gradually replaced by emerging theories - some verified, others speculative - about diseases, which laid the groundwork for systematic diagnosis and treatment. This transition from theoretical understanding to practical medical application advanced research, enabling physicians to

draw informed conclusions about various ailments[40]. Greek cosmology and science, while centred on human experience, were also profoundly intellectual, positing that the essence of research lies in the pursuit of knowledge rather than practical application alone. For physicians, science was seen as a means to serve a purpose beyond material gain, aimed at deeper understanding[41]. The intellectual currents of that period introduced universal values across disciplines, values that continue to resonate today.

Conclusion

The approaches of Plato and Aristotle demonstrate that a philosophy of medicine can significantly shape our understanding of the soul, body, and health. Plato's concept of medical thought, grounded in the relationship between body and soul, emphasises the treatment of illness while striving for truth and the highest ethical standards.

Aristotle adopts a more practical approach, recognising the interdependence of soul and body and focusing on the pursuit of human virtue and happiness as part of health.

Together, their ideas established foundational principles that influenced medical practitioners after Hippocrates, integrating philosophical thought with medicine and defining the ethical and intellectual boundaries within which medicine operates today.

ΠΕΡΙΛΗΨΗ

Η Αλληλεπίδραση μεταξύ της Φιλοσοφίας και της Ιατρικής: Πλάτων και Αριστοτέλης

Κωνσταντίνα Κωνσταντίνου

Το παρόν άρθρο διερευνά τη σύγκλιση μεταξύ φιλοσοφίας και ιατρικής στην Αρχαία Ελλάδα, εστιάζοντας στις επιρροές του Πλάτωνα και του Αριστοτέλη στην ιατρική σκέψη και πρακτική. Με ρίζες στους κοινωνικοοικονομικούς μετασχηματισμούς της αθηναϊκής «χρυσής εποχής» του 5ου αιώνα π.Χ. αυτή η περίοδος σηματοδότησε μια μετάβαση από τις μυθολογικές επεξηγήσεις της υγείας στην εμπειρική ιατρική που βασίζεται στην παρατήρηση. Η μορφή Σωκράτη, όπως απεικονίζεται από τον Πλάτωνα, έπαιξε ρόλο στη μετατόπιση της σκέψης από τις θεωρητικές ιδέες στην ορθολογική έρευνα, θέτοντας τα θεμέλια για την Ιπποκράτεια Συλλογή. Η μελέτη εξετάζει πώς οι ιπποκρατικές αρχές διαμόρφωσαν τα φιλοσοφικά πλαίσια τόσο του Πλάτωνα όσο και του Αριστοτέλη, εστιάζοντας στις εμπειρικές και ηθικές αρχές που ενσωμάτωσαν αυτοί οι στοχαστές στην κατανόησή τους για την υγεία και το ανθρώπινο σώμα.

Χρησιμοποιώντας βιβλιογραφική ανασκόπηση, ανάλυση κειμένου και συγκριτική αξιολόγηση, αυτό το άρθρο υπογραμμίζει τη φιλοσοφική επικάλυψη στην ιατρική σκέψη στον Πλάτωνα και τον Αριστοτέλη και πώς η σκέψη τους εξακολουθεί να επηρεάζει την τρέχουσα ιατρική πρακτική. Για τον Πλάτωνα, η ιατρική υπηρετεί ως ηθική και πρακτική επιστήμη που βασίζεται στην ορθολογική έρευνα, και τα έργα του όπως ο Γοργίας και ο Φαίδρος αντικατοπτρίζουν την άποψη ότι η ιατρική, όπως και η φιλοσοφία, αναζητά αλήθεια και ηθικό σκοπό. Υποστήριξε την ιατρική ως «τέλεια τέχνη», εκτιμώντας τόσο την ατομική υγεία όσο και την ηθική διακυβέρνηση της κοινωνίας. Ο Αριστοτέλης, επηρεασμένος από την ιατρική του καταγωγή, προώθησε μια πιο εμπειρική προσέγγιση, διακρίνοντας τους τύπους σωματικής κίνησης και εισάγοντας την πρώιμη ανατομική ταξινόμηση στις μελέτες του για ομοιογενή και ετερογενή μέρη του σώματος. Τόνισε ότι η ιατρική πρέπει να στοχεύει στην ανθρώπινη άνθηση (ευδαιμονία) μέσω ισορροπημένης, προσαρμόσιμης φροντίδας, με συμπόνια και ηθική ευθύνη στο επίκεντρο της ιατρικής πρακτικής.

Αυτό το άρθρο υποστηρίζει ότι οι ιπποκρατικές ιδέες για τη φυσική αιτιότητα, την παρατήρηση και την ηθική με επίκεντρο τον ασθενή διαμόρφωσαν σημαντικά και τους δύο φιλοσόφους. Τα έργα τους καθιέρωσαν θεμελιώδεις αρχές για τη δυτική ιατρική, γεφυρώνοντας την εμπειρική παρατήρηση με την ηθική φιλοσοφία και δημιουργώντας ένα πλαίσιο μέσα στο οποίο η σύγχρονη ιατρική συνεχίζει να λειτουργεί, βασισμένη στην επιστημονική έρευνα, την ηθική ακεραιότητα, την αυτονομία του ασθενούς και την ολιστική φροντίδα.

Λέξεις Κλειδιά: *Ιατρική, αρχαία φιλοσοφία, ιστορία της φιλοσοφίας, Πλάτων, Αριστοτέλης*

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Elio Lugaresi (1926-2015): A founding father of the history of sleep disorders

De Santo Rosa Maria[1]

Abstract

The history of sleep disorder research began with the landmark 1953 paper by Aserinsky and Kleitman in *Science*, titled "Regularly Occurring Periods of Eye Motility and Concomitant Phenomena". This field advanced on the shoulders of many giants, including Nathaniel Kleitman (Chicago), William C. Dement (Stanford), Henri Gastaut (Marseille), Elio Lugaresi (Bologna), Christian Guilleminault (Stanford), and Colin Sullivan (Sydney).

Elio Lugaresi (Castiglione di Cervia, July 1, 1926 – Bologna, December 22, 2015) was one of those giants who transformed Sleep Medicine into one of the most dynamic fields of research and treatment. Lugaresi graduated from the University of Bologna in 1952. During his residency in Neurology at the same university, he trained in polysomnography (PSG) with Henri Gastaut from 1956 to 1957 in Marseille. He connected clinical observations with PSG data, and, upon returning to Bologna, began working with Giorgio Coccagna and others to conduct PSG recordings using a rudimentary electroencephalograph.

The group produced seminal papers on (i) pulmonary pressures, arterial pressure, blood gases, breathing, and sleep; (ii) Restless legs syndrome and myoclonus; (iii) snoring and hypertension, which led to the identification of sleep apnoea as a risk factor for cardiovascular disease; and (iv) Fatal Familial Insomnia. In 1967, they organised the First International Congress on Sleep Medicine in Bologna.

As stated in an interview with the Italian Association of Sleep Medicine, Lugaresi was inspired by the Renaissance idea that all knowledge should stem from the observation of humanity. Even in his emeritus days, he worked successfully, producing more than 500 papers and chapters, which have garnered him a long list of awards and honours. William C. Dement, referring to the originality of Lugaresi's work, argued, "It is not clear what would have happened if an Italian neurologist, Elio Lugaresi, had not become very interested in obstructive sleep apnoea".

Key Words: *Elio Lugaresi, polysomnography, pulmonary pressure, arterial pressure, breathing, blood gases, fatal familial insomnia*

Introduction

The history of sleep disorder research began with the landmark paper by Aserinsky and Kleitman in 1953, published in *Science*, titled "Regularly Occurring Periods of Eye Motility and Concomitant Phenomena".[1] This field progressed on the shoulders of many giants, including Nathaniel Kleitman (Chicago), William C. Dement (Stanford), Henry Gastaut (Marseille), Elio Lugaresi (Bologna), Christian Guilleminault (Stanford), and Colin Sullivan (Sydney). These individuals may be regarded as the modern equivalents of the "giants" referenced by Bernard of Chartres, upon whose shoulders contemporary scholars stand in order to see further and gain deeper insight.

William C. Dement, in placing the study of human sleep in a historical framework,[2] wrote:

"Obstructive sleep apnoea was discovered in Europe in 1965 by two separate groups, Gastaut et al[3] and Jung and Kuhlo.[4] Kuhlo et al[5] are credited with performing the first tracheostomy with the intention of bypassing airway obstruction that occurred during sleep in the upper airway of these very obese patients" … "It is not clear what would have happened if an Ital-

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ian neurologist, Elio Lugaresi, had not become very interested in obstructive sleep apnoea which he called "hypersomnia with periodic breathing". He pursued the problem with unusual zeal, although he did not publish his seminal study[6] documenting an association between snoring and hypertension until 1975".

The aim of this study is to highlight the contributions of Elio Lugaresi and his team at the University of Bologna to the establishment of Sleep Medicine, particularly through the promotion of polysomnography, which represented a breakthrough in the measurement of sleep.

Elio Lugaresi, the man and the scientist

Elio Lugaresi (Figure 1) was born in Castiglione di Cervia on 1 July 1926. He studied Medicine at the University of Bologna, where he developed a strong interest in Physiology and Neurology. His subsequent career unfolded primarily in Bologna, with a notable training period in 1956 and 1957 under Henri Gastaut in Marseille. In Bologna, he organised a pioneering sleep laboratory and established a dedicated sleep unit. He enjoyed a distinguished academic career, ultimately becoming a Full Professor of Neurology and serving as Director of the Institute of Clinical Neurology, the Postgraduate School in Neurology, and the School of Neurophysiopathology Technicians. Although he retired in 2001, he continued his scholarly and clinical work as Emeritus Professor until his death in Bologna on 22 December 2015.

Figure 1. Professor Elio Lugaresi.
Photograph by: Paolo Ferrari
Archivio Ferrari Genus Bononiae
"Collezioni d'Arte e di Storia della Fondazione Cassa di Risparmio in Bologna"

Lugaresi was one of the giants who transformed Sleep Medicine into one of the most dynamic fields of research and treatment (Table 1). His contributions are reflected in 404 publications in peer-reviewed journals, a list of books (Table 2) that garnered 25,805 citations, a D-index of 91, and an array of prestigious awards (Table 3). His worldwide recognition is further underscored by his roles in scientific societies and esteemed memberships (Table 4).

Contributions of the Lugaresi Group to Sleep Medicine

Fabio Cirignotta highlighted the achievements of the Lugaresi group and pointed out that they were the first to document the major fluctuations in pulmonary and systemic arterial pressure during obstructive apnoeas and to highlight the close physiopathogenetic connections between snoring and obstructive apnoeas.[7]

"This period also saw the first studies on Restless Legs Syndrome and Periodic Limb Movements at the Neurology Institute, followed by research spanning the whole field of sleep disorders. One of the most promising fields of research proved to be the epidemiological studies on insomnia, parasomnia and snoring culminating in an international Workshop that took place in Milano Marittima in 1982".[7-12]

In his CV, available at the University of Bologna, Elio Lugaresi wrote:

"The first polysomnographic investigation into Restless Legs Syndrome demonstrating the presence of involuntary periodic limb movement termed "Nocturnal myoclonus".

"Pioneering research into snoring and sleep apnoea: (a)The hemodynamic and ventilatory effects of obstructive apnoeas. (b)The clinical and physio pathological link between snoring and apnoea syndrome (c) Snoring as a risk factor for cardiovascular disease".

The Historic 1972 Rimini Congress

In 1972, Elio Lugaresi and his group organised a Symposium on Hypersomnia and Periodic Breathing in Rimini, which brought together many world-renowned investigators to discuss the polygraphic aspects of sleep. Papers of the congress were published in the *Bulletin de Physiopathologie Respiratoire*. Lugaresi highlighted data on "Polygraphic Aspects of Sleep Disorder in Man",[13] stressing the importance of overnight polygraphic studies involving the simultaneous electroencephalogram (EEG), electrooculogram (EOG), and electromyogram (EMG)

Table 1. Elio Lugaresi, short biography.

• Born in Castiglione di Cervia on 1 July 1926.
• Studied Medicine at the University of Bologna (1946-1952).
• Residency in Neurology at the University of Bologna (1952-1958).
• Training at the EEG Laboratory of Henri Gastaut in Marseille (1956-1957).
• Organisation of the Sleep Laboratory at the University of Bologna.
• Chief of Inpatient Neurology Service (1958-1968).
• Director Laboratory of Sleep Disorders at the University of Bologna. Among his associates Giorgio Coccagna.
• Organiser at Rimini of an outstanding congress on Hypersomnia and Periodic Breathing (1972).
• Full Professor of Neurology at the University of Bologna in 1975.
• Director of the Institute of Clinical Neurology (1975-1998).
• Director of the School of Neurophysiopathology Technicians (1975-1998).
• Director of the Postgraduate School of Neurology (1977-1999).
• Retirement from university 2001.
• Professor Emeritus at the University of Bologna 2001.
• Death in Bologna on 22 December 2015.

recordings. Lugaresi's group also provided data on "Continuous Recordings of the Pulmonary and Systemic Arterial Pressure During Sleep in Syndromes of Hypersomnia with Periodic Breathing".[14] They showed that in hypersomniac hypertensive patients, there was an increase in systemic and pulmonary arterial pressure, which was highest at the end of each apnoea. The pressure rose progressively during the successive stages of slow sleep and increased further during REM sleep. Changes in heart rate paralleled those in pressure values. All patients developed severe

Table 2. Books authored and coauthored by Elio Lugaresi.

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• Guilleminault C, Lugaresi E, Montagna P, Gambetti P. (Eds.) Fatal Familial Insomnia. Inherited prion diseases, sleep, and the thalamus. New York, Raven Press, 1994.

Table 3. Elio Lugaresi list of awards.

• 1983: American Association of Sleep Disorders.
• 1995: Ottorino Rossi Award for Neurology of "C. Mondino" Foundation University of Pavia.
• 1996: Pisa Sleep Award of the American Academy of Neurology.
• 1997: Potamkin Prize of the American Academy of Neurology.
• 1998: Giuseppe Moruzzi Award of the World Federation of Clinical Neurophysiology.
• 2003: Founder of the field of modern sleep research of the Sleep Research Society.
• 2003: William C. Dement Academic Achievement Award of the American Academy of Sleep Medicine.
• 2004: «Interbrew – Baillet Latour de la Santé» Foundation Prize.
• 2008: "Giuseppe Caruso" Award of the Italian Society of Clinical Neurophysiology.
In recognition of his leadership the World Association of Sleep Medicine established the Elio Lugaresi Award for Sleep Medicine.

Table 4. Recognition of Lugaresi success in science.

Presidency of Italian Scientific Societies
• Italian EEG Society (1969-1972).
• Italian League against Epilepsy (1972-1976).
• Italian Society of Neurology (1984-1987).
• Italian Association of Sleep Medicine (1990-1994).
• Italian College of Neurologists (1996-2000).
Membership in Medical and Scientific Societies
• Ambassador for Epilepsy for the International League Against Epilepsy.
• Corresponding Member American Neurological Association.
• Honorary Member of the Association for Sleep Disorders Centres.
• Honorary Member German EEG Society.
• Honorary Member French Society of Neurology.
• Honorary Member Spanish League against Epilepsy.
• Honorary Fellow of the American of Sleep Disorders Association.

acidosis with hypoxia and hypercapnia, which significantly increased from wakefulness to slow sleep and from slow sleep to REM sleep.[14]

On the pioneering work of the Lugaresi Group in Bologna

"A pioneering team of anaesthesiologists, cardiologists, and pneumologists began working in Bologna, leading to consistent results in the field by the late 1960s".[15]

"An old electroencephalograph was moved each night from the normal laboratory to a larger room where patients could sleep in comfortable beds. In this setting, a doctor or a technician, illuminated only by the weak light of a flashlight, could perform periodic measurements.

Among those pioneering spirits who dedicated themselves to this research were Pierluigi Gambetti, now Professor of Neuropathology in Cleveland, and Domenico Gambi, Director of the Neurological Clinic of Chieti. However, it was Giorgio Coccagna who displayed the greatest enthusiasm and ingenuity; without his dedication, it is likely that the sleep laboratory would never have come to fruition. Two young technicians, Pierino Pollini and Francesco Negrini, accepted the challenging routine of night recordings, driven not only by their sense of professional solidarity but perhaps also by their attraction to the originality of the work, which fuelled our shared enthusiasm".[16]

Paola Verucci Coccagna, anaesthesiologist trained to monitor vital signs, played a leading role in the group. She was instrumental in the measurements of systemic and pulmonary arterial pressure and blood gases.

"At what was to become an historic event, the 1972 Congress held in Rimini, the group presented a full spectrum of cardiocirculatory and ventilatory changes occurring during sleep in obstructive apnoea syndrome. A mistake was the unfortunate name given to the syndrome Hypersomnia with Periodic Breathing, which, in fact, was subsequently changed to the more effective term of Obstructive Sleep Apnoea Syndrome (OSAS). It was the first time that the data from Bologna polysomnographic studies had been made available, they were to become a familiar sight in sleep laboratories all over the world documenting the important ventilatory and haemodynamic effects of obstructive apnoeas".[15]

Major contributions to Sleep Medicine

A study[14] was performed on 10 patients with diurnal hypersomnia and periodic respiration with apnoea during sleep. Five patients had high blood pressure. Simultaneous overnight recordings were made of various parameters, including electrocardiogram (ECG), cardiotachygram, electroencephalogram (EEG), electromyogram (EMG), electrooculogram of the mylohyoid muscle, thoracic respiratory movements, nasal and oral respirograms, pulmonary arterial pressure, systemic arterial pressure, and blood gases, recorded when ventilation was restored and during subsequent apnoeas. Patients were studied during wakefulness as well as during sleep stages 1, 2, 3-4, and REM sleep. The results showed that pulmonary arterial pressure increased from sleep stage 1 to sleep stage 3-4 and peaked during REM sleep.

Systemic arterial pressure increased progressively from wakefulness to stages 3-4 and peaked during REM sleep. Blood gas analyses revealed acidosis, hypercapnia, and hypoxia, which worsened from wakefulness to REM. In patients with hypersomnia and periodic breathing, performing tracheostomy effectively abolished diurnal somnolence and significantly reduced the number of apnoeas. Additionally, both pulmonary and systemic arterial pressures normalised, along with the resolution of acidosis, hypoxia, and hypercapnia.[17]

A study investigating overnight changes in systemic blood pressure compared 8 heavy snorers to 8 normal subjects.[6] The results demonstrated that, in normal subjects, blood pressure decreased significantly and progressively from wakefulness to stages 1, 2, and 3-4. During REM sleep, blood pressure values were found to be similar to those in stage 2. In contrast, heavy snorers exhibited a progressive and significant increase in systolic blood pressure from wakefulness to REM sleep. Diastolic blood pressure also showed a similar, albeit less pronounced, upward trend from the slower sleep stages to REM.

Epidemiological studies on snoring

Studies by Lugaresi et al. have indicated that heavy and habitual snoring may adversely affect cardiac and circulatory function. To investigate whether these are a predisposing factor for hypertension and cardiocirculatory diseases, Lugaresi sought support from national funding agencies for such a study, but funding was not made available. Nonetheless, he received a personal contribution from his friend and colleague Bill Dement, who was the first to document overnight changes in sleep.

The study was conducted in the Republic of San Marino, which has a population of approximately 20,000 people. All citizens have free access to healthcare, and their medical data is recorded in personal files. A total of 5,713 individuals were examined. Among the population, 13.8% were identified as habitual snorers, with a higher prevalence in males than

in females. Hypertension was observed in 2.8% of individuals aged 21-40, in 10.4% of those aged 41-60, and in 27.6% of individuals aged 61-80. The study found that snorers were more prone to high blood pressure. These preliminary findings support the notion that heavy and habitual snorers are at an increased risk of cardiovascular disease.[18]

Fatal Familial Insomnia

Fatal Familial Insomnia, as described by Lugaresi et al. in 1986 in *The New England Journal of Medicine*, is a disease characterised by an inability to sleep, dysautonomia, and motor disturbances. These motor disturbances include myoclonus, ataxia, and pyramidal signs.[19]

Seven years later, Lugaresi et al. were able to distinguish Fatal Familial Insomnia (FFI) from Sporadic Fatal Insomnia in *Lancet Neurology*.[20] In the meantime, data from Goldbarb et al. demonstrated in *Science* that Fatal Familial Insomnia and a subtype of familial Creutzfeldt-Jakob Disease (CJD) are both characterised by a mutation at codon 178 (Asn178) of the prion protein gene.[22] FFI and the familial CJD subtype segregate with different genotypes determined by the Asn178 mutation and the methionine-valine polymorphism at codon 129. Specifically, the Met129, Asn178 allele is associated with FFI, while the Val129, Asn178 allele is associated with familial CJD. Thus, two distinct disease phenotypes are linked to a single pathogenic mutation influenced by a common polymorphism.[21]

Lugaresi's Method

The method Elio Lugaresi adopted was outlined by his associates in the obituary published in *Sleep Medicine* 2016.

"Throughout his career Elio Lugaresi showed a remarkable ability to recognise what was important in his data, make the discovery and then, instead of passing to another topic, create a sustained research program. This is repeatedly exemplified in his series of papers on Nocturnal Frontal Lobe Epilepsy and Fatal Familial Insomnia. The scientific method he passed on to his neurology research group was based on the observation and consequent description an analysis of clinical phenomenon's. After that, he always developed a complex reasoning, accompanied by a cultured and creative explanation of the patients' disease".[22]

There may be several reasons for why his studies initially failed to promote immediate interest in addressing a leading health problem:

"The publication by Coccagna et al. on systemic and pulmonary surges of blood pressure during sleep in Pickwickian patients was cited 193 times. However, as explained to me by Elio Lugaresi, these papers were not published in leading medical journals such as *The New England Journal of Medicine*, *The Lancet*, or *The British Medical Journal*, which limited their potential to impact everyday medical practice. So, it is evident that the journals chosen to convey the findings of the Lugaresi group were too specialized, to inform the broader scientific community of a breakthrough (23)."

Thoughts on Professor Elio Lugaresi's contributions to Sleep Medicine

"Everything started thanks to my relationship with Henry Gastaut. When American colleagues began publishing on polysomnography, Gastaut advised my collaboration with Tassinari to adopt the method. Together with Coccagna and a team of technicians, we began overnight recordings in an unconventional way, utilizing an old encephalograph set up in the nearby bathroom, while the recordings were conducted in an adjacent room. Everything was quite artisanal during those early days. However, we quickly realized how fortunate we were, as each recording unveiled new discoveries. Sleep had not been extensively studied before, and we had ventured into a 'terra incognita.'

"Our research approached the subject in a Renaissance manner, centred around the patient."

"The investigator is the poet of reality. Intuition serves as the fundamental act of discovery. The new can only be uncovered by understanding the old, yet it is culture that allows us to recognize and embrace the new."

"Regarding Sleep Disorders as an independent specialty, I am open to the development of specialties as long as they do not become isolated 'ivory towers.' I am cautious about the idea of isolated Sleep Medicine. I am uncertain whether, in the future, the medical field will witness further subdivisions."

"The future might drive us there. Nowadays Sleep Medicine is one of the most dynamic and active branches of Medicine". "I hope to be remembered for my contributions to the studies on sleep medicine".[24]

Lugaresi preparing for retirement

On the day of his retirement, Marina Amaduzzi, a journalist of *la Repubblica*, [the second most important Italian daily] asked him about his plans for the future.

He answered: "I'm stepping out of my role, but I will continue to work." After all, at 90 years of age, Montanelli [influential columnist at *Il Corriere della Sera*] continues to write and Michelangelo painted the Pietà in the last years of his life. If the brain continues to function, I will continue

to work. I am also ready for the end; we must accept that life has its own arc. Montaigne said that philosophising is learning to die: our life is not eternal, but its limit is not due to chronological age or the roles one plays".

"We were lucky and achieved important results, although there were things I could have done better. We made great discoveries about snoring and sleep apnoea, but they have not been disseminated in the right way, because we published them in the wrong journals. However, I am extremely satisfied, because we worked in difficult conditions".[25]

The role of Lugaresi in the advent of modern Sleep Medicine

The problem of sleep has occupied human thought since Western Antiquity (26), with references traceable as far back as the Homeric poems (c. 750-723 BCE). In the *Iliad* (XIV, 270), the God of Sleep is said to reside on the Isle of Lemnos, where even Juno journeyed to implore him - "the brother of Death" - to lull Zeus into slumber.

For Heraclitus (Table 5) of Ephesus (*floruit* 504-501 BCE), "in sleep, the sense channels are closed, preventing the mind from connecting with what lies outside". For Alcmaeon of Croton (510-440 BCE) "Sleep is caused by the confinement of blood to larger blood-vessels, whereas waking is brought about by re-diffusion". For Diogenes of Apollonia (*floruit* 440-430 BCE)" Sleep is caused by moistening of the air-soul". According to Aëtius "Empedocles of Akragas (492-432 BCE) thinks that sleep depends on a moderate cooling of the warmth in the blood, death by contrast is a total cooling…sleep depends on the separation of the element fire". For Anaxagoras (500/497-428 BCE) sleep was a process unrelated to the soul and entirely due to the body temperature, and therefore it could be considered as "exhaustion of physical energy".

For Plato (429-347 BCE) "Sleep is useful to the body. One should sleep a little, an indispensable minimum. Only those lacking responsibility sleep a lot. The master and the mistress of the house should sleep a little. A long sleep is not appropriate, neither for law of nature nor for the body, nor the soul, nor to the actions of body and soul (*Laws VII*). "Who sleeps is of no value, as a dead body" (Laws, VII).

Aristotle (384-322 BCE) wrote extensively in *On sleep and waking* that is part of *Small Essays on Philosophy of Nature*. "Sleep and waking belong to the same part of the animal since they are antagonists; sleep appears as a lack of waking and waking as a deprivation of sleep. In fact, in nature as everywhere contraries appear within the same receptor and constitutes its affection (*On Sleep and Wakings 453b 25*). The sleep is an affection of the perceptive part, like a kind of enchainment and immobility, so that it is necessary that all that sleeps entails a perceptive part" (*On Sleep and Wakings 454 b 15*).

Sleep follows alimentation, which generates blood that then diffuses throughout the entire body. During the process of digestion, evaporation occurs, cooling the blood before it is sent to the brain. As a result, the head becomes cold and heavy. The blood then returns to the heart, where it pushes the natural heat characteristic of that region, leading the animal to sleep.

Sleep Medicine is now a clinical science that plays a crucial adjunct role in the management of nearly every disease. The problem of sleep disorders has occupied humankind since Antiquity. However, it was only 96 years ago that technological advancements made it possible to quantify sleep disorders in humans, marking a significant milestone in the field.[27] Berger's study,[28] conducted 96 years ago, was the first (Table 6) in a series of significant advancements in the field: (a). The identification of NREM

Table 5. Ancient authors mentioning sleep disorders.

Author	Date	Works
Homer	750-723 BCE	*Iliad* XIV, 270
Hesiod	born c 700 BCE	*Theogony* 211-212
Heraclitus	floruit 504 - 501 BCE	*Stromata*, Fragment 21 of Clemens Alexandrinus
Diogenes	floruit 440 - 430 BCE	Diehl-Kranz, *Die Fragmente der Vorsokratiker.*
Alcmaeon	510? - 440? BCE	Diehl-Kranz, *Die Fragmente der Vorsokratiker.*
Anaxagoras	507/497 - 428 BCE	Diehl-Kranz, *Die Fragmente der Vorsokratiker.*
Empedocles	492 - 432 BCE	*Purifications,* Diehl-Kranz, *Die Fragmente der Vorsokratiker*
Plato	429 - 347 BCE	Laws VII, 808b6-c2, 808b5-6
Aristotle	384 - 322 BCE	On Sleep and Wakings

Table 6. The advent of Sleep Medicine.[27]

Year	Ref.	Discovery
1929	28	Electroencephalogram in humans
1937	29	NREM sleep
1953	1	REM sleep
1956	30	Obesity and hypoventilation
1957	31	4 stages of NREM and REM sleep
1960	32	Narcolepsy and early onset REM
1966	33	Pathology of Upper Way Collapse
1972	9	First systematic study on how systemic arterial pressure behaves during sleep in normal subjects
1972	14	Blood pressure changes went along changes in heart rate, breathing and oxygen saturation
1986	34	REM Sleep Behaviour Disorder
1993	35	High prevalence of Obstructive Sleep Apnoea in middle-aged population
2000	36	High prevalence of Restless Legs Syndrome

sleep[29]; (b). The characterisation of REM sleep (1); (c).The link between Obesity and hypoventilation[30]; (d).The identification of 4 stages of NREM and REM sleep[31]; (e).Narcolepsy and early onset REM[32]; (f). The first systematic study on how systemic arterial pressure behaves during sleep in normal subjects[9]; (g).The demonstration that blood pressure changes went along changes in heart rate, breathing and oxygen saturation[14]; (h).The identification of the pathology of upper way Collapse[33]; (i).The REM sleep behaviour disorder[34]; (l). The demonstration of the prevalence of Obstructive Sleep Apnea in middle-aged population[35]; (m). The demonstration that the prevalence of Restless Legs Syndrome is 10%[36]. Notably, steps (g) and (h) were due to the genius and hard work of Lugaresi's group in Bologna.[9,14] Those two studies gave the possibility to characterise sleep disorders at bedside.

Conclusion

As summarised by Schutz and Salzarulo "sleep medicine, which is a quite new medical field with a long clinical tradition, developed rapidly in the last three decades of the 20th century" (37). There is no doubt that Lugaresi and his group have played a significant role in this exciting story.

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ΠΕΡΙΛΗΨΗ

Elio Lugaresi (1926-2015): Πρωτοπόρος στην ιστορία των διαταραχών ύπνου

De Santo Rosa Maria

Η ιστορία της έρευνας στις διαταραχές ύπνου ξεκίνησε με την εμβληματική εργασία των Aserinsky και Kleitman το 1953 στο περιοδικό *Science*, με τίτλο «Regularly Occurring Periods of Eye Motility and Concomitant Phenomena». Ο τομέας αυτός εξελίχθηκε χάρη στη συνεισφορά πολλών σπουδαίων επιστημόνων, όπως οι Nathaniel Kleitman (Σικάγο), William C. Dement (Στάνφορντ), Henri Gastaut (Μασσαλία), Elio Lugaresi (Μπολόνια), Christian Guilleminault (Στάνφορντ) και Colin Sullivan (Σίδνεϋ).

Ο Elio Lugaresi (Castiglione di Cervia, 1 Ιουλίου 1926 – Μπολόνια, 22 Δεκεμβρίου 2015) ήταν ένας από αυτούς τους γίγαντες που μετέτρεψαν την Ιατρική του Ύπνου σε έναν από τους πιο δυναμικούς τομείς έρευνας και θεραπείας. Αποφοίτησε από το Πανεπιστήμιο της Μπολόνια το 1952. Κατά τη διάρκεια της ειδικότητάς του στη Νευρολογία στο ίδιο πανεπιστήμιο, εκπαιδεύτηκε στην πολυυπνογραφία (PSG) υπό τον Henri Gastaut από το 1956 έως το 1957 στη Μασσαλία. Συνέδεσε τις κλινικές παρατηρήσεις με τα δεδομένα της πολυυπνογραφίας και, επιστρέφοντας στην Μπολόνια, άρχισε να συνεργάζεται με τον Giorgio Coccagna και άλλους για την καταγραφή πολυυπνογραφικών δεδομένων χρησιμοποιώντας ένα πρωτόγονο ηλεκτροεγκεφαλογράφο.

Η ομάδα παρήγαγε πρωτοποριακές εργασίες για: (i) τις πνευμονικές πιέσεις, την αρτηριακή πίεση, τα αέρια αίματος, την αναπνοή και τον ύπνο· (ii) το σύνδρομο ανήσυχων άκρων και τον μυόκλονο· (iii) το ροχαλητό και την υπέρταση, που οδήγησαν στην αναγνώριση της υπνικής άπνοιας ως παράγοντα κινδύνου για καρδιαγγειακή νόσο· και (iv) την Θανατηφόρο Οικογενή Αϋπνία. Το 1967, οργάνωσαν το Πρώτο Διεθνές Συνέδριο Ιατρικής του Ύπνου στη Μπολόνια.

Όπως δήλωσε σε συνέντευξή του στην Ιταλική Εταιρεία Ιατρικής Ύπνου, ο Lugaresi εμπνεύστηκε από την αναγεννησιακή ιδέα ότι όλη η γνώση πρέπει να πηγάζει από την παρατήρηση της ανθρώπινης ύπαρξης. Ακόμη και κατά τα έτη του ως ομότιμος καθηγητής, παρέμεινε παραγωγικός, συγγράφοντας περισσότερες από 500 εργασίες και κεφάλαια, τα οποία του απέφεραν μια μακρά λίστα βραβείων και τιμητικών διακρίσεων. Ο William C. Dement, αναφερόμενος στην πρωτοτυπία του έργου του Lugaresi, δήλωσε: «Δεν είναι σαφές τι θα είχε συμβεί αν ένας Ιταλός νευρολόγος, ο Elio Lugaresi, δεν είχε δείξει τόσο μεγάλο ενδιαφέρον για την αποφρακτική υπνική άπνοια».

Λέξεις Κλειδιά: *Elio Lugaresi, πολυυπνογραφία, πνευμονική πίεση, αρτηριακή πίεση, αναπνοή, αέρια αίματος, θανατηφόρος οικογενής αϋπνία*

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The Evolution of Veterinary Medicine in Turkey: From Ancient Civilizations to the Present

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Figure 1. A page from from the Hippiatrica with written and illustrated instructions on drenching a horse to induce diarrhea. 14th century edition.[10] *https://en.wikipedia.org/wiki/Hippiatrica*

Abstract

Veterinary medicine, which supplied the medical study, diagnosis, and treatment in animals, has a broad and long history. Being able to understand how these practices have evolved over time is important for those who seek to appreciate the various advances and challenges which this field has gone through. In particular, such history is deeply interwoven with cultural, political, and economic transformations in Turkey. While the major focus of this article is to discuss the development process of veterinary medicine in Turkey, it also points to several key periods, figures, and contributions that make its trajectory intelligible. The history of veterinary medicine in Turkey is, in essence, importantly characterized by developments and contributions that cut across different eras. From early practices undertaken in ancient civilizations to the integration of Islamic medical knowledge and modernization efforts driven through the Ottoman Empire, each period has simply built upon the gains of the last. The Early Republican Period in the leadership of Mustafa Kemal

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Atatürk laid a robust foundation for contemporary veterinary education and practice. This technology and infrastructural development in the mid-to-late 20th century resulted in substantial improvements in health and productivity in animals. Veterinarians in Turkey continue to play a cutting-edge role in public health, food safety, and wildlife conservation, while facing a new set of challenges and opportunities that call for innovative ideas and international collaboration

Key Words: *History of veterinary medicine, Anatolia,Türkiye*

Introduction

Veterinary medicine generally relates to the area of medicine responsible for the prevention, diagnosis, and treatment of diseases in animals. It has a somewhat rich and varied history. Understanding the evolution of veterinary practices puts into perspective the development, successes, and setbacks experienced therein. In Turkey, the history of veterinary medicine is deeply associated with the cultural, political, and economic transformations of the country. Since the times of the ancient Anatolian civilizations down to the establishment of the modern republic, veterinary medicine has played an indispensable role in public health, agriculture, and animal welfare. Based on this, this article will try to discuss the development of veterinary medicine in Turkey, underlining major periods, figures, and contributions responsible for its trajectory. It is for this reason that the history of veterinary medicine in Turkey is done—to understand the wider perspective it occupies in the annals of medical and scientific progress, and understand the immense contribution veterinarians have made to society.

1. Early Domestication and Care of Animals in Anatolian Civilizations

The land of Anatolia played a crucial role in the early domestication and care of animals, serving as a vital region for ancient civilizations such as the Hittites and Phrygians. These societies made significant contributions to the development of veterinary practices essential for maintaining domesticated animals.[1-3] The Hittites, who established a powerful empire in Anatolia around 1600 BCE, demonstrated advanced agricultural and animal husbandry techniques. They domesticated horses, cattle, sheep, and goats, and their expertise in breeding and raising these animals is well-documented on cuneiform tablets. These records provide valuable insights into veterinary treatments, breeding practices, and the religious and economic roles of animals. The Hittites' respect for animal welfare is also reflected in their mythology, highlighting their awareness of the importance of animal care.[2-4]

The Phrygians, emerging around 1200 BCE, built upon the traditions of their Hittite predecessors in animal domestication and veterinary care. Renowned for their connection to horses, these animals were central to Phrygian culture and economy. The legendary King Midas is often depicted alongside horses, emphasizing their significance in Phrygian society. Archaeological evidence, including artifacts and inscriptions, suggests the Phrygians developed specialized knowledge in animal husbandry, particularly in disease prevention and treatment.[5]

Veterinary Practices in Ancient Greece

In ancient Greece, animals played a crucial role in various aspects of society, functioning as agricultural workers, means of transportation, assets in warfare, and even as companions or sacred symbols. Due to their significant roles, a focused interest in maintaining their health emerged, forming the early foundations of what is now considered veterinary care. While veterinary medicine in Greece was not as developed or organized as human medicine, ample evidence from texts, inscriptions, and archaeological discoveries demonstrates the existence of dedicated practices aimed at animal health.

Horses, among all animals, demanded the most diligent care in ancient Greece, primarily because of their pivotal role in warfare and transportation. The strength and readiness of cavalry forces were vital to the success of many city-states, where the condition of a horse could determine the outcome of battles.[6] Specialists in equine care, often referred to as "horse-doctors" (ἱππίατροι), were esteemed for their expertise in treating injuries and illnesses affecting horses. Their skills ensured that these prized animals remained capable and reliable, both on the battlefield and in other essential duties.[7]

The Hippiatrika: A Window into Ancient Equine Medicine

A key source of knowledge about Greek veterinary practices, especially concerning horses, is the Hippiatrika (Ἱππιατρικά), a collection of Byzantine manuscripts that compile earlier Greek writings on equine

care.[8] Although the surviving manuscripts primarily date to the medieval period, they preserve content likely originating from the Hellenistic and Roman eras.[9] These texts cover various aspects of horse care, including anatomy, feeding practices, stable design, and treatments for a range of ailments, such as sprains, hoof issues, and internal illnesses. Remedies described in the Hippiatrika range from practical techniques, like thoroughly cleaning wounds, to ritualistic approaches, reflecting the broader medical and occasionally superstitious beliefs of the time.[10]

Greek veterinary practices were shaped by the dominant theories of human medicine, notably those found in the Hippocratic corpus, which emphasized the concept of humoral balance.[11] Ideas of "hot," "cold," "moist," and "dry" were applied to animal physiology, guiding practices such as dietary modifications, environmental adjustments, and changes in training routines.[12] This focus on restoring and maintaining bodily equilibrium represented a universal medical framework that transcended human care, influencing the treatment of livestock and working animals alike.

Aristotle's Observations and Comparative Anatomy

Aristotle (384–322 BCE) made significant contributions to the study of animals through his work in comparative anatomy and zoological classification, though his focus was primarily philosophical and scientific rather than clinical.[13] In *History of Animals*, he documented a wide array of species, analyzing their physical characteristics, behaviors, and typical ailments. While not intended as a veterinary guide, Aristotle's methodical approach offered a foundational framework for understanding animal physiology and, by extension, their potential diseases, influencing subsequent studies in the field.

Xenophon and Practical Horsemanship

Xenophon (430–354 BCE) offered significant insights into equine care through his writings, including *On Horsemanship* and *Hipparchicus*.[14] These works delivered practical advice on selecting sound horses, setting up appropriate feeding routines, and diagnosing issues like lameness or respiratory distress.[15] Importantly, Xenophon highlighted the value of humane treatment and diligent observation, stressing the need to identify potential problems early by noting slight changes in a horse's movement or appetite, thus preventing minor issues from escalating into major health concerns.[16]

Care for Other Livestock and Companion Animals

Although horses dominate the surviving sources, the Greeks also addressed the health of other livestock—such as oxen, sheep, goats, and pigs—given their essential roles in agriculture and domestic life. Inscriptions and farming records reveal common practices like disinfecting wounds, treating infections, and managing complications during birthing. Some evidence even points to remedies for dogs, valued as guard animals, hunting companions, and herding aids, though detailed descriptions of canine treatments are limited.[17]

While veterinary practices in ancient Greece lacked the organized sophistication of human medicine, they were integral to the broader Greek tradition of healing. Influential contributions, including Aristotle's anatomical studies, Xenophon's practical guidance, and the enduring Hippiatrika, later shaped Roman veterinary texts and informed medieval and Byzantine scholars who sought to preserve classical knowledge.[18] Thus, ancient Greek approaches to animal health, rooted in empirical observation and contemporary medical theories, established the groundwork for the gradual evolution of modern veterinary science.

2. The Byzantine Empire Period

Veterinary Practices in Byzantium

The Byzantine Empire carried forward many of the medical and scientific traditions of the ancient Greek world, including practical and theoretical approaches to the health of animals, especially horses, resulting in a distinctive body of veterinary knowledge.[19] The writings of Aristotle and Xenophon formed the basis of Byzantine veterinary understanding, but new socioeconomic circumstances—changing cavalry tactics, a broader integration of pack animals, and a vibrant court culture—also shaped these practices.

Early Byzantine veterinary care built upon Hellenistic and Roman sources like the works of Apsyrtos, Pelagonius, and others. Between the 5th and 10th centuries CE, many such texts were collected into the Hippiatrica (Ἱππιατρικά), a corpus of medical texts.[20] Byzantine compilers re-arranged, expanded, and annotated these materials to align with the Empire's needs, addressing local diseases and including topics such as diet, grooming, and stable management. The Hippiatrica forms one of the most important works of Byzantine veterinary medicine.[22] It combines purely practical advice with theoretical discussions rooted in Hippocratic notions of the "four humors." While

humoral theory underscores continuity with Greek medicine, references to prayers and blessings show a growing influence of Christian religiosity on healing practices.[23,24]

Military Imperatives and Prestige

Horses were vital symbols of power and tools of diplomacy in Byzantine society, used not just for travel or farming, but also in the Empire's cavalry forces. Military manuals like the *Taktika* of Emperor Leo VI highlight the critical need for veterinary knowledge[25]. At court, fine horses were status symbols, and their well-being was entrusted to specialized stable staff who likely used techniques from the Hippiatrica[26,27] (Figure 1).

Beyond Horses: Other Domesticated Animals

Other domesticated species, such as oxen, mules, and donkeys, were essential for agriculture and transportation.[3,15] Although fewer treatises exist for these animals, the 10th-century *Geoponika* occasionally references livestock care.[3,16,17] Dogs also received care for injuries, parasites, and diet, though detailed medical instructions for canines are limited.[16,18]

Integration of Religious and Empirical Approaches

Religious rituals were often integrated into otherwise empirical medical procedures. Prayers to Christian saints could be invoked for livestock recovery, reflecting the Byzantine worldview in which secular science coexisted with Christian faith.[19,22]

Byzantine veterinary texts did not vanish after 1453; manuscripts of the Hippiatrica continued to circulate in Greek and Latin translations. Their emphasis on equine anatomy, stable management, and disease diagnostics laid groundwork for more systematic veterinary medicine in the post-medieval era.[23,24]

Religious Influence

Christianity had a significant influence on Byzantine attitudes toward animals. While often anthropocentric, horses were especially cared for because of their military importance.[25,26] The state supported breeding and training programs, and although veterinary specialists were not institutionally formalized, they played a key role in maintaining the empire's military capability.[26,27]

Influence of Islamic Medicine on Veterinary Practices

The rise of Islam brought significant progress in various scientific fields, including veterinary medicine. Islamic scholars built on the knowledge of earlier civilizations (Greek, Roman, Persian), making notable contributions to veterinary care. This era promoted a holistic approach focusing on environment, diet, and the ethical treatment of animals, as advocated by Islamic teachings.[3,15]

Translations and preservation of classical texts (Aristotle, Hippocrates, Galen) were critical to advancing veterinary practices (Figure 2). Islamic veterinarians introduced innovative techniques and documented discoveries in comprehensive works like *Kitab al-Baytara* by Ibn al-Awwam.[3,16,17]

The Seljuk Empire

The Seljuk Empire (1037–1194) covered much of the Middle East and Anatolia. Known for supporting science and medicine, the Seljuks set up veterinary schools and hospitals (bimaristans) serving both humans and animals.[16,18] Scholars developed treatments for common horse ailments, surgical interventions for injuries, and produced texts widely used across the Islamic world (Figure 3).

3. Veterinary Practices During the Ottoman Era

During the Ottoman Empire (1299–1922), veterinary medicine advanced and became more formalized. Building on previous civilizations' achievements, the Ottomans integrated veterinary services into military and agricultural sectors, establishing schools in major cities and instituting regulations to ensure proper training.[19,22] Veterinary work addressed public health issues by managing diseases like anthrax and rabies. Islamic principles of compassion underpinned animal welfare efforts, integrating veterinary medicine into broader social and economic life.

Figure 2. This copper engraving, dates back to 1541, It shows the ancient physician Galen demonstrating through a public vivisection how a pig stops screaming when the nerves to its vocal cords are severed. *https://en.3rcenter.dk/laboratory-animals/history-of-animal-testing/animal-research-in-the-age-of-antiquity*

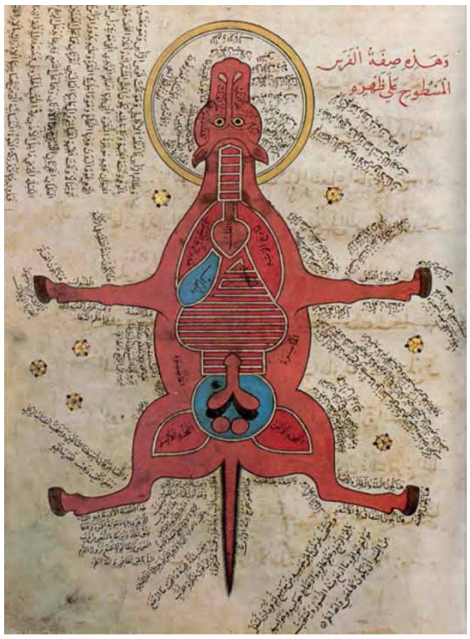

Figure 3. Horse anatomy in a Baytarname. In Turkish tradition, especially within the Ottoman realm, most baytarnâmes (veterinary treatises) were written under the inspiration of Aristotle's Baytarnâme, eventually gaining an anonymous character. Tuhfetü'l-fârisîn fî-ahvâli huyûli'l-mücâhidîn, translated from an Arabic work by Tayyarzâde Ata, is also one such treatise. *https://www.zdergisi.istanbul/media/magazines/pdf/Baytarnameler.pdf*

The Establishment of Formal Veterinary Services and Schools in the Ottoman Empire

Scientific veterinary education in Istanbul began in 1842 under Sultan Abdülmecit, with the founding of a Military Veterinary School led by Prussian veterinarian Godlewsky.[20,22] The curriculum included anatomy, pathology, pharmacology, and clinical practices. Organized veterinary services also stationed veterinarians regionally for inspections, disease prevention, and livestock care.[22]

Influential Figures in Ottoman Veterinary Medicine

- **Şerafeddin Sabuncuoğlu** (15th century): Often called the father of Turkish surgery, his *Kitab al-I'tibar* included sections on veterinary medicine, detailing surgical methods and anatomical illustrations.[23,24]
- **Mehmet Ali Bey** (late Ottoman period): Instrumental in establishing veterinary schools and modernizing curricula, ensuring integration of traditional and contemporary science[25,26] (Figure 4).

The Role of Veterinarians in the Military and Agricultural Sectors

Veterinarians were key to both military and agricultural frameworks. Horses formed the backbone of the Ottoman cavalry, requiring constant care to maintain readiness.[19,20] Livestock sustained the rural economy, and veterinarians prevented animal disease outbreaks, advised on breeding, and improved productivity.[20,21]

Figure 4. Veterinary Mehmet Ali Bey. Throughout his professional life, veterinary Mehmet Ali Bey fought against animal diseases and prepared reports on the measures to be taken in this struggle. In articles published in the journal Vasıta-i Servet, that he was the editor, the need for a civilian veterinary school was brought to the forefront. *https://veteriner.iuc.edu.tr/en/content/foundation-and-development/foundation-and-development*

Medicine in the Ottoman Empire: A Period of Transformation

The introduction of European veterinary knowledge into the Ottoman Empire marked a pivotal shift in the development of veterinary medicine.[1,2]. As the empire grappled with modernization and integration into the global economy, adopting European scientific advancements became critical. This exchange profoundly shaped veterinary practices, education, and the broader trajectory of veterinary science.

The 19th Century: Tanzimat Reforms and the European influence

The Tanzimat Reforms (1839–1876) aimed to modernize the military, education, and healthcare sectors.[3,4] Veterinary medicine was included: European scientific principles were incorporated into curricula, and schools/hospitals were established or revamped under Western guidance. European experts introduced advanced anatomy, pathology, and pharmacology techniques.[5,6] This collaboration improved public health and aligned the empire's practices with global standards. The reforms thus became a cornerstone for evolving veterinary medicine in the Ottoman Empire. European influence led to modernized veterinary schools[7,8] (Figure 5). Anatomy, pathology, pharmacol-

Figure 5. Veterinary school 1889. The first civilian Veterinary School which was established in 1889. It produced its first graduates in 1893. *http://vefader.org.tr/wp-content/uploads/2024/01/photo_2024-01-13_22-17-44-2.jpg*

Figure 6. Ankara University Veterinary Faculty Amphitheater (1933). Ankara University's Faculty of Veterinary Medicine preserves all the memories of the past with its historic amphitheater. *https://www.hurriyet.com.tr/yerel-haberler/ankara/tarih-kokan-fakulte-42113815*

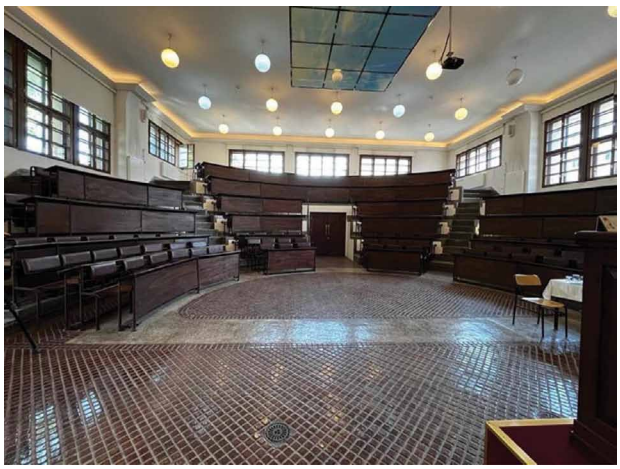

Figure 7. Ankara University Veterinary Faculty Amphitheater (today). Today, the Ankara University Amphitheater has been restored to its original condition.

ogy, and clinical practices were standardized, raising the quality of veterinary education. Diseases like rinderpest, anthrax, and glanders were better controlled through European diagnostic and management methods.[9,10]

4. The Early Republic Period (1923–1950s)

The Early Republic Period in Turkey, spanning from the establishment of the Republic in 1923 to the 1950s, was a transformative era marked by extensive reforms and modernization across various sectors, including veterinary medicine.[11,12] Guided by Mustafa Kemal Atatürk's vision for a modern, secular, and progressive Turkey, these reforms aimed to align the country with contemporary scientific and educational advancements. The importance of creating a secular and scientific educational framework to nurture skilled professionals in diverse fields was endorsed.[13,14] One of the most significant milestones in this process was the founding of the Veterinary Faculty at Ankara University in 1933, which became Turkey's primary center for veterinary education and research (Figure 6,7). Modeled after European veterinary schools, the Veterinary Faculty at Ankara University frequently invited experts from Europe to assist in curriculum development and teaching.[15,16] This alignment ensured Turkish students received an education comparable to international standards. The curriculum covered subjects such as animal anatomy, physiology, pathology, pharmacology, and clinical practices, with equal emphasis on theoretical knowledge and practical training.

Ord. Prof. Dr. Süreyya Tahsin Aygün: A Pioneer of Modern Veterinary Medicine in Turkey

Ord. Prof. Dr. Süreyya Tahsin Aygün (1895–1950) (Figure 8) was a leading figure in veterinary science during Turkey's Early Republic Period, significantly contributing to the modernization of veterinary practices and education under Mustafa Kemal Atatürk's vision.[17,18] Among his notable achievements were the development of the Turkish Universal Anthrax Vaccine, a resistant dry rinderpest vaccine, and early stem cell research, making him one of the pioneering scientists in this field. He retired from the army as a Brigadier General in 1950 but continued to serve as a faculty member in the Veterinary Faculty. Aygün famously declined the entry of thalidomide into Turkey, a drug later discovered to cause birth defects in pregnant women.[19] This decision likely prevented numerous congenital anomalies and stands as an

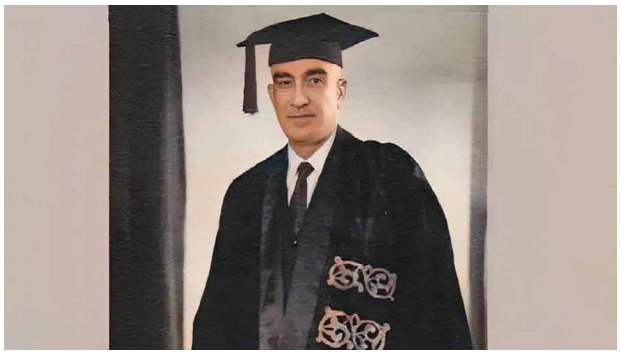

Figure 8. Süreyya Tahsin Aygün. He is known for discovering that the drug containing the active ingredient thalidomide, used to prevent various skin diseases, affects brain development in embryos, resulting in children being born with phocomelia. Aygün prevented its entry into the country. *https://cuneytyardimci.com/sureyya-tahsin-aygun-u-tanimiyor-olmanin-ayibi-hepimize-yeter/*

example of his cautious and research-based approach to new treatments.

Veterinary Infrastructure and Regulations

During the Early Republic, nationwide veterinary services expanded.[20,21] These services fostered public health, disease control, and agricultural productivity. Regional offices conducted inspections and developed vaccines,[22,23] improving diagnostic capacities, reducing disease prevalence, and boosting food security.[24,25]

Expansion of Veterinary Education (1960s–1990s)

Multiple faculties arose in Istanbul, Elazığ, and Bursa.[26,27] Specialized programs in pathology, microbiology, and parasitology kept pace with biotechnological advances. Research centers (Pendik, Etlik) (Figure 9) offered diagnostic and vaccine development services.[28,29] Technological innovations like PCR testing aided disease detection.[30,31] Modern surgical methods (laser, laparoscopy, arthroscopy) improved outcomes.[32,33]

Figure 9. The building of the Pendik Veterinary Control Institute at the time of establishment. *https://vetkontrol.tarimorman.gov.tr/pendik/Sayfalar/Detay.aspx?SayfaId=45*

Advancements in the Veterinary Pharmaceutical Industry

The roots of modern veterinary pharmacology date to 1842 with the establishment of a Veterinary School.[34,35] By 1940, the first law regulating veterinary drugs was enacted, and domestic veterinary drug production increased.[36,37] This accelerated disease management and preventive care. The first regulatory framework mandated written prescriptions for veterinary drugs. During the Republic Period, the production of the first veterinary drug, Distophagine, by Mehmet Halit (Civelekoglu) Bey in 1926 marked the start of the veterinary pharmaceutical industry. By 1938, the first domestic and imported veterinary drug licenses were approved.

Role of Veterinary Medicine in Economic Development

Veterinary interventions raised yields in livestock and poultry. Effective disease control measures like vaccination reduced mortality. Exports rose, and value-added animal products gained prominence. Veterinary medicine was essential to the growth of livestock and poultry industries. Better animal health and productivity increased yields of meat, milk, eggs, and other products, while veterinarians offered services such as disease prevention, reproductive management, and nutritional guidance.[38,39] Effective disease control measures—vaccination programs, parasite control, and biosecurity practices—reduced mortality and morbidity in livestock, supporting both domestic markets and exports of high-quality animal products.

Major epidemics (e.g., Foot-and-Mouth Disease) were tackled with culling, vaccination, and research. Foot-and-Mouth Disease (FMD) was a major concern, causing economic losses in the livestock industry.[40,41] Veterinary authorities implemented vaccination programs, movement restrictions, and culling of infected animals, while researchers focused on more effective vaccines and rapid diagnostic tests. Rinderpest was managed with intensive vaccination and surveillance campaigns until its global eradication in 2011, to which Turkey contributed. Brucellosis, tuberculosis, and Newcastle Disease in poultry were also key issues addressed through testing, vaccination, and biosecurity measures.

Conclusion

The history of veterinary medicine in Turkey reflects a rich legacy of progress and innovation, evolving through distinct eras that have shaped the field into its modern form.[42] Initially focused on practical

treatments for animals essential to agriculture and transport, veterinary care found formal structure during the Ottoman Empire through schools, regulations, and standards. The infusion of European knowledge in the 19th century introduced modern education and diagnostics. Under Mustafa Kemal Atatürk's leadership, transformative reforms laid the foundation for today's veterinary institutions and public health strategies. From its foundational roots to pioneering contemporary practices, Turkey's veterinary history stands as a testament to adaptation, collaboration, and a commitment to public health, food security, and animal welfare.

ΠΕΡΙΛΗΨΗ

Η Εξέλιξη της Κτηνιατρικής στην Τουρκία: Από τους Αρχαίους Πολιτισμούς στο Παρόν

Şahin, Elif1

Η κτηνιατρική, ο κλάδος της ιατρικής που ασχολείται με την πρόληψη, τη διάγνωση και τη θεραπεία ασθενειών στα ζώα, έχει μια πλούσια και πολυδιάστατη ιστορία. Η κατανόηση της εξέλιξης των κτηνιατρικών πρακτικών είναι κρίσιμη για την εκτίμηση των προόδων και των προκλήσεων που αντιμετωπίζει ο τομέας. Στην Τουρκία, η ιστορία της κτηνιατρικής είναι άρρηκτα συνδεδεμένη με τις πολιτιστικές, πολιτικές και οικονομικές μεταμορφώσεις της χώρας. Το παρόν άρθρο στοχεύει να διερευνήσει την ανάπτυξη της κτηνιατρικής στην Τουρκία, αναδεικνύοντας σημαντικές περιόδους, προσωπικότητες και συνεισφορές που διαμόρφωσαν την πορεία της. Συνεπώς, η ιστορία της κτηνιατρικής στην Τουρκία χαρακτηρίζεται από σημαντικές προόδους και συνεισφορές σε διάφορες εποχές. Από τις πρώτες πρακτικές των αρχαίων πολιτισμών έως την ενσωμάτωση των ιατρικών γνώσεων του Ισλάμ και τις προσπάθειες εκσυγχρονισμού κατά την Οθωμανική Αυτοκρατορία, κάθε περίοδος έχτισε πάνω στις προηγούμενες. Η περίοδος της Πρώιμης Δημοκρατίας υπό τον Μουσταφά Κεμάλ Ατατούρκ έθεσε ισχυρά θεμέλια για τη σύγχρονη κτηνιατρική εκπαίδευση και πρακτική. Το μέσο και τέλος του 20ού αιώνα σημείωσαν περαιτέρω προόδους στην τεχνολογία και τις υποδομές, οδηγώντας σε σημαντικές βελτιώσεις στην υγεία και την παραγωγικότητα των ζώων. Οι Τούρκοι κτηνίατροι συνεχίζουν να συμβάλλουν καθοριστικά στη δημόσια υγεία, την ασφάλεια των τροφίμων και τη διατήρηση της άγριας ζωής, αντιμετωπίζοντας παράλληλα νέες προκλήσεις και αξιοποιώντας ευκαιρίες για καινοτομία και παγκόσμια συνεργασία.

Λέξεις Κλειδιά: *Ιστορία της κτηνιατρικής, Ανατολία, Τουρκία*

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On two Byzantine medical recipes in verse and the cultural climate of their composition. Fragments from Michael Psellus' Medical Iambic Poem and Nikephoros Blemmydes' canticle 'On Urines'

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Figure 1. The cover page of the book "Musical Uroscopy" depicting the front page of Stephnus Prtispatharius' treatise on urines. Miniature illustration, 15th cent., Ms. 3632, fol. 51r, University Library, Bologna.

Abstract

In the previous issue of Deltos,[1] we published Part A of the article entitled Greek Medical Recipes in Verse: Their Position in the World. That instalment examined the origins of versified medical recipes and presented examples from the Classical, Hellenistic and Roman periods. It concluded with the De medicamentis liber, a poem attributed to Marcellus Empiricus and dated to the 4th or 5th century AD.

In this Part B of the same article, we continue our exploration with a focus on similar recipes from the Middle and Late Byzantine periods. This section also includes examples from Medieval and Early Renaissance Latin and Islamic medical literature, thereby illustrating the intercultural context within which these Greek verses were situated. A general discussion and concluding remarks are provided at the end.

Key Words: *Parahymnography, Didactic poetry, Michael Psellus, Nikephoros Blemmydes*

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Introduction

After the 5th century AD, Greek poetical pharmaceutical recipes become difficult to trace. There appears to have been a hiatus until the 11th century, a period during which the Byzantine upper classes experienced a revival of interest in Ancient Greek literature. Composing verse had become a widespread practice, encompassing various aspects of daily life and numerous scientific disciplines. Medicine was no exception to this trend.

The most well-known medical poem of this period was authored by Michael Psellus (Constantinople, 1018-1078), a monk, politician, physician and courtier. The work, entitled *Michael Psellus' An Excellent Medical Work in the Iambic Manner*,[2] reflects not a mere literary diversion but part of a broader corpus; Psellus is known to have composed at least twenty-six poems on diverse topics.[3a,b,c] He strongly maintained that rhythm and melody were essential for didactic purposes[a], a view he elaborated in another of his works, *Εἰς τὴν εἰσαγωγὴν τῶν Ψαλμῶν* (*Introduction to the Psalms*), written in decapentasyllabic verse.

«Ὅλως δ' ἡ βίβλος τῶν ψαλμῶν ἐστὶ ταμεῖον,
παθῶν ἁπάντων φάρμακον, κοινὴ ψυχῶν ὑγεία,
συμφόρημα τῶν ἀγαθῶν, ἀνθρώποις σωτηρία.
πᾶσαν γὰρ νόσον ψυχικὴν ἐξαίρει καὶ διώκει,
τὴν ἀρετὴν συνίστησι, παύει τὴν ἁμαρτίαν,
δροσίζει, καύσωνα, μέριμναν ἐξορίζει, θλιβόμενον
παρηγορεῖ, θυμούμενον πραΰνει,
πρόσφορον ἄκος δίδωσιν ἑκάστῳ τῶν
ἀνθρώπων·καὶ τοῦτο δὲ μετὰ τινὸς ἐνθέου
μελῳδίας, μεθ' ἡδονῆς τε σώφρονος, μετ'
εὐφροσύνης θείας,
ἵνα τῷ λείῳ καὶ τερπνῷ θελγόμενοι τοῦ μέλους,
τὸ τῶν ρημάτων ὄφελος ἕλκωμεν λεληθότως—ὃ
τοῖς σοφοῖς τῶν ἰατρῶν ἔθος ποιεῖν πολλάκις ἥνικα
γὰρ τὰ πόματα κιρνῶσι τοῖς ἀρρώστοις, μέλιτι
περιχρίοῦσι τὰ τῶν κυλίκων ἄκρα,
ὅπως ἐκ τῆς γλυκύτητος κλεπτόμενοι τὴν γεῦσιν,
δέχωνται προσηνέστερον τὴν πόσιν τῶν φαρμάκων.
οὕτως οὖν ψάλλοντες ἡμεῖς δοκοῦμεν μέλος ᾄδειν·
τὸ δ' ἀληθὲς παιδεύομεν τὰς ἑαυτῶν καρδίας καὶ
μνήμην ἀνεξάλειπτον ἔχομεν τῶν λογίων.
ἐπεὶ γὰρ πάντες ἄνθρωποι τοῖς μέλεσι κηλοῦνται,
κρατεῖ δὲ ἐν τούτοις ἡδονὴ ῥευστοῖς τὴν φύσιν οὖσι,
τὸ ῥᾴθυμον δ' ἀπόλλυσι τὴν μνήμην τῶν ρημάτων,
ἕνεκεν τούτου τοῖς ψαλμοῖς τὸ μέλος εἰσηνέχθη,
τὸ τῶν φαρμάκων αὐστηρὸν τῶν γραφικῶν
καὶ θείων, μέλιτος δίκην ἀλλοιοῦν καὶ
καταφαρμακεῦον,
καὶ τῷ γλυκεῖ τὸ χρήσιμον εὐτέχνως παραρτύον—
καὶ γὰρ τὸ χαριέστατον ἡδέως ἐπεισδύνον πάντως
καὶ μονιμώτερον καρδίαις ἐφιζάνει.
ὅτι δ' οἰκείως ἔχομεν φύσει πρὸς μελῳδίαν, τοῖς
βουλομένοις ῥᾴδιον μαθεῖν ἐκ τῶν πραγμάτων·
καὶ γὰρ κλαυθμηριζόμενα πολλὰ τῶν βρεφυλλίων
μητέρες κατεκοίμησαν ὑπὸ τῆς μελῳδίας.»[5]

English Translation:

King David, the God's ancestor, the Psalmist,
The Glory of the Lawgivers and Prophets and Generals
In general, the book of psalms is a treasury:
a remedy for every passion, a shared health of souls,
a storehouse of every good thing, a salvation for humankind.
For it uproots and banishes every illness of the soul, establishes virtue, and brings sin to a halt. It brings coolness, dispels heat and anxiety, consoles the sorrowful, soothes the angry; it offers each person the remedy suited to their condition - and all this by means of a divine melody, with restrained delight and godly joy.
So that, beguiled by the smoothness and charm of the music, we unwittingly absorb the benefit of the words. This, after all, is a practice known to wise physicians:
when they administer medicine to their patients, they coat the rims of the cups with honey,
so that, deceived by sweetness, they may more easily accept the bitterness of the drug.
In the same way, when we chant, it may seem we are simply singing melodies - yet in truth, we are training our hearts
and imprinting an indelible memory of the words.
For all human beings are enchanted by song, and pleasure holds sway over our fluid nature;
while lethargy, by contrast, erases the memory of speech. This is why melody was joined to the psalms:
to temper, like honey, the severity of sacred and divine writings,
to transform them and render them medicinal,

a Didacticism refers to a particular philosophy in art and literature which holds that various forms of artistic and literary expression should serve not only to entertain but also to instruct and convey knowledge. Didactic verses were often considered especially valuable when accompanied by music, which enhanced their mnemonic and pedagogical effectiveness.[4] A remote ancestor of such didactic poetry is Hesiod's *Works and Days*, composed circa 700 BC. Written in dactylic hexameter, the poem consists of 828 lines and exemplifies the union of instruction and poetic form.

and, through sweetness, to craftily convey what is beneficial.
Indeed, what enters gently and with pleasure
takes root more deeply and more lastingly
in the heart.
And that we are by nature attuned to melody
is plain from experience:
many a mother has lulled a crying infant to sleep with a song

Although Psellus is not regarded as a standard hymnographer, he did compose a hymn in honour of Symeon the Translator, beginning with the verse *"Having achieved a life full of God…"*.[6] Within this cultural context, Psellus' *Medical Poem* was neither paradoxical nor a rare whim. Rather, it was consistent with his aesthetic sensibilities, rhetorical and medical training, and the intellectual climate of the Middle Byzantine court.[7]

The second manuscript under consideration was composed in the 13th century by Nikephoros Blemmydes, during the period of the Empire of Nicaea—a successor state to the Byzantine Empire, which had fallen to the Fourth Crusade in 1204. The work is entitled *Στιχηρὰ εἰς τὰ κρίσεις τῶν ὑελίων τῶν δεκατριῶν* (*Stichera on Distinguishing Between the Thirteen Kinds of Urine Vials)* [According to Colour]. It comprises a series of diagnostic, prognostic and therapeutic guidelines based on the colour and sediment of the patient's urine.[8]

Materials and Methods

In the current article we elaborate on:

A. Treatments recommended by Psellus as part of a dietary regime, as found in his poems:

1. *"περὶ λουτροῦ"*[9]
2. *"Περί Διαίτης»*[10]
3. *'Πόνημα ἰατρικόν ἄριστον δι' ιάμβων"*[11]

Additionally, we examine Nikephoros Blemmydes' *Στιχηρὰ εἰς τὰ κρίσεις τῶν ὑελίων τῶν δεκατριῶν*. Only those extracts from the canticle that pertain to treatment are presented.

As material, for the latter we have used the translated verses published in Bouras-Vallanatos' article in *Deltos*, which also contains the original Greek texts. Extracts were further drawn from three of my own books,[12-14] in which I had previously presented the relevant sections of Psellus' *Medical Poem* concerning only the examination of urine, in comparison with Avicenna's medical poem. The entirety of Blemmydes' canticle, including an extensive introduction and discussion, were also included. Sources for all additional content are provided in the References section.

B. Islamic medical poems concerning therapeutics

C. Comparable Latin texts

Sections B and C will be addressed briefly and selectively, with the aim of contextualising the Byzantine material within its broader intercultural environment.

Results

The Greek originals and the English translations follow:

A.

1. *"Περί λουτρού"* Τοῦ λογιωτάτου Ψελλοῦ

Original (Polytonic Greek)

Πολλῶν τὸ λουτρὸν αἴτιον δωρημάτων·
χυμῶν κατασπᾷ, φλέγματος λύει πάχος,
χολῆς περιττὸν ἐκκενεῖ τῶν ἐγκάτων,
τὰς θελξεπίκρους κνησμονὰς καταστέλλει.
τὴν βλεπτικὴν αἴσθησιν ὀξύνει πλέον,
ὦτων καθαίρει τοὺς πεφραγμένους πόρους,
μνήμην φυλάττει, τὴν δὲ λήθην ἐκφέρει,
τρανοῖ δὲ τὸν νοῦν πρὸς νοήσεις εὐθέτους.
Ὅλον τὸ σῶμα πρὸς κάθαρσιν λαμπρύνει,
ψυχῆς τὸ κάλλος προξενεῖ πλέον λάμπειν,
τοῖς εὐσεβῶς μάλιστα τούτῳ χρωμένοις
δι' ἀσθένειαν σαρκίου πολυνόσου.
λούεσθε τοίνυν εὐσεβῶς, καθὼς θέμις,
μὴ σπαταλικῶς (καὶ γὰρ ἐγγὺς ἡ κρίσις).

English translation

By the most learned Michael Psellus "On Bathing"
Bathing is a fountain of many benefits:
it draws off noxious humours, thins the stubborn phlegm,
expels the surplus bile from the inward parts,
and soothes those bittersweet itches of the skin.
It sharpens sight still further,
unclogs the blocked channels of the ears,
guards the memory and banishes forgetfulness;
it clarifies the mind, fitting it for keen conception.
It brightens the whole body through its cleansing power
and makes the beauty of the soul shine all the more
especially in those who, weak and oft-ailing in flesh, turn to it with reverent care.
Bathe, then, with moderation and due respect,
not wastefully or in excess(for the Hour of Judgment is ever near).

2. "Περί Διαίτης» Τοῦ λογιωτάτου Ψελλοῦ Κωνσταντινουπόλεως

Original (Polytonic Greek)

Ἄριστον ἀρίστησον ἐκτὸς τοῦ κόρου,
καὶ δεῖπνον ἐδείπνητον ἐστενωμένον.
πάντων λαχάνων, ὀσπρίων μικρὸν λάβε·
πασῶν ὀπώρων πλησμονὴν ἀπότρεπου·
κραμβοφαγῆσαι, βραχυφαγῆσαι θέμις.
μίσει τὸν ὄκνον ὡς σατανᾶν, ὡς ὄφιν·
δειλῆς τὸν ὕπνον οὐ καλὸν ποθεῖν ὅλως·
παραρριπισμῶν προσβολὴν ἀπότρεπου.[15]

English Translation

Regimine, By the most learned Psellus of Constantinople

Make your lunch excellent, yet free of excess;
keep supper spare and closely measured.
Of every kind of vegetables and pulses take but a modest share;
from all fruits steer clear of over-indulgence.
To dine on cabbage, to dine in small amounts, is right.
Abhor idleness as you would Satan, as you would a serpent.
The late-day nap is no good - do not desire it at all.
Drive away every sudden, heedless impulse

3. Πόνημα ἰατρικόν ἄριστον δι' ἰάμβων". Extracts form his Medical Poem concerning the culinary and medicinal properties of several vegetables, and fruits

Original (Polytonic Greek)

Αὕτη πέφυκε λαχάνων ἡ ποιότης.
Ὑγρὰν ψυχρὰν τε τὴν θριδακίνην νόει,
γεννῶσαν ἡδὺν ὕπνον, εὔτροφον φύσει·
ἔχει δὲ ταύτας καὶ φύσις τῶν ἰντύβων
τὰς ποιότητας, ἀλλ' ὅμως τεθραυσμένας.
Ἡ μαλάχη ψύχει μέν, ἀλλ' ἐλαττόνως,
ὑγρὰν δὲ ποιεῖ τὸ πλεῖον τὴν γαστέρα,
ὑπακτική τε τῆς περιττῆς γαστέρος.
Ψύχει τὸ τεῦτλον, ἐκκενεῖ τὴν γαστέρα,
δάκνει στόμαχον, ἧπαρ εὐρύνει πλέον.

Κράμβη δίσεφθος δεσμὸς ἐστὶ γαστέρος,
ἡ δ' αὖ μόνεφθος ἁλσὶν ἐμμεμιγμένη
ὑπακτικὴ πέφυκε τῶν ἐγκειμένων.

Ἡ δ' ἀτράφαξις, προστίθησι καὶ τὸ βλῖτον,
ὑγρὰ μέν ἄμφω καὶ λύοντα γαστέρα,
ἀλλ' ἄτροφον τὸ σῶμα δεικνύντα πως.

Ἀτρακτυλίς, σκόλυμος, ἡκανθωμένα
τροφίμα καὶ σύμμετρα γαστρὸς τῇ κράσει·
ἡ κινάρα δὲ δυσστάμαχος τυγχάνει.
Οὐρητικὰ σέλινα, σμύρνιον, σίον.
Κάρδαμον ἠδ' ὤκιμον, ἀλλὰ καὶ νάπυ,
ἅπαντα θερμὰ τυγχάνει καὶ δριμέα,
δυσπέπτα, δυσστάμαχα, πλειστόχυμά τε.

Ἡ δ' ἀκαλύφη, καὶ κνίδη καλουμένη,
λεπτή τις ἐστίν, ἐκκενεῖ τὴν γαστέρα.
Τὸ δ' αὖ γε γιγγίδιον ἐμφύτως στυφὸν ἄριστον,
εὔστομαχον εἰς ἀποτρόφους,
εὔσιτον, εὔορεκτον, οὐ σάρκας τρέφον.
Ἐκφρακτικὴ κάππαρις, ἡδίστη πλέον,
δοκεῖ μιγεῖσα φλεγμάτων ἀναιρέτις.

Ὅρα δὲ καινὴν φύσεως ποικιλίαν:
βλῖτοι, μαλάχαι, τεῦτλα καὶ θριδακῖναι
ὑγρὰ μέν εἰσι τοῦ φυτοῦ τὴν οὐσίαν,
ξηρὸς δὲ τούτοις ἀσπάραγος τυγχάνει.
Ἡ δ' ἂν ῥαφανίς, γογγύλη τε καὶ νάπυ,
τὸ κάρδαμον, πυρέθρον, ἡ κράμβη πλέον,
τὸ μὲν φυτόν φέρουσιν ἐξηραμμένον, ἔχουσι
δ' ἀσπάραγον ὑγρὸν τὴν φύσιν.
Ἡ γογγύλη δὲ, βουνιᾶς κεκλημένη,
τροφίμος, εἰ δίσεφθος·
εἰ δὲ πολλάκις γεύσαιο ταύτης,
δυσστομαχήσεις πλέον.
Ὀρεκτικὴ πέφυκεν ἡ βολβοῦ φύσις,
τὴν γαστέρα ῥίπτουσα καὶ τονοῦσά πως,
τροφίμος, εἰς ἔρωτας εὐφυεστέρα,
γεννητικὴ τε πνευμάτων καὶ σπερμάτων.
Πράσα τε καὶ σκόροδα, τὰ κρόμμυα τε πάντα,
δριμύττει καὶ τέμνει καὶ λεπτύνει.
Ἄποιον ὕδνον καὶ καταψῦχον πλέον·
οἱ δ' αὖ μύκητες φλεγματώδεις τὴν φύσιν·
οἱ δ' ἀμανῖται τοῦτο πῶς ἐλαττόνως.
Τῶν ὀσπρίων δ' αὖ τὴν φακὴν ἀποτρέπου·
μελάγχολος πέφυκε, δεσμὸς γαστέρος.
Κοῦφοι κύαμοι καὶ φυσώδεις τὴν φύσιν.
Ὁ δ' ἐρέβινθος ῥυπτικὸς τε τυγχάνει
καὶ σπέρμα γεννᾷ καὶ λίθους διαθρύπτει.
Τὰ θέρμια δύσπεπτα.
Τὰ θέρμια ἡ πόα θερμὴ πέφυκε,
προτρέπει τὴν γαστέρα.
Ὁ δ' ἂν φάσουλος καὶ τροφίμος τυγχάνει,
κενωτικὸς τε τῶν περιττῶν ἐκτόπως.
Ἡ φάσουλος καὶ λύει τὴν γαστέρα,
ψῦξίν τε γεννᾷ καὶ καθυγραίνει πλέον.
Πέπων κακοστόμαχος, ἧττονως τρέφων.
Ὁ σικυὸς δύσπεπτος, ὑγρὸς τὴν φύσιν.
Σῦκον, σταφυλαῖ καὶ τρέφουσιν ἥρεμα,
ἧττον τε δυσστάμαχα, πλειστόχυμά τε.
Τῆς δὲ σταφυλῆς εὔχυμώτερον σῦκον,

νεφροὺς καθαίρει καὶ κενεῖ τὴν γαστέρα.
Αἱ δ᾽ ἰσχάδες σύμπαντα πρὸς τοὐναντίον,
ὠμοὺς χυμοὺς τίκτουσι, πληροῦσι φύσεως·
τῶν δὲ σταφυλῶν ἡ σταφὶς σοι βελτίων.
Τὰ συκάμινα ψυχροποιὰ μετρίως,
τίκτουσι δ᾽ ὑγρότητα πολλὴν ἐν βάθει.
Ἡ δ᾽ ἄν γε διττὴ τῆς κεράσου ποιότης
διπλοῦς ὁμοίως τοὺς χυμοὺς παρεισάγει·
ἡ γὰρ γλυκεῖα τῆς ὀπώρας ποιότης
βλάπτει στόμαχον, ἐκκενεῖ δὲ γαστέρα,
ἡ δὲ στυφουσᾶ τῷ στύφειν τὴν γαστέρα φθείρει,
στόμαχον οὐχ ὑπεῖσιν οὐδ᾽ ὅλως.
Ὁ κωνικὸς στρόβιλος εὔχυμος φύσει.
Μῆλον γλυκάζον καὶ τροφίμον τυγχάνει
καὶ θερμὸν ἐστὶ μᾶλλον ἐξωπτημένον.
Κυδώνιον δὲ ῥωστικὸν μὲν τυγχάνει,
ἐφεκτικὸν δὲ ἐστὶ τῆς γαστρὸς πλέον.
Ῥοιά ψύχει, μέσπιλα τὸ πλεῖον στύφει.
Ῥοιά ψύχει, μέσπιλα τονοῖ στόμαχον
ἑστεγνωμένος, ἐφεκτικὸς δέ ἐστι γαστρὸς
ἐκτόπως.

English Translation

This is the quality of vegetables.
Lettuce is moist and cold; it brings sweet sleep and is naturally nourishing.
Endive shares these qualities, though weaker.
Mallow also cools, though more mildly; it moistens the stomach and acts as a laxative.
Beetroot cools and empties the stomach, but can irritate it and affects the liver more strongly.
Cabbage, if boiled twice, causes constipation;
if boiled once with salt, it acts as a purgative.

Atraphaxis and amaranth blitum are moist and laxative,
but seem not to nourish the body sufficiently.
Atractylis and scolymus are mildly thorny plants, suitable as food and well-matched to the stomach's balanced temperament.
The artichoke, however, is hard to digest.

Celery, smyrnium, and water-parsnip are diuretics.
Cardamon, basil, and lampsane are hot and pungent, indigestible, heavy on the stomach, and produce abundant humours.

Akalyphe, also known as nettle, is light and purgative.
Wild carrot is by nature very astringent, suited to dieting, easy on the stomach, appetising, but does not add flesh.
Caper is astringent and very pleasant; when mixed in, it helps expel phlegm.

Notice nature's intriguing variety:
Amaranth blitum, mallow, beetroot, and lettuce are all moist in substance,
yet their shoots are dry.
Radish, turnip, lampsane, cardamom, feverfew, and cabbage may appear dry in form, yet they possess moist shoots.
Corn rocket, also called bunias, is nourishing but constipating; if eaten frequently, it upsets digestion.
Bulbs are naturally appetising; they stimulate and invigorate the stomach,
they are mildly nourishing, stir erotic desire, and promote libido and semen.
Leeks, garlic, and onions are all pungent; they irritate, cut, dissolve, and thin.
The common truffle is tasteless and cooling;
fungi in general are phlegmatic in nature, though amanitae are somewhat less so.
Of legumes, avoid the lentil; it causes melancholy and binds the bowels.
Broad beans are light but gassy.
The chickpea is purgative, stimulates semen, and breaks up kidney stones.
Lupins are hard to digest. The grass lupin by its nature is hot and stimulates the gut.
Common beans are nourishing and purge excess matter from the body.
They also loosen the stomach, induce cooling, and hydrate the body.
Melon is bad for the stomach and less nourishing.
Cucumber is indigestible and moist by nature.
Figs and grapes are gently nourishing, less burdensome on the stomach and rich in juices.
The fig is juicier than the grape, purges the kidneys, and clears the bowels.
Dried figs do quite the opposite: they produce dense humours and burden the body.
Of the grapes, the raisin is better for you.
Sycamore figs cool moderately and produce abundant internal in depth moisture.
Cherry, having a dual nature, introduces both types of juices:
its sweetness harms the stomach but cleanses the bowels,
while its astringent nature harms the stomach but does not affect the belly at all.
The pine cone is juicy by nature.
The apple is sweet, nourishing, and becomes warmer when baked.
The quince is fortifying and helps restrain the functions of the stomach.

Pomegranate cools; medlars are mostly astringent. Pomegranate cools again; medlars tone the stomach when dry and, in their peculiar way, hinder the digestive process.

B. Nikeforos Blemmydes' or Maximus Planoudes' canticle

Ode 1. Tone 2. His overwhelming might once laid low in the deep all Pharaoh's host

[…] The white is the outcome of frigidity and kidney pain. The sufferer should be cured by the use of clysters; the ones made of fennel root and savoury are the most effective. Instead of applying spikenard, you can anoint [the patient] with this nice chamomile oil.

If there is no nosebleed, make a julep produced from naked barley. Strain the juice of boiled jujubes and sandalwood, add sugar and boil again, and go and give it to the sick

Ode 3. On the rock of the faith.

[…] Make a poultice with egg white and fleawort together with barley flour; apply this on the patient's liver; dissolve cucumber seeds in sugar and give it to the sufferer to drink.

Let [the patient] drink barley water when thirsty together with sour apples and vine tendrils; let [the patient] receive a cold clyster made of barley flour and a mixture of violet with sugar; if you have drosaton [i.e. rose syrup], give it to [the patient]; it is very good.

Ode 4. From a Virgin you came.

[…] Prepare a poultice similar to the one above, give it to the man and let him drink something sweeter; then, he can be cured by means of a clyster with absolutely no salt in it.

The fifth one is the most flame-coloured like blood, as we said; for, when the two elements are mixed together, i.e. blood and yellow bile, they cloud the entire brain.

Ode 5. The enlightenment of those in darkness.

[…] So take only half a glass of vinegar and the juice of a large cucumber, together with comfrey, amaranth, and the juice of colocynth and add enough rose water to fill a glass.

Mix three egg whites with all these, then get five handkerchiefs, pulverize and squeeze them lightly, and in this way apply well-soaked plasters to the liver.

Administer this three times a day, in the morning, afternoon and evening; give the patient, who has fasted since morning, [pulp of] tamarind fruit, safflower, and sugar to drink.

First, sprinkle him with rose water and then give him lettuce to eat as well; give the patient endive to eat and together with this [i.e. endive] give him sugar to eat, and – God willing -he will be cured.

Ode 6. Surrounded by a depth of offences.

Ode 7. The godless order of a lawless tyrant

[…] So mix the seed of lettuce, chamomile and basil seed together with barley flour and stir in beetroot juice and apply to the liver.

Apply this as a form of plaster on the forehead of the patient as well, since this will treat the patient and grant him his health

Boiling together raisins and jujubes, make a julep and give it to the sufferer; and make another julep with celery roots, lupine and chicory, to which you should add the roots of the maidenhair.

To this add one litre of sugar and give it every other day; the first day you should give the first one and then the second and so on; and then apply the juice of wild cucumber and flour of bitter vetch as a plaster.

Ode 8. The God who came down into the furnace.

[…] So apply ointments and warm plasters to the stomach; having added to them mastic gum and ladanum anoint the organs, i.e. the liver and the stomach, with oil made of rue and chamomile.

Take ginger root, galangal, clove, cumin, caraway, long pepper, spikenard, anise, pellitory, sweet flag, seeds of celery and dill seeds, and nutmeg.

Add lovage to these and nut grass and pulverise in a bowl and sieve well; add three litres of sugar together with two cups of rose water.

And put these in an empty pot and boil them with a glass of honey, and once they have thickened and blended by you, apply this as a plaster to the patient's stomach and the liver the morning and evening.

Urge him to take frequent baths and do not mix the wine with water, and if the patient drinks that, he will be freed from the disease that attacked him.

Ode 9. The Son of the Father without beginning.

[…] Roast the head of a sheep with its wool still on with nothing but salt and administer the broth as an enema; let him drink cardamom seed, galangal, and nut grass; and then venesect the leg of the sufferer immediately.

The eleventh is cloudy having sediment on the bottom [of the vial] which came from the bladder, which contains urine; and the patient has pressing dysuria due to stone or sand and he suffers.
Let him quickly drink castoreum and oregano, and let him eat pounded olive pits, octopus, vine tendrils, spikenard, galangal, seed of the chaste tree, cinnamon, and maidenhair.

C. Islamic Tradition

The 'Maysari's Encyclopaedia' is the title of a medical compendium composed in Persian verse by Hakim Maysari, a 10th-century Iranian physician. This rhymed classical text, written during the Islamic period, focuses on pharmacy and the treatment of diseases.[16] Another noteworthy example is Mohammed Ibn Takran al-Farabi (870-950 AD), who also employed poetry as a didactic tool for medical instruction. Supporting this association is the depiction of his signature on an Arabian postage stamp, stylised in the form of an Arabic musical instrument.[17]

Psellus' *Medical Poem* bears a marked resemblance to Avicenna's *Poem on Medicine* (*al- rjūzah fī al-ṭibb*), which was composed in the 11th century and translated into Latin in the 12th century by Gerard of Cremona. Avicenna's work, written in the *rajaz* metre - a poetic form in Arabic analogous to the iambic metre employed by Psellus - was intentionally crafted in simple language for didactic purposes. In the prose preface to his *Poem on Medicine*, Avicenna provides a cultural rationale for composing medical treatises in verse within the Islamic scholarly tradition. The poem was later rendered into English prose by H. C. Krueger.[18]

An example of its therapeutic prescriptions is presented below:

On purgatives and first about those which evacuate yellow bile

Scammony (III-63) strongly discharges yellow bile; the dose is a third of a drachm; it has a great action on the humors; health is improved by mixing quince (III-64) in it to avoid its harmfulness to the stomach and liver; aloes is administered in the dose of a dinar (III-65) and, then, if necessary, doubling it with drugs such as bdellium (III-66) and gum tragacanth (III-67); yellow myrobalan (III-68) is taken in the dose of an ounce and, likewise, violet (III-69) and also cassia pith (III-70), tamarind (III-71), but not to excess.

As is well known, Ibn Sīnā (Avicenna) composed nine didactic poems on medicine, the majority of which remain unedited and have yet to receive thorough scholarly attention.[19]

Didactic poetry emerged in al-Andalus as early as the first half of the 9th century, within an intellectual milieu heavily influenced by the literary and cultural paradigms of Baghdad. Medical poems and their accompanying commentaries were produced on both sides of the Straits of Gibraltar, accounting for the notable proliferation of versified texts and glosses found in Nasrid Granada and the Merinid Maghrib, as well as for the wide dissemination of Ibn Sīnā's medical poem.[20] In the 12th century, Ibn Tufail authored an extensive medical treatise in verse, composed of 7,700 lines of clear and accessible *rajaz* metre. This work is preserved in the Al-Qarawiyyin Library in the city of Fez. Within it, he systematically addressed the diagnosis of diseases, outlined their causes, and subsequently discussed the corresponding therapeutic measures.[21]

D. Latin tradition

Very similar texts were composed in the Latin West. Among the most renowned is the *Regimen Sanitatis Salernitanum*, presumably written in the 12th or 13th century, which gained widespread popularity as a didactic poem offering medical and dietary guidance. Another notable example is *Carmina de Judiciis*, a poetic treatise on uroscopy by Aegidius Corboliensis (Gilles de Corbeil), also dating from the 12th or 13th century and composed in Latin hexameters. Equally influential was a Latin verse herbal attributed to an eleventh-century writer living in France, commonly identified as Odo de Meung, though known pseudonymously as *Macer Floridus*. Portions of an English verse herbal and elements of a fourth prose text are also derived from versions of the *Macer* herbal. These examples attest to the continued circulation of Latin medical verse throughout the later Middle Ages, alongside the emergence of new translations—both in verse and prose—into the vernacular.Of the aforementioned texts, John Lydgate's *The Dietary* (15th century), which draws in part on the widely copied *Regimen Sanitatis Salernitanum*, survives in the greatest number of manuscript copies. The following headache remedy is excerpted from a substantial, late fifteenth-century remedy book, which features an intermingling of verse and prose prescriptions:

Old English

A medycyn here I have in mynde.
For hedde werke to telle as I fynde.
To take ayeselle and puliolle ryalle.
And camamylle and seethe hit withe alle.
that iouce anoynte thy nassethrellis welle.
And make a plaster of that othere deele.

And doo hit in a goode grete clowte.
And wynd the hedde therewithe abowte.
So sone as hit is layde thereon.
Alle the hedde werke awaye schalle gon.

Modern English

I have a remedy in mind here, one I have found for headache:
take vinegar, pennyroyal, and chamomile, and boil them all together.
With the strained liquid, anoint your nostrils thoroughly;
from the remaining mash make a poultice.
Place the poultice in a clean, sturdy cloth
and bind it firmly around the head.
As soon as it is set in place,
all the head-pain will swiftly depart.[22]

In the Royal Library of Stockholm is preserved manuscript X.90 (also known as Kungliga Biblioteket, handsktift X.90 or 10.90), an early fifteenth-century manuscript renowned for its Middle English medical texts. It contains a valuable collection of 140 versified recipes. An example for the treatment of dropsy is provided below:

For þe cold[e] dropesye. [380]

Alia medicina

Anoþer medycyne I fynde wrete alsoþat to þe cold dropesye is good to doo:

Alisawndir, betonye and fenkele do take, [*419 betanye Hs.*]

With aneyce [a] ȝewene porcyoun late make [420] [P. 45] [*420 anence Hs.*]
And in a lynen cloth these gresys be take, [385]
It must be sothyn in good olde ale;
And late hym drynkyn dayes seweneEuerilke a day a porc[i]oun ȝewene.[23]*]*

In a parchment and paper manuscript copy of the Livre des simples médecines, i.e. the French adaptation of the Circa instans attributed to Platearius, there were recipes for Charles the Bold and Jean de Bourbon, abbot of Cluny, and the verse entitled Virtutes Agnus Dei, written and illustrated in Northern France.[24]

In 11.f. 298r-v: A verse recipe against an epidemic (the plague?) for Herzog Karl dem Kühnen [i.e. Charles the Bold] (1433-1477; r. from 1467), followed by prose commentary, in French. f. 305r: Virtutes Agnus Dei, verse (11 lines)[a]. Agnus Dei means "The Lamb of God," The text reads: (Guillaume Dufay (c1400 - 1474), "Balsamus et munda cera", 1431)

The original Latin

Proprietas agni dei / Barsamus [for Balsamus] et cera munda cum crismatis vnda / Conficiunt agnum quem do tibi munere magnum / F[on]te velud natum, per mistica sanctificatum / Fulgura de sursum depellit et omne malignum / Pregnant servatur sine ve partus liberatur / Portatus munde sanat a fluctibus vnde / Peccatum frangit ut Christi sanguis et vngit / Dona confer dignis virtutes destruit ignis / Morte repentina servat Sathane que ruyna / Si quis adorat eum retinebit ab hoste triumphum / Agnus dei miserere mei qui crimina tollis / Amen.

English translation

*Balsam and clear wax,/Water with consecrated oil,/ These make the [model of a] lamb[1] which I give to you/ Great as a gift/Born as if from the source,/Sanctified through holy rites;/It deflects thunderbolts from above[2] and every ill;/The mother giving birth is protected,/ She emerges from the birth without pain;/The baby she bears is protected by waves of clear water;/[The lamb] shatters and strangles sin like the blood of Christ, /It brings gifts to those worthy of them, and destroys the power of fire /It protects from sudden death and Satan's destruction./Alleluia.**

The verse describes the virtues of balsam, a spice imported from the East (mostly Egypt) and used as a balm both for healing and for the administration of religious sacraments.

Translation © by David Wyatt, reprinted with permission from the LiederNet Archive, in: www.lieder.net › lieder › get_textBalsam and clear wax

One example in the Irish tongue (15th-16th cent) is found in a stanza from a poetic remedy for headache:

a The Agnus Dei was represented by a wax disk impressed with the image of a sheep. During a sanctification ritual the Pope the approaches the Agnus Dei, which are placed in baskets. […]the most senior Cardinal ministering the ampoule of Balsam, which the Sacrist hands to the Cardinal, the Supreme Pontiff pours the Balsam from the ampoule into the Water, in the form of a cross.[25] There is similarity with the Lemnian Earth, a cure all medicament from the 1st cent BC till the 20th cent AD. "It comes from a cave-like hollow on the island Lemnos. It is dug out there and mixed with goat's blood, the people form it to pills and seal those with a seal with a goat on it, called 'goat's seal'.[26] Galen was more specific about the preparation of the seal by the priestess *"[…] She now dries the fatty mud until it reaches the consistency of **soft wax**; of this she takes small portions and imprints upon them the seal of Artemis[…]"* This similarity has not been reported before.

Lūait uinnsend a ngemrid garg
odrad inniga imard
do mēt na losa – cōir cain –
īcaith gach aon rē naomaid. (RIA 445 (24 B 3) p.44, 27–28)

The English translation

Ashes of an ash tree in harsh winter
very tall bugloss,
an equal measure of the herbs – proper and fine –
It cures everyone within nine days. (translated by Barret)[27]

Discussion

In Byzantium

The *Πόνημα ἰατρικόν* by Michael Psellus is a didactic poem on medicine. In a brief passage, introduced between verses 531 and 537, the author states that his aim is not to encompass the entirety of medical knowledge, but rather to awaken an interest in the subject among his learned peers through the charm of verse. Psellus' selection of medicinal plants in his versified recipes largely follows those found in Dioscorides' *Materia Medica*, and, notably, in the same sequence - a feature not previously observed. Furthermore, the names of pepper and sugar - both relatively late introductions - appear four and eight times respectively. This repetition is indicative of the growing pluralism in the availability of materia medica during the Late Byzantine period, in which Greek and Byzantine traditions were increasingly interwoven with Arabic medical knowledge, particularly in the domains of diagnostics and pharmacology.[28]

As noted in the poem's inscription, it was composed in the iambic manner. However, this is only partially accurate. Iambic metre traditionally refers to a poetic line composed of iambs - a metrical foot consisting of an unstressed syllable followed by a stressed one. Over time, however, the metrical precision of classical prosody diminished in importance, leading to the collapse of distinctions between long and short syllables. As a result, what was formerly iambic trimeter gave way to the Byzantine twelve-syllable line. These verses, therefore, are essentially composed in the Byzantine twelve-syllable metre, although they retained the classical designation iambos.[29a]

a This is yet another example of the ambivalent relationship the Byzantines maintained with Ancient Greece. They refused to acknowledge its demise or to lay it to rest. Despite persistent claims regarding Christian hostility towards the ideals of classical beauty, the Byzantines preserved the vestiges of Antiquity, striving - through poetry, sophistry, and scholarly treatises- to keep its legacy close to them.

This form is based partly on classical prosody and partly on tonal accent. It typically consists of twelve syllables, in which the 3rd, 7th, and 11th syllables are always short; the 2nd, 4th, 6th, 8th, and 10th are long; and the 1st, 5th, 9th, and 12th may be either long or short. A distinguishing feature of the iambic twelve-syllable is the paroxysmal cadence, whereby the penultimate syllable of each line bears the principal stress.[30,31]

Psellus elaborated on this metre - then popular at court - and composed a short poem to illustrate the iambic form with an example:

Original (Polytonic Greek)

Του σοφωτάτου Ψελλού στίχοι όμοιοι περί ιαμβικού μέτρου (De metro iambic) p. 236

"[…] Έστωσαν ούν πυρρίχιος μεν «λόγος», σπονδείν «Ἄτλας» εκ μακρών λόγων δύο «Λάχης» δ' ίαμβος και «λέβης» αύ και «Θέων» Ιδού το πάν είληφας εν βραχύ μέτρω[b]*'*

English Translation

The wisest Psellus' identical verses about the iambic metre (De metro iambic) p. 236

"[…] They stand for pyrrihios "word" for spondee "Atlas" consisted from two long syllables "Lachis" on the other hand iamb and "cauldron" and again "Theon"

Michael Psellus glorified the poetical mode of medical treatises writing: '[…] and uroscopy frequently suffices to show the future as the Pythian tripod'.[32]

Uroscopy was thus regarded as being on a par with the prophecies of the Delphic Pythia, who delivered her oracles while seated upon her tripod. In poetic discourse, this figure of the Pythia is frequently invoked, as is, in similar contexts, the practice of uroscopy. (Figures 2 and 3). It was at Delphi that Plutarch staged a comparable scene: an engaging confrontation between the esteemed, versified oracles of the Pythian past and the prose oracles characteristic of his own time, reflecting a more prosaic reality.[33]

Another widely used poetic metre was the *decapentasyllable* (fifteen-syllable line), also known as *political verse*. This form flourished from the ninth or tenth century through to the nineteenth and twentieth centuries, and it remains in use today, chiefly in the context of traditional folk songs. The term *political*

b Red letters denote a short syllable, the underlined letters a long one.

originally signified *civil* or *civic*, and at the time denoted something pertaining to everyday people.[1] The term appears as early as the eleventh century, though it was likely in circulation earlier. Psellus was well acquainted with political verse and employed it extensively. A short admonitory poem addressed to Emperor Constantine IX Monomachos bears the title: *Στίχοι Πολιτικοὶ πρὸς τὸν βασιλέα κύρον Κωνσταντῖνον τὸν Μονομάχον περὶ τῆς γραμματικῆς* (*Political Verses to Emperor Kyr Constantine Monomachos on Grammar*).[34]

Over time, the *politicoi decapentasyllable* came to be widely accepted, while the archaic iambic dodecasyllable gradually declined. Thus, Blemmydes' canticle *On Urines* is composed in political verse, although it does not consistently conform to the fifteen-syllable structure - a characteristic feature of Byzantine verse, which did not always strictly adhere to metrical rules. In Byzantium, it was music - and poetry- that were employed to enhance the texts, whereas in Western Europe the reverse was generally the case.[35] This canticle serves as a typical example of a canon composed of nine odes, each consisting of three to six canticles, following linear hymns. Preceding each ode, the corresponding ecclesiastical canticle is cited, indicating the manner in which the specific ode should be chanted.

The first two modern performances of the poems by both Blemmydes and Psellus were organised by the author of this article. The *Canon on Urines* was first chanted by the monks of the Holy Transfiguration Monastery in Nafpaktos, Greece, in 1998. It was subsequently performed in the form of an oratorio - together with excerpts from Michael Psellus's *On Medicine* - by the Polyphonic Choir of Patras, with Andreas Skarpelos as soloist, in Delphi on 15 February 2001.[36] A third performance, intended for an international audience, was organised independently of our contribution by Bouras-Valianatos and Skrekas in 2014.[37]

In Islam, too, there existed a close relationship between medicine and music.[38] This relationship was twofold. On the one hand, music was employed for therapeutic purposes, particularly in the treatment of psychological illnesses; on the other, a theoretical discourse developed concerning the relative value of music and poetry in relation to the study of the sciences. In most manuscripts, the poem of the treatise *On Urines*, is accompanied by a prose treatise on uroscopy. Notably also, Latin manuscripts containing metrical works on uroscopy are likewise accompanied by prose texts on urine. As becomes evident from the above, the metrical oration functioned in the past in a manner akin to what we would now describe as the *abstract* of a scientific survey or treatise - typically distinguished by a different typeface from the main body of the text. Generally, in the Latin West medical poetic recipes were in abundance in the Late Middle Ages and the Early Renaissance. Initially written in New Latin and then hesitantly in the local tongues

Conclusions

The medical poems of Psellus and Blemmydes are by no means unique. Poetic recipes circulated widely during their respective eras, both in the East

Figure 2. The lower part of Nicoalaos Myrepsos' Dynameron frontpiece. The sitting doctor examining the urine in the matula while the invalid parient anxiously awaits his verdict. De Compositione medicamentorum.·(13th cent.?), Bibliotheque Nationale, Paris, France

Figure 3. Themis, prophetic goddess of Delphi, prophesies by looking at the basin with the water of Castalia. She sits on the Pythian tripod, while in front of her Aegeus anxiously awaits the oracle. Interior of a red-figure calyx, 5th c. B.C. Berlin, State Museums

and the West. Blemmydes' incorporation of lyrics into *stichera* was innovative, although this practice had already found limited application in other scientific disciplines from the twelfth century onwards. Psellus did not compose pharmaceutical drug recipes in verse; however, in his three poems, with a fine aristocratic tone, offers guidance on diet and bathing, which may be regarded as equivalent to therapeutic regimens. These belong to a long-standing tradition of advice aimed at preserving or restoring health. Such writings are the Greek descendants of Hippocrates' *Regimen* and the Latin successors of the later *Regimen Sanitatis*. Their Islamic counterparts derive primarily from Avicenna's *Poem on Medicine*, although mutual influences are evident.

But did such poems offer genuine therapeutic value? A common methodological error lies in evaluating the medicine of that period through the lens of modern biomedical standards. Every cultural achievement must be assessed in relation to others of its own kind. From the evidence presented thus far, it becomes clear that neither the Latin West nor the Arabic East possessed superiority in therapeutic knowledge over that which emerged from Byzantium. On the contrary, the Byzantine contribution appears, at least for substantial periods, to have held precedence.

A second general observation is that major intellectual figures such as Psellus and Blemmydes would not have endorsed or reproduced views on such critical matters as human health without some degree of practical validation. A more detailed analysis of these texts from microbiological, nephrological, and pharmacological perspectives is warranted. We have undertaken such an approach.[39,40] A detailed supplement concerning the therapeutic properties of all the plants mentioned in *Deltos 2* and *Deltos 3* is currently in preparation for publication.[41]

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ΠΕΡΙΛΗΨΗ

Δύο Βυζαντινές ιατρικές συνταγές σε στίχους και το πολιτιστικό κλίμα για την σύνθεσή τους. Αποσπάσματα από το «Ιατρικό Ποίημα δι᾽ιαμβων» του Μιχαήλ Ψελλού και του κανόνος του Νικηφόρου Βλεμμυδη

Αθανάσιος Διαμαντόπουλος

Στο προηγούμενο τεύχος του Δέλτου δημοσιεύσαμε το Μέρος Α᾽ του άρθρου «Ελληνικές ιατρικές συνταγές σε στίχο. Η θέση τους στον κόσμο». Σε αυτό, συζητήθηκε η προέλευση των έμμετρων ιατρικών συνταγών και παρουσιάστηκαν παραδείγματα από την κλασική, ελληνιστική και ρωμαϊκή περίοδο. Τελείωσε με το ποίημα του 4ου/5ου αιώνα μ.Χ. De medicamentis liber του Μάρκελλου Εμπειρικού Στο Β μέρος του ίδιου άρθρου, συνεχίζουμε να διερευνούμε παρόμοιες συνταγές από τη Μέση και Ύστερη Βυζαντινή περίοδο. Αυτή η ενότητα θα περιλαμβάνει επίσης παραδείγματα από τη μεσαιωνική λατινική και ισλαμική ιατρική λογοτεχνία, που απεικονίζουν το διαπολιτισμικό πλαίσιο στο οποίο βρίσκονταν αυτοί οι ελληνικοί στίχοι. Μια γενική συζήτηση και συμπεράσματα θα δοθούν στο τέλος.

Λέξεις Κλειδιά: *Παραϋμνογραφία, Διδακτική ποίηση, Μιχαήλ Ψελλός, Νικηφόρος Βλεμμύδης*

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Herbal Wisdom and Practical Solutions: A Comparative Study of Abdominal Pain and Acute Intestinal Obstruction Treatments in versified Ibn Tufail's Al 'Urjuzah Fi Al Tibb and Other Classical Islamic Medicine Texts with emphasis on Posology

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Figure 1. View of Al Urjuza Fi Tibb by Ibn Tufail preserved at the library of Al Quaraouiyine University in Fez.

Introduction

From the ninth to the nineteenth century, didactic poetry in the Islamic world encompassed a wide array of subjects, including theology, Qur'ānic studies, jurisprudence, history, logic, algebra, medicine, and agriculture. These poetic forms were crafted to engage audiences while effectively preserving and transmitting knowledge. Medieval Arabic poetry also explored the ethical, social, and humanitarian dimensions of medical care, as seen in works like the 13th-century bibliographic encyclopaedia by Ibn Abi Usaibia, which contains numerous quotations reflecting these themes.

Among the notable works of medieval Arabic medical poetry, Ibn Tufail's *Al 'Urjuzah Fi Al Tibb (Fig. 1)*, preserved in the Al-Qarawiyyin library in Fez (Fig. 2), stands out for its comprehensive approach to medical treatments. This poem presents detailed recipes and therapeutic strategies, particularly addressing the treatment of abdominal pain and acute intestinal obstruction.

[1]MD, Heritage Committee. Medical Faculty of Fez. University Sidi Mohammed Benabdellah, Fez, Morocco
Note: The translation of Arabic verses into English was provided by the author

Additionally, this analysis will explore the concept of posology - the science of drug dosage - which is essential for understanding appropriate treatment dosages. Posology has played a crucial role in refining medical practices, yet it has faced challenges, including variability in measurement units and the evolution of these standards over time.

Material:

Ibn Tufail, a prominent Arab Muslim philosopher, scientist, and physician, made significant contributions across various fields, including philosophy, literature, mathematics, astronomy, and medicine. His diverse career path included roles such as a clerk in the governor's office in Granada, as well as minister and private physician to Sultan Abu Yaaqub Yusuf. Renowned for his medical expertise and his close association with fellow scholar Ibn Rushd, Ibn Tufail passed away in Marrakesh in 581 AH / 1185 AD, leaving behind a legacy of invaluable works.

His contributions to medicine have been documented by historians such as Lisan al-Din Ibn al-Khatib and Ibn Abi Usayba'a, who highlighted his proficiency in anatomy and surgical procedures (Ibn Abi Usaybi'a, ʿUyūn al-Anbāʾ fī Ṭabaqāt al-Aṭibbāʾ, Cairo edition, 1965). Ibn Tufail's extensive medical knowledge is evident in his two-volume treatise, which includes an essay composed of 7777 verses of clear Rajaz, as defined by classical Arab scholars; this holds a dual significance: it is both an ancient poetic genre and one of the sixteen recognised metrical patterns (buḥūr) in Arabic prosody. As a poetic form, Rajaz is notable for its simplicity, brevity, and oral appeal - often improvised by Bedouins in contexts like war chants and camel-driving songs. Structurally, it is unique for consisting of single-line verses, which distinguishes it from the two-line format of most other Arabic poetic forms. As a metrical pattern, it is the seventh in the classical system of Arabic meters, valued for its rhythmic clarity and suitability for educational and didactic content. These characteristics made Rajaz an ideal vehicle for scientific and medical expression, facilitating memorisation and transmission of complex information. This work, preserved in the Al-Qarawiyyin library in Fez under the number 1969, meticulously outlines the diagnosis, causes, and treatment of various diseases, focusing on ailments from the head to the knees.

Figure 2. View of the library of Al Quaraouiyine University in Fez.

The treatise is organised into seven chapters, each addressing different aspects of health and disease. Notably, the fourth chapter is dedicated to diseases of the digestive system.

Method:

This study is grounded in a detailed examination of the fourth section of Ibn Tufail's medical poem, *Al ʿUrjuzah Fi Al Tibb (Ibn Tufail, Al-ʿUrjūzah fī al-Ṭibb, MS Al-Qarawiyyin Library, Fez, no. 1969)*, which offers a comprehensive overview of diseases affecting the digestive system. In this segment, Ibn Tufail meticulously categorises and discusses various hepatic and gastrointestinal conditions across 28 distinct chapters, addressing pathologies such as hepatic insufficiency, hepatic tumours, calcification, ascites, jaundice, and a variety of splenic disorders.

A significant focus of this section is the exploration of colic, a form of intense abdominal pain, alongside its therapeutic management. Ibn Tufail also addresses the condition known as Ayloush, which aligns with the modern understanding of acute intestinal obstruction. His work provides an in-depth account of the aetiology, clinical manifestations, and treatment strategies for these conditions, reflecting a sophisticated grasp of gastrointestinal pathology.

We concentrated specifically on the chapters that pertain to colic and acute intestinal obstruction. Through a thorough analysis of Ibn Tufail's descriptions and treatment protocols, we aimed to draw meaningful parallels between his historical medical practices and contemporary clinical approaches. The therapeutic interventions proposed by Ibn Tufail - including herbal formulations, dietary modifications, and targeted therapeutic procedures -were critically evaluated for their relevance and potential applicability in modern medicine. By contextualising these methodologies within the broader framework of contemporary healthcare, we aspire to illuminate the enduring legacy of Islamic medicine in addressing abdominal conditions.

Results

1. Abdominal pain and its treatment according to Ibn Tufail

Abdominal pain, a common medical complaint, manifests as discomfort or distress in the abdominal region, spanning from the lower chest to the pelvic area. Its aetiology varies widely, with gastroenteritis and inflammatory conditions of the digestive system ranking among the most prevalent causes. However, certain instances of abdominal pain necessitate urgent medical attention, such as in cases of acute appendicitis, ruptured aortic aneurysm, or ectopic pregnancy.

Diagnosing the underlying cause of abdominal pain poses a considerable challenge due to the overlapping symptoms and manifestations across different pathologies. Despite this complexity, Ibn Tufail offered insightful observations regarding abdominal pain, characterising it as severe in nature and primarily involving the intestines. He noted potential accompanying symptoms such as diarrhoea or thirst, implicating disturbances in bile function as a contributing factor.

Ibn Tufail's approach to the treatment of abdominal pain centred on addressing the underlying disorder within the digestive system. By identifying bile dysfunction as a key element in the pathogenesis of abdominal pain, he sought to restore balance and alleviate symptoms through targeted therapeutic interventions.

Ibn Tufail then talked about the treatment of abdominal colic, describing herbs and medicines with different specific amounts depending on the presence or absence of other symptoms such as diarrhoea or thirst, and he detailed them precisely in these verses:

English Translation	Arabic Verse from Al 'Urjuzah Fi Al Tibb
I prescribed **two dirhams** for ingestion, Of psyllium, post two thorough cleanses.	نيتلسغ دعب انوطق رزب **نيمهرد** برشي نأ ترمأ
A dirham's weight of purslane seeds advised.	ةلجرلا رزب نزولاب **امهردو**
With **a dirham** of roses, healing supplied.	ةلعلا اذ رب وهف درو **مهردو**
Let cool, pure water quench the fire, For it provides relief, as health grows higher.	دراو اعفن ديفي هنإف ادراب احارق ءاملا نكيلو
A spoonful of Aniseed, gently warm.	فرح بح ةقلعم هقساف
In water, ease provided, a gentle charm.	فطلب عفان ءام نخسب لاهسإ الب صغم نكي نإو
Two dirhams per letter, the dosage precise.	اين افرح **نيمهرد رادقم** لاحلا نم اضيأ هتيقس
Ensuring potency, yet without overprize.	ايوق نوكي ال ضر دعب نم

2. Acute Intestinal obstruction

Acute intestinal obstruction presents a significant medical challenge characterised by the mechanical or functional blockage of the intestine, impeding the normal flow and movement of intestinal contents. Recognised as a medico-surgical emergency, acute intestinal obstruction demands prompt intervention to prevent serious complications. In his medical writings, Ibn Tufail provided valuable insights into the concept of Ilawush, which corresponds to ileus in modern medical terminology. He defined it as an obstruction of the small intestine caused by various factors such as tumours, accumulated phlegm, hardened stool or excrement, blood from the stomach, or an abnormal mixture of bile, either cold or hot in nature.

Moreover, Ibn Tufail elucidated treatment strategies tailored to each subtype of ileus, emphasising the importance of targeted interventions to alleviate obstruction and restore normal intestinal function. The treatment modalities prescribed by Ibn Tufail likely encompassed a combination of medical and surgical interventions aimed at relieving the underlying obstruction and mitigating associated symptoms.

English Translation	Arabic Verse from Al 'Urjuzah Fi Al Tibb
Administer to him everything, along with a **mithqal of** Iraj, as drinking it, akin to kohl, brings soothing sway.	لاثملا يف لحكلاك ايارج **لاقثم** عم عيمجلا هقساو
Prepare an **enema** of barley, its skin meticulously peeled.	روشقم هرشق نم ضضرم ريعش نم **ةنقحلا** هل عنصاو
Cooked within fat, its essence revealed.	نهدلاب اهلك خبطت
Mix it seamlessly with grease, in the **enema's** blend.	نقحلا دنع موحشلاب هطلخاو
Administering diligently, to ensure the ailment's end.	للم نود **ةنقحلا** دواعو
Repeat the enema without faltering, with patience in accord, letting each dose be **half a pound**, ensuring its benefit.	**لطر فصن** ةنقحلا نكتلو

3. In Ibn Tufail's approach to the treatment of abdominal colic and acute intestinal obstruction

He advocated for a multifaceted therapeutic regimen comprising medications, dietary interventions, and specific beverages. Through his meticulous prescriptions, Ibn Tufail aimed to address the underlying pathology while providing symptomatic relief. The following are the key components of his treatment protocol:

Table 2. Herbs and medicines described in Ibn Tufail's URJUZA (poem) and their scientific names.

Name of the medicine/plant	Definition	scientific name
الانخونة **Ajwain** (Bairwa, Ranjan et al. "Trachyspermum ammi." Pharmacognosy reviews vol. 6,11 (2012), p. 56).	Ajwain is a plant also known as **ajowan caraway**, and royal cumin. It is an annual herb in the family Apiaceae that does not exceed 50 cm in height. Both the leaves and the seed-like fruit of the plant are consumed by humans.	Trachyspermum ammi
القنطريون **holy thistle** (Vasile B. "Centaurea benedicta L.: A Review of Its Ethnopharmacological and Phytochemical Properties," Journal of Medicinal Plants Research 4.23 [2010], pp. 2351–2357).	Cornflower is an herbaceous plant from the gentian family. It grows wild from 10 to 30 cm tall. Its shape is rectangular or lanceolate. The lobes are rectangular and triangular, and their edges are serrated and thorny.	Centaurea Benedicta
الزرقطونة **black psyllium** (Giacosa, Attilio, and Mariangela Rondanelli. 44 Suppl 1 (2010): S58-60).	Plantago ovum is a soluble fibre derived from the seed husks of the plantain plant.	Plantago psyllium
الرذ الرجلة **little hogweed** (Fawzy Z.F., "Purslane (Portulaca oleracea): An Overview of its Nutritional and Medicinal Properties," Journal of Nutritional Science 6 [2017], e34).	Pursley seeds are the seeds of the vegetable Purslane, also known as watercress.	Portulaca oleracea
الكمون **Cumin** (Sharma, R., et al. "Cuminum cyminum: Antioxidant and Anti-inflammatory Properties," International Journal of Plant Sciences 182.5 [2021], pp. 555–560).	Cumin is an annual herbaceous plant with limited growth, reaching a height of 30-40 cm. Its leaves are compound, thin, dark green in colour, and the plant bears small white flowers.	Cuminum cyminum
Golden shower (Khan M.A., et al. "Medicinal Uses of Cassia fistula: A Phytopharmacological Review," Phytomedicine [2017])	Shanbar is a semi-leafed plant from the leguminous family.	Cassia fistula
الكاكنج **Alkekengi** (Zhou Y., et al. "Ethnopharmacological Uses of Physalis alkekengi," *Journal of Natural Products* 85.7 (2022): 1120–1128)	The kakang is a wild herbaceous plant from the Solanaceae family. It reaches a height of 20-60 cm with alternating petiolate leaves. Its flowers are small, axillary-shaped, white, and its nuclear fruits are purple.	Physalis Alkekengi L
الحبة الحلوة **Aniseed** (Ahmad M., et al. "An Updated Review on the Pharmacological Properties of *Pimpinella anisum*." *Journal of Herbal Pharmacotherapy* 20.2 (2020): 145–152)	Aniseed: Sweet bean, or fennel, is a herbaceous plant that contains a lot of volatile oils.	Pimpinella Anisum
الصندل ***Santalum*** (Al-Asmari A.K., Athar M.T., Kadasah S.G. "Antioxidant and stress modulatory efficacy of essential oil extracted from Santalum album L.," Industrial Crops and Products 133 [2019], pp. 244–252).	The sandalwood is a parasitic plant, its height ranges between 8-10 m. It parasites on nearby trees and attaches to them.	Santalum
الحلبة **Fenugreek** (Ulbricht C., Basch E., et al., "Fenugreek (Trigonella foenum-graecum L.): An Evidence-Based Systematic Review," Journal of Herbal Pharmacotherapy 7.3–4 [2007], pp. 143–177).	Fenugreek is an annual plant of the genus Fenugreek, belonging to the leguminous family.	Trigonella foenum-graecum
الكرفس **Celery** (Al-Asmari A.K., Athar M.T., Kadasah S.G., "An Updated Phytopharmacological Review on Medicinal Plant of Arab Region: Apium graveolens Linn.," Pharmacognosy Reviews 11.21 [2017], pp. 13–18).	Celery is a type of plant in the celery genus of the Apiaceae family. Celery is a vegetable whose stalk and leaves are eaten raw or cooked.	Apium graveolens

Discussion:

Treating abdominal pain (colic) and acute intestinal obstruction was a primary concern for ancient and Islamic physicians, and they provided several remedies based on herbs and natural preparations, also posology (the study of dosing) was a critical aspect of treatment. Physicians like Ibn Tufail, Ibn Sina, Al-Razi, and others paid close attention to the proper dosage of medicinal herbs, ensuring both safety and efficacy. However, the units of measurement and methods of prescribing doses were quite different from what we use today.

Common Units of Measurement in Islamic Medicine:

1. Mithqal (لاقثم):

- The mithqal was a common unit for measuring weight in medieval Islamic medicine, roughly equivalent to 4.25 grams. Physicians often prescribed doses in mithqal for potent medicines or complex herbal mixtures.

2. Dirham (مهرد):

- Another widely used unit, the dirham, was approximately 3 grams. It was often used for less potent substances or when combining various ingredients in a formula. Several dirhams could be prescribed in mixtures.

3. Qirat (طاريق):

- The qirat, equivalent to about 0.2 grams, was a smaller unit used for particularly potent or concentrated drugs, where precise measurement was critical to avoid side effects or toxicity.

4. Ratls and Oukiyyas:

- These were larger units. The **ratl** (equivalent to approximately 406 grams) and the **oukiyya** (approximately 30 grams) were used for measuring liquids or bulkier items. Ratls were used when preparing large amounts of liquid medicines, such as syrups or decoctions.

Posology in Islamic medicine was not rigid but was often adjusted based on several factors:

- **Age**: Children were prescribed lower doses than adults, typically halving the amount.
- **Constitution**: Stronger constitutions were given higher doses, while weaker individuals received smaller amounts.
- **Season**: In colder weather, higher doses of "warming" herbs like ginger or cinnamon might be given, while cooling herbs were prescribed in the summer.
- **Patient's response**: Dosages could be adjusted based on how the patient responded to the initial dose.

1. Treatment of abdominal pain or colic:

1. Ibn Sina (Avicenna: 980 – 1037 CE) – The Canon of Medicine (Ibn Sina, Al-Qānūn fī al-Ṭibb [The Canon of Medicine], trans. O. Cameron Gruner, AMS Press, 1970):

For abdominal pain or colic, Ibn Sina often prescribed carminative (gas-relieving) herbs and warming substances to relax the intestines and relieve pain. He carefully tailored the dosages to avoid overstimulation of the digestive system.

- **Dosage for Colic**:
  - Ibn Sina recommended **fennel** or **anise** for digestive relief. The typical dose was around **1-2 dirhams** (3-6 grams) of ground seeds, often taken as a tea or decoction.
  - For stronger substances, such as **myrrh** (known for its antispasmodic effects), he might recommend **1 mithqal** (approximately 4.25 grams), diluted in water or another liquid.
- **Administration**:
  - The herbs would usually be prepared as an infusion or decoction (boiled in water), and the patient would drink this multiple times throughout the day.
  - In more severe cases, Ibn Sina suggested combining these herbs with a mild **purgative** (laxative) to clear the intestines, particularly in cases of colic caused by constipation or obstruction.

2. Al-Razi (Rhazes: 865 – 925 CE) – Al-Hawi (Al-Razi, Al-Ḥāwī [The Comprehensive Book on Medicine], trans. H.M. Said, Karachi: Hamdard National Foundation, 1969):

Al-Razi, in his comprehensive work, recommended remedies that would soothe spasms in the intestines. He often used a combination of **fennel**, **cumin**, and **coriander** to relieve colic.

- **Dosage for Colic**:
  - **Cumin seeds**: A typical dose would be **2-3 dirhams** (6-9 grams) ground into a fine powder and taken with warm water or milk.
  - **Coriander seeds**: Often recommended at a dose of **1 dirham** (3 grams) to reduce bloating and ease abdominal cramping.

- **Administration**:
  - Like Ibn Sina, Al-Razi preferred decoctions or powders mixed in water. These would be drunk **two to three times a day** until symptoms subsided.
  - For more severe pain, he might prescribe stronger substances like **pepper** or **ginger**, with careful attention to dosage, using **qirats** (0.2 grams) for these more potent spices.

3. Ibn Al-Baitar (1197 – 1248 CE) – The Comprehensive Book on Simple Drugs and Foodstuffs (Ibn Al-Baitar, The Comprehensive Book on Simple Drugs and Foodstuffs, trans. A.E.J.H. and T.N.R., American University in Cairo Press, 2001):

Ibn Al-Baitar was known for his extensive work on herbal remedies, and he offered detailed descriptions of dosages for various herbs used to treat colic.

- **Dosage for Colic**:
  - **Fenugreek** was a popular remedy, and he often prescribed **2 dirhams** (6 grams) of fenugreek powder, mixed with oil or honey, to relieve abdominal discomfort and cramps.
  - For treating more severe intestinal spasms, he recommended **peppermint** at a dose of **1 mithqal** (4.25 grams) in a decoction or powder.
- **Administration**:
  - Fenugreek was commonly boiled in water and drunk as a **tea**. Peppermint, being cooling and soothing, was often combined with a bit of honey and taken **twice daily**.
  - In more complex prescriptions, Ibn Al-Baitar might mix multiple herbs and adjust the doses based on the patient's constitution, using **qirat** (0.2 grams) measures for potent herbs like **cinnamon** or **cardamom**.

4. Ibn Rushd (Averroes: 1126 – 1198 CE) – Kulliyat fi al-Tibb (ابن رشد الكليات في الطب) (Ibn Rushd, Kulliyāt fī al-Ṭibb, trans. S. A. Al-Yaqubi, Dar al-Kutub al-Ilmiyah, 1995):

- In *Kulliyat fi al-Tibb*, Ibn Rushd discusses general principles of medicine, including dosage and units of measurement. He also refers to **dirhams** and **mithqals** for prescribing various treatments.
- **Example**: For intestinal pain or colic, Ibn Rushd recommended **ginger** in **qirat** units (0.2 grams) for potent remedies and **dirhams** for milder treatments. His work often emphasises adjusting doses based on the individual patient's needs and constitution.

5. Dawud al-Antaki (Died in 1599 CE (Date of birth uncertain, often estimated mid-16th century)– Tadhkirat Uli Al-Albab (تذكرة أولي الألباب) (Dawud al-Antaki, Tadhkirat Uli al-Albāb [The Memoir of the Men of Understanding], trans. M. Al-Khalidi, Dar al-Kutub al-Ilmiyah, 2009):

In this text, Dawud al-Antaki describes many treatments for gastrointestinal disorders, including colic, with reference to the use of **mithqal** and **dirham** units for precise dosing.

- **Example**: For abdominal pain, he prescribed **coriander** at **1-2 dirhams** and often combined it with other herbs like fennel to relieve cramping and colic.

6. Al-Zahrawi (Abulcasis: 936 – 1013 CE) – Kitab al-Tasrif (كتاب التصريف لمن عجز عن التأليف) Al-Zahrawi, Kitāb al-Taṣrīf [The Book of Medical Administration], trans. N.K.M. al-Ghazali, Dar al-Kutub al-Ilmiyah, 2005):

In his encyclopaedic work *Kitab al-Tasrif*, Al-Zahrawi includes numerous references to the appropriate dosage of medicinal herbs for various ailments, including abdominal pain and digestive issues.

- **Example**: He often used **mithqal** for stronger remedies and **dirhams** for general herbal prescriptions like fennel or cumin to treat colic and gastrointestinal disorders.

Below is a comprehensive table that compares the posology (dosage) and units of measurement used by prominent Islamic physicians for treating abdominal pain or colic. The table summarises the herbal remedies, dosages, and units of measurement as prescribed by these physicians, reflecting the detailed discussion above.

1. Dosage Precision:
   - **Similar Units**: All physicians used traditional weight units such as **dirhams** and **mithqals**, but Ibn Tufail demonstrated exceptional precision in dosage with clear instructions, similar to his peers. His specific use of 2 dirhams for various remedies mirrors the cautious approach seen in other physicians, aiming for balance between effectiveness and safety.
   - **Tailored Doses**: Ibn Tufail stands out for tailoring the dosage based on the presence or absence of symptoms such as diarrhoea or thirst. This reflects a more individualised treatment strategy, showing a nuanced understanding of symptom variation and its role in guiding therapy.

Table 3. Posology of Abdominal Pain Treatments in Classical Islamic Medicine.

Physician	Text	Remedy/Herb for Abdominal Pain	Dosage	Unit of Measurement	Administration
Ibn Sina (Avicenna)	*The Canon of Medicine* (القانون في الطب)	Fennel, Anise	1-2 **dirhams**	**Dirham** (≈ 3 grams)	Decoction/Infusion, taken 2-3 times daily
		Myrrh	1 **mithqal**	**Mithqal** (≈ 4.25 grams)	Diluted in water or liquid, as needed for pain relief
Al-Razi (Rhazes)	*Al-Hawi fi Al-Tibb* (الحاوي في الطب)	Cumin seeds, Fennel	2-3 **dirhams**	**Dirham** (≈ 3 grams)	Ground into powder, mixed with water or milk
		Coriander seeds	1 **dirham**	**Dirham** (≈ 3 grams)	Powder or decoction, taken 2-3 times daily
Ibn Al-Baitar	*Kitab Al-Jami'* (الجامع لمفردات الأدوية والأغذية)	Fenugreek	2 **dirhams**	**Dirham** (≈ 3 grams)	Boiled as tea, combined with oil or honey
		Peppermint	1 **mithqal**	**Mithqal** (≈ 4.25 grams)	Decoction or powder mixed with honey, taken 2 times daily
Ibn Rushd (Averroes)	*Kulliyat fi al-Tibb* (الكليات في الطب)	Ginger	1-2 **qirats**	**Qirat** (≈ 0.2 grams)	Powder or decoction, used cautiously due to potency
			1 **dirham**	**Dirham** (≈ 3 grams)	In milder treatments, combined with other herbs
Dawud al-Antaki	*Tadhkirat Uli Al-Albab* (تذكرة أولي الألباب)	Coriander	1-2 **dirhams**	**Dirham** (≈ 3 grams)	Decoction, taken for digestive discomfort
Al-Zahrawi (Abulcasis)	*Kitab al-Tasrif* (كتاب التصريف لمن عجز عن التأليف)	Fennel, Cumin	1-2 **mithqals**	**Mithqal** (≈ 4.25 grams)	Decoction or powder, mixed in warm water
		Ginger, Cinnamon	0.5-1 **qirat**	**Qirat** (≈ 0.2 grams)	Added to decoctions, due to potency
Ibn Tofail	*Al 'Urjuzah Fi Al Tibb* (أرجوزة في الطب)	Psyllium, Purslane seeds, Rose water	1-2 dirhams	Dirham (≈ 3 grams)	Decoction with water for colic, taken 2 times daily
			1-2 dirhams	Dirham (≈ 3 grams)	Warm infusion, mixed in water, for pain without diarrhoea

2. Acute abdominal obstruction

a- Medical treatment

Below is a comparison focused on the treatment of **acute abdominal obstruction** (known as "ilawech" in traditional medicine) by Islamic physicians, including the remedies, dosages, and units of measurement they used.

Ibn Tufail's approach to treating acute intestinal obstruction differs notably from that of his peers by focusing on a **mechanical solution** using enemas and larger doses, as opposed to the more common use of purgative herbs. His remedies show a practical and aggressive intervention strategy designed to clear obstructions swiftly. This makes his work stand out in the broader scope of Islamic medical traditions, offering a distinctive and methodical way of addressing a serious condition.

1. Use of Purgatives:

- Across the board, **purgatives** were commonly prescribed for treating acute intestinal obstruction, with many physicians recommending herbs such as **senna**, **aloe**, and **castor oil** for their laxative properties. Both Ibn Sina and Al-Zahrawi favoured senna for its mild action, while Ibn Al-Baitar and Ibn Rushd also emphasised the use of castor oil and colocynth in severe cases.
- **Ibn Tufail**, however, diverged slightly by not using these typical purgatives as the first line of treatment. Instead, he proposed **barley Enemas mixed with fat and grease**, a more mechanical

Table 4. Posology for Acute Abdominal Obstruction (Ilawech).

Physician	Text	Remedy/Herb for Acute Abdominal Obstruction (Ilawech)	Dosage	Unit of Measurement	Administration
Ibn Sina (Avicenna)	*The Canon of Medicine* (القانون في الطب)	Senna leaves (mild purgative)	3-5 **dirhams**	**Dirham** (≈ 3 grams)	Boiled into decoction, taken once daily to relieve blockage
		Castor oil (stronger purgative)	1-2 **mithqals**	**Mithqal** (≈ 4.25 grams)	Mixed with water or honey, taken in severe cases
Al-Razi (Rhazes)	*Al-Hawi fi Al-Tibb* (الحاوي في الطب)	Colocynth (bitter apple)	0.5-1 **qirat**	**Qirat** (≈ 0.2 grams)	Strong laxative, powdered and mixed with water
		Aloe (purgative and anti-inflammatory)	2-3 **dirhams**	**Dirham** (≈ 3 grams)	Decoction, taken with honey to ease intestinal obstruction
Ibn Al-Baitar	*Kitab Al-Jami'* (الجامع لمفردات الأدوية والأغذية)	Rhubarb (purgative)	2 **dirhams**	**Dirham** (≈ 3 grams)	Decoction, taken once daily to ease bowel movements
		Olive oil (emollient and mild purgative)	1 **mithqal**	**Mithqal** (≈ 4.25 grams)	Taken on an empty stomach to lubricate and soften blockage
Ibn Rushd (Averroes)	*Kulliyat fi al-Tibb* (الكليات في الطب)	Castor oil	1-2 **mithqals**	**Mithqal** (≈ 4.25 grams)	Taken orally with honey or water for severe obstruction
		Colocynth	0.5 **qirat**	**Qirat** (≈ 0.2 grams)	Mixed into water or honey, used in extreme cases only
Dawud al-Antaki	*Tadhkirat Uli Al-Albab* (تذكرة أولي الألباب)	Olive oil	1-2 **mithqals**	**Mithqal** (≈ 4.25 grams)	Taken orally, especially in early morning for best effect
Al-Zahrawi (Abulcasis)	*Kitab al-Tasrif* (الكتاب التصريف لمن عجز عن التأليف)	Aloe	2 **dirhams**	**Dirham** (≈ 3 grams)	Mixed with honey, taken once daily as a purgative
		Senna	3-5 **dirhams**	**Dirham** (≈ 3 grams)	Decoction or powder mixed with water, as a mild purgative
Ibn Tufail	*Al-'Urjuzah Fi Al-Tibb* (الأرجوزة في الطب)	Barley Enema mixed with fat and grease	0.5 ratal	**Ratal** (≈ 382.5 grams)	Repeatedly injected into the bowel to alleviate obstruction
		Iraj (electuary)	1 mithqal	**Mithqal** (≈ 4.25 grams)	Taken orally, combined with liquid for soothing relief

and hydrating approach to lubricate and soften blockages, which stands out from the herbal-based treatments of his peers.

2. Focus on Symptom Management:

- Many classical Islamic physicians, including **Al-Razi**, **Ibn Al-Baitar**, and **Ibn Sina**, suggested treatments that addressed not only the obstruction but also the inflammation and pain associated with it, such as using **aloe** for its anti-inflammatory properties.
- **Ibn Tufail**, while aware of symptomatic relief, appeared to focus more on directly addressing the obstruction itself, particularly with the use of **enemas** and **electuaries** (like **iraj**). His regimen shows a clear intent to clear the blockage through forceful expulsion methods rather than primarily soothing the patient.

3. Unit of Measurement and Precision:

- Most of the physicians used **dirhams** and **mithqals** for their measurements, standard in Islamic medicine, reflecting a consistent approach to ensuring proper dosage.
- **Ibn Tufail** introduced a much larger quantity in his recommendation for the **barley and fat enemas**, suggesting **0.5 ratal** (around 382.5 grams). This is a much more substantial intervention compared

to the smaller dosages of purgatives like aloe or castor oil used by others. His use of **large volumes** shows his emphasis on achieving swift, mechanical relief of the obstruction.

4. Non-Pharmacological Methods:

– Ibn Tufail's **enema therapy** presents a method that could be classified as non-pharmacological compared to the oral and decoction-based treatments of his contemporaries. This focus on physical intervention contrasts with the reliance on **herbal decoctions** seen in the work of Ibn Sina, Al-Razi, and others, who opted for gentler, internally administered treatments.

Table 5. Comparison of Treatments for Acute Abdominal Obstruction and Abdominal Pain: Classical Islamic Physicians vs. Modern Medical Recommendations.

Aspect	Classical Islamic Physicians (10th-14th Century)	**Modern Medical Recommendations** (2024) (American College of Surgeons. Surgical Management of Bowel Obstruction. ACS Clinical Guidelines Series, 2024.).
Condition: Abdominal Pain	**Herbal/Medical Treatments**	**Medical Treatments**
	- Fennel, anise, cumin, and coriander: Used to relieve colic and mild abdominal pain.	- Antispasmodics (e.g., hyoscine, dicyclomine) for muscle spasms and cramping.
	- Ginger and peppermint: Known for their carminative and anti-inflammatory effects.	- NSAIDs (e.g., ibuprofen, aspirin) or acetaminophen for pain relief.
	- Honey and olive oil: Prescribed as emollients to soothe digestive irritation.	- Proton-pump inhibitors (e.g., omeprazole) for pain caused by gastritis or ulcers.
	- Warm infusions and decoctions: Administered to ease pain and aid digestion.	- Dietary adjustments and hydration therapy for gastrointestinal pain.
	- Massage and abdominal manipulation: Proposed by Al-Tamimi to relieve cramping.	- Antibiotics if pain is due to an infection, such as gastroenteritis.
Condition: Acute Abdominal Obstruction (Ilawech)	**Herbal/Medical Treatments**	**Medical Treatments**
	- Senna leaves, rhubarb, and aloe: Used as purgatives to relieve blockages.	- Laxatives (e.g., polyethylene glycol, lactulose) to soften stools and ease passage.
	- Castor oil and olive oil: Taken orally to lubricate and facilitate bowel movements.	- Enemas to clear lower bowel blockages.
	- Colocynth (bitter apple): Used in small doses as a strong laxative but dangerous in high doses.	- Osmotic laxatives and stimulant laxatives in more severe cases.
	- Manual abdominal manipulation and massage: Proposed by Al-Tamimi to ease obstruction.	- Intravenous fluids and nasogastric decompression for more severe cases of obstruction.
Surgical Treatment for Acute Abdominal Obstruction	**Surgical Treatments (Classical)**	**Surgical Treatments (2024)**
	- Al-Zahrawi advocated surgery in severe cases of intestinal obstruction.	- Laparoscopy or open abdominal surgery to relieve bowel obstruction.
	- Surgical tools and techniques included incisions and manual removal of obstructions.	- Minimally invasive surgery is preferred for less recovery time and fewer complications.
	- Post-surgical care was emphasised, with dietary changes and close monitoring.	- Post-operative management includes antibiotics, hydration, and bowel rest.

The table highlights both the similarities and advancements in treating abdominal pain and acute intestinal obstruction across centuries. Classical Islamic physicians, such as Al-Zahrawi, Ibn Sina, and Ibn Tofail, relied on a combination of herbal remedies, purgatives, and non-invasive methods like massage to manage these conditions. Their approach was largely based on natural treatments and manual interventions,

with surgery reserved only for the most severe cases, particularly by Al-Zahrawi, who pioneered surgical techniques for intestinal blockages.

In modern medicine, while certain herbal treatments (e.g., fennel, ginger) continue to be recognised for their digestive benefits, synthetic drugs like antispasmodics, NSAIDs, and laxatives are more commonly used. For severe cases, minimally invasive surgeries, such as laparoscopy, represent a significant advancement, offering faster recovery and fewer complications than the classical surgical methods.

Overall, the comparison shows the evolution from traditional herbal and manual techniques to more precise pharmaceutical treatments and advanced surgical interventions, reflecting the continuous improvement in medical practices.

Conclusion

The examination of Ibn Tufail's medical poem *Al 'Urjuzah Fi Al Tibb* reveals a profound understanding of gastrointestinal disorders and posology within medieval Islamic medicine. Ibn Tufail's innovative approach to abdominal pain and acute intestinal obstruction not only demonstrates continuity with earlier traditions but also introduces distinctive methodologies, particularly his emphasis on bile dysfunction and the individual patient's constitution in treatment strategies.

These classical physicians displayed a sophisticated grasp of posology, carefully analysing dosages and the administration of herbal remedies to optimise therapeutic efficacy while minimising risks. Their reliance on herbal treatments, purgatives, and non-invasive techniques reflects a holistic approach that integrates pharmacological knowledge with a deep understanding of natural remedies and the body's response to interventions, positioning surgery as a last resort.

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ΠΕΡΙΛΗΨΗ

Φυτοθεραπευτική γνώση και πρακτικές λύσεις: συγκριτική ανάλυση των θεραπευτικών προσεγγίσεων για το κοιλιακό άλγος και την οξεία εντερική απόφραξη στο έμμετρο έργο του Ibn Tufail «Al 'Urjuzah Fi Al Tibb» και σε άλλα κλασικά ισλαμικά ιατρικά συγγράμματα, με έμφαση στη δοσολογία

Mouhssine Adnane, El Bachir Benjelloun

Καθ' όλη τη διάρκεια της ισλαμικής ιατρικής ιστορίας, η ποίηση αποτέλεσε βασικό μέσο μετάδοσης περίπλοκων ιατρικών γνώσεων με τρόπο προσιτό. Το έργο του Ibn Tufail *Al 'Urjuzah Fi Al Tibb* αποτελεί χαρακτηριστικό παράδειγμα αυτής της παράδοσης, προσφέροντας διδακτικούς στίχους πλούσιους σε θεραπευτικές γνώσεις, ιδιαίτερα σε ό,τι αφορά τον κοιλιακό πόνο και την οξεία εντερική απόφραξη. Η παρούσα μελέτη εμβαθύνει στις δοσολογικές αρχές που περιγράφονται στο ποίημα του Ibn Tufail, αναλύοντας τον τρόπο με τον οποίο προσάρμοζε τις δόσεις ανάλογα με τις ιδιαίτερες ανάγκες διαφορετικών δημογραφικών ομάδων ασθενών, όπως οι ηλικιωμένοι, τα παιδιά και οι έγκυες γυναίκες. Η ανάλυση αναδεικνύει την επιμελή χρήση μετρήσεων βάρους και όγκου στις συνταγές του, αντανακλώντας την επιστημονική ακρίβεια που χαρακτήριζε την ισλαμική ιατρική πρακτική. Το άρθρο εντάσσει τη

συμβολή του Ibn Tufail στο ευρύτερο πλαίσιο της μεσαιωνικής ισλαμικής ιατρικής, υπογραμμίζοντας τη διαχρονική αξία των στρατηγικών δοσολογίας του στη σύγχρονη ιατρική φροντίδα. Επιπλέον, αναδεικνύει τη διαρκή σχέση ποίησης και ιατρικής, επιβεβαιώνοντας τη σημασία των ποιητικών ιατρικών κειμένων τόσο ως κλινικών πηγών όσο και ως παιδαγωγικών εργαλείων για τη διατήρηση και διάδοση της ιατρικής γνώσης από γενιά σε γενιά.

Λέξεις Κλειδιά: *Δοσολογία, Ibn Tufail, Al 'Urjuzah Fi Al Tibb Ισλαμική ιατρική ιστορία*

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Geoscience or spatial dynamics of knowledge: The intellectual trajectory from Physiognomy to Phrenology

Davide Viggiano[1]

Figure 3. The painted decoration of the ceremonial hall of the Academy of Athens is the work of the Austrian painter Christian Griepenkerl (1839-1916), a student of the great painter Karl Rahl (1812-1865) who was Professor of the Academy of Fine Arts in Vienna. The iconographic ensemble that took place in the two years 1878-1880 has as its theme Prometheus Bound of Aeschylus and is related to the idea that prevailed in the 19th century about the Academies as carriers of wisdom and light.

Abstract

This study examines the idea that the spatial dynamics of knowledge production are critical for fostering innovative breakthroughs. To illustrate this idea, we trace the intellectual transition from physiognomy to phrenology, charting its origins from Naples to Germany. In Naples, a hub of academic innovation under various regimes, Giovanbattista della Porta's 16th-century work on physiognomy, *De Humana physiognomonia* set the stage for future explorations in the body-personality relation, notably invoking Saturn to characterise melancholic traits.

In England, Sir Thomas Browne's *Religio Medici* and in Germany, Johann Kaspar Lavater's *Essays on Physiognomy* drew from Della Porta's work. Lavater's emphasis on the relationship between facial features and personality paved the way for the phrenological theories of Joseph Gall and Johan Spurzheim, who shifted focus to cranial morphology as indicative of personality traits and identified the 'organ' of melancholia beneath the parietal bones. This shift engendered a renewed interest in mind-body relations back in Naples, notably through figures such as Miraglia, though reception was mixed and ultimately resistant. While influential for a time, phrenology's influence waned as attention turned, under figures like Bianchi, towards the brain's internal structures rather than its external contours. This dynamic of the knowledge production flying away form its birthplace and then returning back to it is beautifully captured by the epigram inscribed above the door of the Aula at the Athens Academy: "*The Muses, living in Freedom, wandering for long time abroad, returning back to the much desired Greece, they dispense again to the Greek youths gifts close to their hearts*", which evokes the return of ideas to their native soil after circulating through diverse intellectual landscapes.

Key Words: *Intellectual trajectory, Physiognomy, Phrenology*

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Introduction

The history of medicine offers valuable insights into the mechanisms underpinning discovery and the conditions required within a community to foster revolutionary ideas or breakthroughs. Traditionally, timelines of scientific discovery have emphasised factors such as scholarly networking -collaboration, communication, and interdisciplinarity - as well as technological advancements that facilitate new modes of exploration. Other frequently cited elements include funding capacity, the nation's economic power, and prevailing cultural conditions that may enable or constrain certain developments.[1]

Little attention is usually paid to the geographical dimension of intellectual thought, as though all scholars live within a single, economically privileged locus that naturally attracts talent. Yet, what if scientific thought requires geographical mobility? One might hypothesise that scholars, when confined to a particular locale, become entrenched in limited methodologies or themes. Consequently, a site once distinguished by a major discovery may ossify into an unchallenged 'cathedral', thereby stifling further innovation. If this hypothesis is correct, then the movement of ideas and scholars across regions - rather than their stagnation in a dominant hub - becomes critical for intellectual breakthroughs.

This phenomenon reveals a fascinating paradox: when an idea returns to its geographical origin after evolving elsewhere, it often arrives as something fundamentally transformed, sometimes unrecognisable from its initial conception (Figure 1). The original cultural context that sparked the idea may no longer be receptive to its evolved form, having itself transformed in the meantime. This suggests that scientific development is not merely a function of time, but rather a complex interplay between temporal progression and geographical translation.

Consider how quantum mechanics, with roots in German-speaking academia, saw crucial developments in Copenhagen, the United States, and Japan, each location contributing distinct philosophical and practical approaches to its evolution.[2]

This geographic dimension of scientific development suggests that the ecology of ideas requires diverse environments for optimal growth, much like biological evolution benefits from varied ecological niches. The implication for contemporary scientific practice is significant: rather than viewing the geographical dispersion of research as a logistical challenge, we might better understand it as a necessary condition for the full development of scientific concepts.

In this study, we illustrate this theory by analysing the transition from physiognomy to phrenology, which

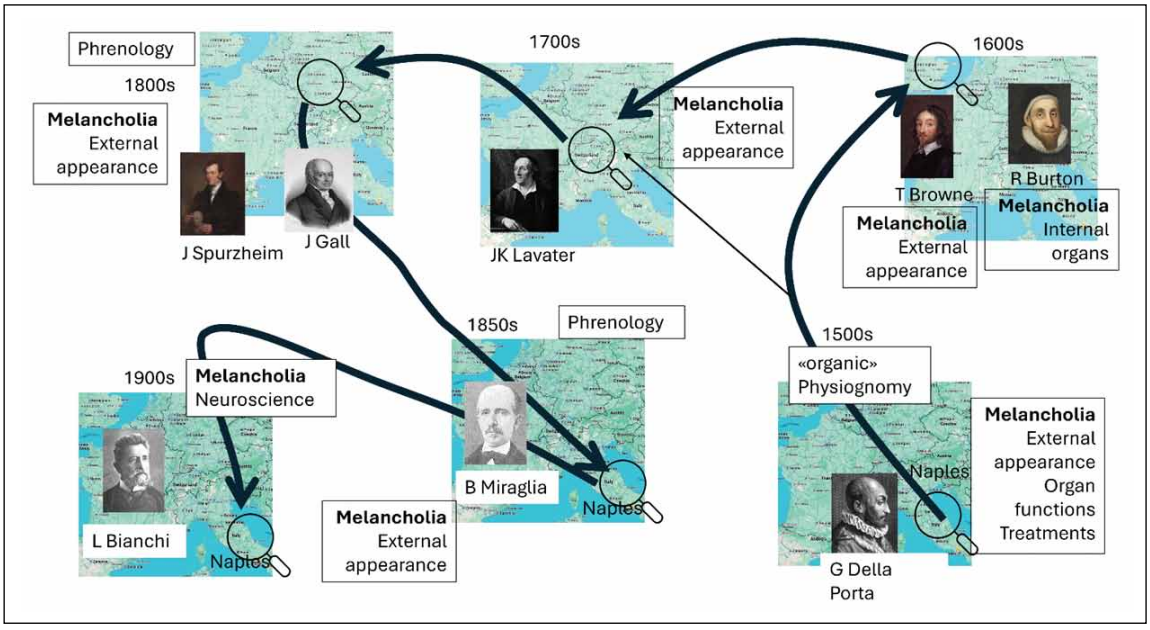

Figure 1. The intellectual trajectory from Physiognomy to Phrenology. The image exemplifies how scientific ideas need to mature far from their birthplace, following geographic and temporal trajectories. When these concepts return to their origin, they are typically transformed and may no longer resonate with the original context, suggesting that scientific development requires both spatial distance and time to reach full maturation.

represents a significant shift in the study of human character and mental faculties.

We examine the intellectual trajectory from physiognomy to phrenology, tracing its path from Naples to Germany. The transition - from physiognomy, which assesses personality based on facial features, to phrenology, which interprets mental faculties through the shape of the skull - constitutes a major shift in both scientific and pseudoscientific thinking. This evolution reflects broader changes in European intellectual thought during the 18th and 19th centuries, especially in the fields of medicine, philosophy, and anthropology.

Our case study

In the late 16th century, Neapolitan scholar Giovan Battista della Porta (1535 – 1615) revitalised the ancient practice of physiognomy - the art of discerning character from facial features. His seminal work, *De humana physiognomonia* (1586), sought to establish a systematic correlation between human appearance and inner qualities, laying a foundation for future explorations into the relationship between physical form and psychological traits.[3]

Della Porta's physiognomy, initially rooted in the classical tradition, was disseminated widely and influenced subsequent writings, such as the *Religio medici* by Sir Thomas Browne (England, 1605-1682).[4] Della Porta is also cited by Robert Burton (England, 1577-1640) in the *Melancholiae anatomen* (1621).[5]

One century later, Della Porta's work inspired the *Essays on physiognomy* by Johann Kaspar Lavater (Switzerland, 1741-1801),[6] a highly influential book translated into English and French. Lavater's work in found fertile ground in Germany, inspiring the localisation theories of Joseph Gall (Germany, 1758–1828), and transforming physiognomy into phrenology by the early 19th century.

Indeed, building upon the interest in linking physical attributes to mental faculties, German physician Franz Joseph Gall (1758–1828) developed the disciple of craniology in the late 18th and early 19th centuries. Gall proposed that each region of the brain corresponded to specific aspects of personality and behaviour, asserting that the contours of the skull could reveal these traits. This marked a shift from facial to cranial analysis.[7]

Gall's collaborators, particularly Johann Gaspar Spurzheim (1776–1832) and Giovanni Antonio Lorenzo Fossati (1786-1874), played a crucial role in popularising phrenology.[8] Fossati was an Italian physician from Milan who moved in Paris at the age of 34 and worked there with Gall.

While Spurzheim diffused phrenology across Europe and the United States, Fossati attempted to disseminate it in Italy.

In northern Italy, Gall's theories found fertile ground in the work of criminologist Cesare Lombroso (1835-1909), who came to know them either during his studies in Paris or through the works of Surzheim. Lombroso built upon phrenological traditions by proposing that criminal predisposition could be discerned from inherited physical and cranial anomalies. In his *Biological Theory of Criminology* (1876), Lombroso asserted that "born criminals" exhibited atavistic traits, such as pronounced cranial prognathism, asymmetrical skulls, or distinct facial features, which echoed Lavater's emphasis on the face and Gall's organology but applied them to the new domain of criminal anthropology. By mapping moral and behavioural propensities onto specific morphological markers, he extended the body-mind relational framework of physiognomy to phrenology, while illustrating how cultural and geographic contexts shape scientific innovation.

He was preceded by C. Morelli e Gatteschi in 1806 in Tuscany, and by J. Mayer in Naples in 1808,[9] the latter making some references to Della Porta's work. Furthermore, a translation concerning phrenology by Friedlander appeared in the *Giornale Enciclopedico di Napoli* in 1807.

However, these ideas were already becoming outdated, encountering resistance in Bologna from A. Moreschi in 1807 (*Sul sistema cranioscopico*), and from Vincenzo Mantovani (1773–1832) in Milan in 1808 and Naples in 1809.[10]

In 1825, Fossati found a receptive intellectual environment in Naples. During his visit to the Incurabili Hospital, he met Luigi Chiaverini (1777–1834), who held the Chair of Materia Medica and General and Therapeutic Nosology. Chiaverini, a former pupil of Lamarck, had previously met Gall in 1815 and had written a commentary on Spurzheim's *Observations su la follia*[11]. During the same visit, Fossati also met Biagio Miraglia, with whom he maintained correspondence. Miraglia would later become director of the Aversa mental asylum. Fossati also made contact in Naples with Giuseppe Saverio Poli (1746–1825), a physicist and zoologist.

In 1844, the English phrenologist George Combe came to Naples, where he met Luigi Ferrarese (1795-1855), a psychiatrist at the Aversa mental asylum near Naples and author of a treatise on phrenology.[12]

Thus, the evolution of Della Porta's thoughts re-

turned to Naples via a complex and circuitous route from Germany. However, by this time, phrenology was already in decline. The influence of Della Porta's initial ideas waned, with later Neapolitan scholars such as Leonardo Bianchi and Antonio Cardarelli moving away from Gall's theories.

The timeline reasoning

Physiognomy - the science of assessing a person's personality based on their outer appearance - was not an invention of Giovan Battista Della Porta. In his treatise, Della Porta extensively discusses two earlier authors: Polemon and Adamantius, and frequently refers to Aristotle.

The earliest known treatise on the subject is likely *Physiognomonics*, attributed to pseudo-Aristotle and dated to the 4th or 3rd century BC. The topic may have been addressed even earlier, but this represents the first extant account. It was followed by similar works, including treatises in Greek by Polemon of Laodicea (*De Physiognomonia*, 2nd century AD) and Adamantius (*Physiognomonica*, 4th century AD), as well as a Latin text (*De Physiognomonia*), attributed to an anonymous author from the same period.

Following a period of translation into Arabic (see Table 1), there was a long interval without new contributions to the field. This gap ended with *Liber physiognomiae* by Michael Scot in the early 13th century. A list of these historical treatises is presented in Table 1.

Then, in 1586 we finally have *De humana physiognomonia* by Della Porta.[13] His treatise is a transition point between the magical culture of the 1500s and the rationalistic thought of the 1600s. Della Porta travels extensively in Europe and, for two years after his return to Naples, dedicates himself to writing work on physiognomy.

However, an external constraint made the treatise notably distinct from its predecessors. The Bull of 1586 issued by Pope Sixtus V prohibited the practice of magical arts and even the possession of books on such subjects. As a result, Della Porta was compelled to exclude any reference to magical notions, including astrology, which had been central to earlier physiognomic texts. Paradoxically, this act of censorship was

Table 1. Treatises on physiognomics before Della porta

Year	Country	Author	Title
4th century BC	Greece	pseudo-Aristotle	Physiognomonics
2nd century AD	Greece	Polemon of Laodicea	de Physiognomonia
4th century AD	Greece	Adamantius	Physiognomonica
4th century AD	Rome?	Anonymous	de Physiognomonia
9th century AD	Abbasid Caliphate	Hunayn ibn Ishaq	Kitab al-Firasa (Book of Physiognomy)
10th century AD		Al-Razi (Rhazes)	Kitab al-Firasa (Book of Physiognomy)
12th century AD	Spain	Abu al-Qasim al-Zahrawi (Albucasis)	Kitab al-Tasrif
12th century AD		Fakhr al-Din al-Razi	Al-Firasa
About 1209 (printed 1477)	Scotland	Michael Scot	Liber physiognomiae
1474	Italy	Pietro D'Abano	Liber compilationis physionomiae
1503	Italy	Alessandro Achillini	De chyromantie principiis et physionomie
1504	Italy	Bartolomeo della Rocca (Cocles)	Chyromantiae ac Physiognomiae Anastasis
1573	Switzerland	Paracelsus (Theophrastus von Hohenheim)	De Natura Hominis (On the Nature of Man)
1522	Germany	Johann von Hagen (de Indagine)	Physiognomia et Chiromancia
1544	Italy	Michelangelo Biondo	De cognitione hominis per aspectum
1551	Italy	Luca Gaurico	Aristotelis physiognomia Adamantio interprete
1558	Italy	Gerolamo Cardano	Metoposcopia
1586	Italy	Giovanbattista della Porta	De humana physiognomonia

necessary to produce original thought. In fact, Della Porta would not have had an important part in this story without censorship, since he was drawn by the medieval magical/divinatory aspect of physiognomy (as demonstrated by his treatise *Coelestis physiognomoniae* in 1603),[14] even though he declared himself against astrology. Deprived of astrological references, Della Porta turned instead to zoomorphism, already present in previous treatises, as an element of systematic study: The notion that a person's facial resemblance to a specific animal might indicate analogous traits or behaviours became a key element of his system, opening the way for empirical inquiry and subsequent experiments.

De humana physiognomonia is an extensive analysis of the observations of Polemon and Adamantius, who are cited more than 500 times throughout the text. For comparison, Hippocrates is mentioned 50 times, Galen over 100, and Aristotle fewer than 50.

Its major point of originality was a reference to internal organs, which were not reported in previous books on physiognomy by pseudo-Aristotle, Polemon, and Adamantius, all of whom are acknowledged in Della Porta's work. This innovation may have stemmed from medieval influences, particularly alchemical and magical notions concerning the 'secrets' of nature. Meanwhile, astrology was not only banned but also undergoing a transformation into astronomy, a shift facilitated by the telescope, which was perfected by both Della Porta and Galileo.

In summary, classical timeline reasoning shows that an idea travels over time from one scientist to another, with modifications during the rewriting process. When an idea cannot be passed along - whether due to the loss of written sources or a lack of intellectual heirs - it is forgotten. A clear example is Egyptian hieroglyphics, which became indecipherable for centuries during the late Roman, Medieval, Renaissance, and Romantic periods, only regaining intelligibility in the late 1700s to early 1800s.

While timeline reasoning helps us understand how ideas are transmitted and altered over time, it does not, on its own, explain the conditions required for a radical transformation in those ideas.

Geoscientific reasoning

Geoscientific reasoning hypothesises that when an idea enters a cultural environment markedly different from those in which it previously developed, it is more likely to undergo a significant transformation. This approach requires careful analysis of the contextual conditions that foster the emergence of new ideas.

Regarding the case study of Della Porta's physiognomy, three elements are relevant:

1. The proliferation of "academies" or cultural circles in Italy
2. The creation of "hospitals for incurable people", which drew attention towards phenomena pertaining to mental illness
3. The need among painters to depict human emotions through visual representation

Naples, with its rich academic tradition - including the Academy of Secrets, the Academy of Investigators, the Academy of Sciences - and its University, experienced periods of scientific innovation under various regimes, notably during the Kingdom of Sicily citra farum (1302-1816), the Kingdom of the Two Sicilies (1816-1861) and later, the Kingdom of Italy.

Numerous academies were established in Naples from the sixteenth century onwards (Figure 2).

Giovanbattista della Porta himself founded the first scientific academy in Europe: the Academy of Secrets (1560), as cited by Girolamo Ruscelli.[15]

This proliferation of what we would call today "clubs" reflected a broader cultural trend across Italy, as reported in Figure 3. These academies were numerous, though typically short-lived due to a lack of organisation and structured programmes - with a few notable exceptions. They served as alternatives to universities, eschewing Latin in favour of the vernacular, and addressing topics, methods, and lines of inquiry not typically covered in academic institutions. Thus, they were not in direct competition with universities; rather, they often complemented specific university disciplines.

Joining an academy was akin to joining a club: it offered an appearance of prestige, access to networks, support for publishing, and potential career advantages. Many required initiation rites reminiscent of Masonic traditions. Some established branches in several cities across different states; for example, the Partenia Academy (founded in 1560) had chapters in Siena, Naples, Ferrara, Milan, and Rome. Typically, a wealthy aristocrat would sponsor and lead the academy's activities. It would be of interest for future research to investigate why this proliferation of academies began to decline by the nineteenth century. Perhaps the phenomenon did not disappear entirely, but rather persisted under different names, particularly in the Anglo-Saxon world, while the term "academy" itself fell out of favour.

Alongside the founding of Academies, private collections of "marvellous" items also began to emerge.

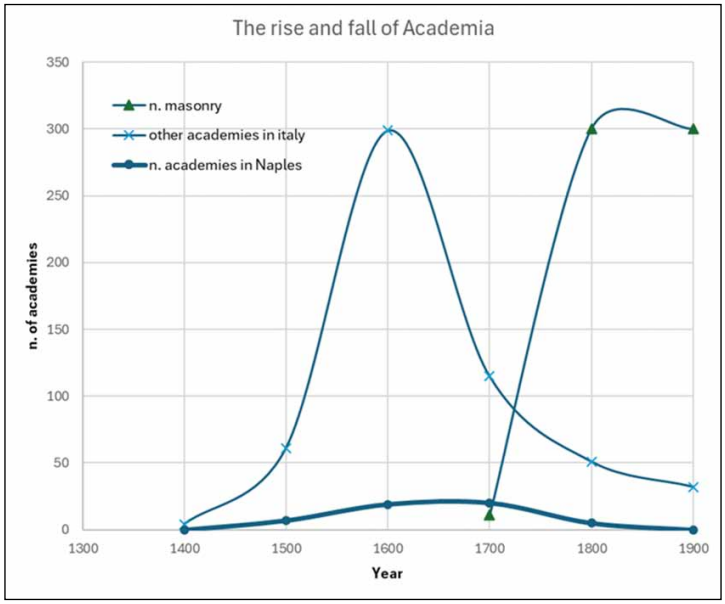

Figure 2. The rise and fall of academies in Italy and in Naples.

In Naples, a notable example was the collection of Ferrante Imperato (1525–?), in the Santa Chiara Square. This collection reflects the scholarly travels of the time, particularly to Frankfurt, home to the seventeenth century's most important European book fair. Imperato's motivations may have been linked to his profession as an apothecary or pharmacist, seeking ingredients for medicinal preparations.

From this large collection, one book of the herbarium survives at the National Library in Naples. Imperato's personal museum enjoyed great success and attracted important visitors such as B Maranta (Della theriaca et del mithridato, libri due, Venezia 1572, p. 35), NA Stigliola, F Cesi, F Colonna, T Campanella, G Donzelli, MA Severino, Johann Faber (1574-1629) and GB Della Porta himself.

In addition to the academies, which promoted intellectual exchange and the circulation of ideas, two further developments in Naples are of interest: the establishment of an institution to house melancholic and mentally ill individuals, the Incurabili Hospital, and the emergence of small private museums.

The Hospital of Saint Mary of the Incurable People (Santa Maria degli Incurabili) in Naples was founded in 1519 by the noblewoman Maria Lorenza Longo (1463–1539), originally from Lleida, Catalonia.[16] It is important clarify that the term hospital (*hospitali*) at that time was used with the meaning of *hospes*, meaning a place of hospitality rather than a centre of medical treatment; a more accurate modern translation would be "hostel".

This institution reflected a broader trend in Italy of private initiatives for founding hospitals/hostels to shelter the poor (ospedali dei poveri) or the chronically ill. Similar establishments for "incurable people" were founded in several Italian cities: the Ospedale di San Giacomo degli Incurabili in Rome (1339), the Ospedaletto in Genoa (1499), the Santissima Trinità degli Incurabili in Florence (1520), and an institution in Venice (1522) to house sufferers of syphilis (then known as the "Naples disease"), leprosy, and the plague. Saint Gaetano Thiene (Vicenza, 1480 - Naples, 1547) was involved in the founding of the Naples, Rome, and Venice hospitals.

Finally, the Renaissance in Italy witnessed a revival of interest in physiognomics, driven in part by the needs of painters and artists. To represent emotions and character convincingly in visual form, artists required some theoretical framework. This demand likely contributed to the renewed attention paid to earlier physiognomic treatises in Italy, where artistic production was flourishing.[3]

This dynamic of the knowledge production flying away form its birthplace and then returning back to it is beautifully captured by the epigram inscribed above the door of the Aula at Athens Academy: "*The Muses, living in Freedom, wandering for long time abroad, returning back to the much - desired Greece, they dispense again to the Greek youths gifts close to their hearts*", which evokes the return of ideas to their native soil after circulating through diverse intellectual landscapes.

ΠΕΡΙΛΗΨΗ

Η χωροταξική δυναμική της γνώσης: Η διανοητική μετάβαση από τη Φυσιογνωμική στην Φρενολογία

Davide Viggiano

Η μελέτη εξετάζει την ιδέα ότι η χωροταξική δυναμική της παραγωγής γνώσης είναι κρίσιμη για την προώθηση καινοτόμων ανακαλύψεων. Για να απεικονίσουμε αυτή την ιδέα, εντοπίζουμε τη διανοητική μετάβαση από τη φυσιογνωμία στη φρενολογία, χαρτογραφώντας την προέλευσή της από τη Νάπολη στη Γερμανία. Στη Νάπολη, έναν κόμβο ακαδημαϊκής καινοτομίας υπό διάφορα καθεστώτα, το έργο του Giovanbattista della Porta του 16ου αιώνα για τη φυσιογνωμία, De Humana physiognomonia, έθεσε τις βάσεις για μελλοντικές εξερευνήσεις στη σχέση σώματος-προσωπικότητας, κυρίως επικαλούμενος τον Κρόνο για να χαρακτηρίσει μελαγχολικά χαρακτηριστικά. Στην Αγγλία, το Religio Medici του Sir Thomas Browne και στη Γερμανία, τα Δοκίμια για τη Φυσιογνωμία του Johann Kaspar Lavater αντλήθηκαν από το έργο του Della Porta. Η έμφαση του Lavater στη σχέση μεταξύ των χαρακτηριστικών του προσώπου και της προσωπικότητας άνοιξε το δρόμο για τις φρενολογικές θεωρίες του Joseph Gall και του Johan Spurzheim, οι οποίοι μετατόπισαν την εστίαση στην κρανιακή μορφολογία ως ενδεικτική των χαρακτηριστικών της προσωπικότητας και προσδιόρισαν το «όργανο» της μελαγχολίας κάτω από τα βρεγματικά οστά. Αυτή η μετατόπιση προκάλεσε ένα ανανεωμένο ενδιαφέρον για τις σχέσεις νου-σώματος πάλι πίσω στη Νεάπολη, κυρίως μέσω μορφών όπως ο Miraglia, αν και η υποδοχή ήταν μικτή και αντιμετώπισε ισχυρή αντίσταση. Ενώ επηρέασε για κάποιο διάστημα, η επιρροή της φρενολογίας εξασθένισε καθώς η προσοχή στράφηκε, κάτω από μορφές όπως ο Bianchi, προς τις εσωτερικές δομές του εγκεφάλου και όχι προς τα εξωτερικά περιγράμματά του. Αυτή η δυναμική της παραγωγής γνώσης που πετάει μακριά από τη γενέτειρά της και στη συνέχεια επιστρέφει πίσω σε αυτήν αποτυπώνεται όμορφα στο επίγραμμα που είναι χαραγμένο πάνω από την πόρτα της Αίθουσας Τελετών στην Ακαδημία Αθηνών: «Οι Μούσες, ζώντας στην Ελευθερία, περιπλανώμενες για μεγάλο χρονικό διάστημα στο εξωτερικό, επιστρέφοντας πίσω στην πολυπόθητη Ελλάδα, μοιράζουν και πάλι στους Έλληνες νέους δώρα κοντά στην καρδιά τους», το οποίο παραπέμπει στην επιστροφή των ιδεών στην πατρίδα τους μετά την αποδημία τους σε ποικίλα πνευματικά τοπία.

Λέξεις Κλειδιά: *Δυναμική της παραγωγής γνώσης, Φυσιογνωμική, Φρενολογία*

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The social advancement of 19th century Greek National Benefactors: The example of Apostolos Arsakis and Constantine Bellios, related to the field of Medicine

Efi Poulakou-Rebelakou[1], Maria Mandyla-Koussouni[2], Athanasios Diamandopoulos[3]

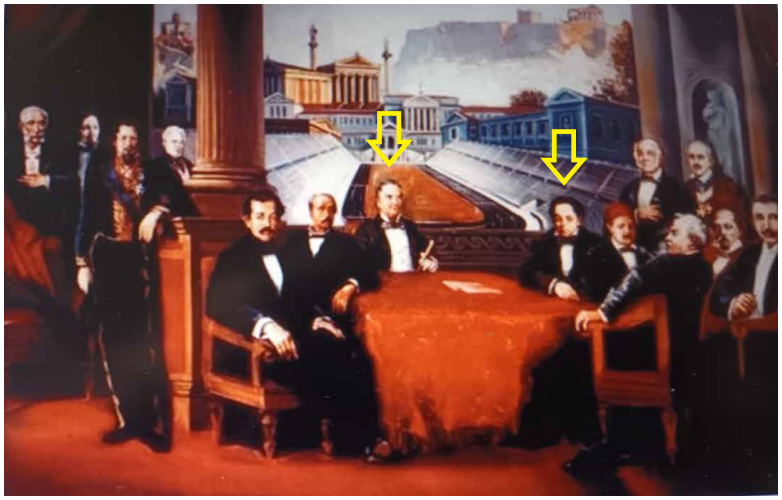

Figure 1. "The Meeting of the Leaders" by Josef Kote, (c.1998). Oil on Linen, Athens, Private collection. Apostolos Arsakis is seated centrally, holding a cigar. Bellios is sitting next to him to his left. www.thessalonikiartsandculture.gr

Abstract

The study of the history of medicine has expanded considerably to encompass its connections, among others, with literature, the visual arts, poetry, bioethics and sociology. The branch of the latter that analyses medical organisations and *institutions* and examines how social and cultural factors shape health and medicine, is termed medical sociology.[1] However, although as early as 1894 Charles McIntire defined medical sociology as 'the science of the social phenomena of the physicians themselves as a class apart and separate'[2] the collective social advancement of medical practitioners and donors to health institutions has been scarcely investigated. We therefore undertook the present pilot study.

Our research, initiated with a painting depicting a group of predominantly nineteenth-century Greek benefactors, aims to present the lives and works of two prominent figures among them: Baron Konstantinos Bellios and Apostolos Arsakis (known in Romania as Apostol Arsache), both closely associated with medicine and medical institutions. In addition to the biographies of these two eminent benefactors, the study explores in depth the social trajectories of these once impoverished, uneducated Vlach boys who rose to become wealthy, educated, aristocratic Greek national benefactors.

Key Words: *Apostolos Arsakis, Konstantinos Bellios, Physician-politician, Romania, National benefactor, Austria-Hungary, National identity*

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Introduction

An historical picture

Our research started with a painting depicting a gathering of predominantly nineteenth-century Greek benefactors. Executed in 1998 by the Connecticut-based Albanian artist Josef Kote (Joseph Kottas - born 1964 in Vlorë, Avlona in Greek),[3] the work, entitled *The Meeting of the Leaders*, depicts illustrious patrons of the modern Greek state and was commissioned for the Hellenic Cultural Union in Thessaloniki during the period in which Kote resided in Greece. Among those represented are Georgios Averoff, Georgios Sinas, Konstantinos Zappas, Apostolos Arsakis and Konstantinos Bellios; the last two are closely associated with medicine and medical institutions (Fig. 1).

Most of the figures in the painting hail from the region depicted in figure 2.[4]

It was inhabited by a mixture of Greeks, Ottomans, Albanians and mainly Aromanoi. However, during the period when these boys - for they were mere boys when they departed from their homeland, religious affiliation was the principal marker of identity. The Aromanoi, also known as Vlachs, were dispersed across several provinces that would later form independent states such as Greece, Albania, Serbia, Bulgaria, and Romania. In time, they distinguished themselves by the direction of their national sympathies, either towards Greek, Albanian or Romanian identities. This inclination towards a Greek identity evolved into an ardent and unquestionable self-identification as Greeks, underpinned by strong elements of Christianity and Enlightenment ideals. The latter two elements played a pivotal role in Greece, where the reverence for classical civilisation served as a catalyst for national pride - a pride that had been nearly extinguished in its place of origin - and the ideal of the nation-state became synonymous with the aspiration for liberation from Ottoman rule and the "Europeanisation" of the country, without severing its cultural roots. In accordance with Historicist principles, such ideas found direct expression in the visual art of the epoch; historical compositions and patriotic scenes illustrating recent events assumed ever-greater prominence[5]. Having provided this historical context, we now proceed to the biographies and activities of Konstantinos Bellios and Apostolos Arsakis.

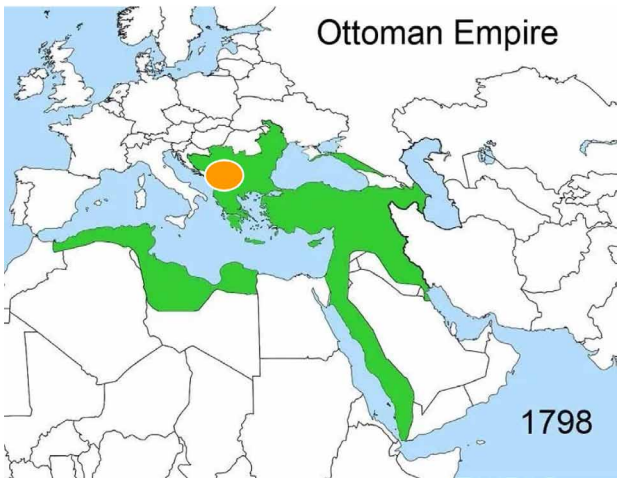


Figure 2. The Ottoman Empire around the time the young benefactors left their homeland. Later it was divided into National States. The orange spot depicts roughly the area they originated from.

Konstantinos Bellios (1772-1838)

His Aromanian ancestors left southern Albania and settled in Vlasti, in the Kozani Prefecture of Greece. Konstantinos was born in Linotopi, in the Kastoria region, on 7 March 1779, but spent his childhood in Vlasti. His parents were Demetrios Bellios and Despoina. Demetrios later moved to Constantinople, and his two sons, Stephanos and Konstantinos, followed him there to continue their studies. In 1812, Konstantinos and Stephanos accompanied Ioannis Karatzas, the newly appointed hospodar (ruler) of Wallachia, to his province. Ioannis was the son of George Karatzas, personal physician to Sultan Mahmud II, and grandson of Georgios Skarlatos Karatzas, who was also a distinguished doctor (Fig. 3a, b).

The brothers settled in the Wallachian capital Bucharest, where Stefanos rose to the position of Logothetes (Minister) of Justice. Konstantinos Bellios received a thorough education at the Greek Gymnasium of Bucharest and embarked on a career in commerce and finance. At the age of twenty, he translated *Robinson Crusoe* into Greek from the German edition (*Του νέου Ρόμπινσον συμβάντα*). Eventually, he relocated to Vienna, where, on 24 February 1817, Emperor Francis I of Austria ennobled him with the title of Baron von Bellios. Following the establishment of the independent Kingdom of Greece, Bellios expended much of his fortune on charitable donations and benevolent works, "*to assist and be of use to my homeland at a time when it is beginning to rise again*". One of his most significant contributions was to the foundation of the Elpis Hospital in Athens, the first civic hospital established in Greece after the Independence[6].

The hospital was constructed between 1836 and 1842, based on designs by the architects Stauffert, Schaubert, and Hansen. Among the earliest donors were King Ludwig I of Bavaria (1786-1868), father of

Figure 3. a: Karatzas family coat of arms, athensfirstcemeteryinenglish.blogspot.com › 2018 Athens First Cemetery in English: Ioannis Karatzas - Blogger, b: Prince Ioannis Karatzas of Moldovlachia (1754–1844). Oil on canvas, 60,5 x 50,5 cm, Italian manner portrait, 19th cent. National Gallery Museum, Inv. Number Π.6047.

King Otto of Greece, who contributed 65 phoenixes (equivalent to 6.45 drachmas); the diplomat and politician Alexandros Mavrokordatos (1791-1865); Sophie de Marbois-Lebrun, Duchess of Placentia (1785-1854); I. Kontogiannakis (1817-1888), Honorary Consul General of Greece in Russia; and Rallou Mourouzi (1788-1860), wife of the Phanariot Prince Konstantinos Mourouzis (1786-1821). The Hospital comprised two clinics: an internal-medicine clinic, headed by Ioannis Olympios (1802-1869), and a surgical clinic, headed by Professor Ioannis Vouros (1808-1885)[a].

The building was initially constructed as a mezzanine structure, with only the central section completed. In 1856 two additional wings were added during a subsequent construction phase (Fig. 4).

From the outset it was designated "Civic", in order to distinguish it from the military installation erected beneath the Acropolis.[7] It was built in a simple neoclassical style. More broadly, the neo-classical hospitals of the period, by their very appearance, underscored the authority of modern Western medical science. From 1842 onwards, similar hospital buildings were erected in Athens, Mesolongi, Chalkida, Patras, Mytilene and Volos. After 1880 a limited romantic, rustic influence can be observed.[8]

Bellios donated all his property in Attica, valued at 5,000 drachmas, to the Greek State for the hospital's construction. His generosity, however, was not met with the anticipated gratitude. He was obliged to threaten the Mayor of Athens, Anargyros Petrakis, through public notices in the newspapers, in order to compel acceptance of the donation: *"I ask the Mayor's Office through your newspaper to appoint people within four days to take over the estates, since I wish to take other measures and other decisions after this deadline has passed!"*.[9] The 1842 Elpis building was soon deemed inadequate for the hospital's expanding needs and the Board resolved to erect a new structure. Between 1907 and 1908 the Municipality of Athens, facing financial stringency, decided to sell the first hospital building at 50 Academy Street for 1,300,000 drachmas; the sale, however, was never completed. The new Elpis Hospital was ultimately inaugurated sixty-seven years later, and the original Elpis premises were converted into the Athens Municipal Cultural Centre. Only a few relics are preserved (Fig 6).

Bellios remained in Athens for three months, from December 1836 to March 1837, during which time he kept a diary of his activities and impressions. This diary was published in 2018 by Dr Vassileios Bellios, who regards Konstantinos as a probable ancestor.[10] Overall, Bellios was disheartened by the poverty of Athens, the deplorable conduct of local dignitaries, the arrogance shown towards the

a Ioannis Vouros (1808-1885) was born on the island of Chios. In 1825 he travelled to Vienna to study medicine, and in 1832 he earned his doctorate at Halle, Germany. He then returned to Greece, where in 1836 he was appointed Professor of Special Nosology at the University of Athens (then the Othonian University). A pioneering contribution relevant to the Elpis Hospital was his treatise About Hospitals, printed in Paris in 1831 (Fig. 5).

Figure 4. The Elpis Hospital at 50 Academias Str. in Athens, 1920.

Figure 5. Front page of Ioannis Vouros's treatise "About Hospitals".

heroes and benefactors of the 1821 Revolution, and their continual petty disputes[a]. In striking contrast, he was received with honour by King Otto, who invested him with the Order of the Redeemer. In return, Bellios presented the King with an eleventh-century sword and gave Queen Amalia a rare edition

a In the Diary of 1837, Bellios reflects: "And on this occasion my soul experienced an inward sadness, seeing Master Karatzas, the ruler of Wallachia - whom not only Wallachia and the Danubian regions feared, but also many noble men and Turkish pashas - standing in line with so many Gecchides and the simplest Ministers, like a mere man through which the King and the Queen were destined to pass".

Figure 6. Three pharmaceutical jars from the initial Elpis Hospital. They are made by the Parisian porcelain factory Gosse, which operated from 1849 to 1878. This type of medicine container is relatively rare and is an obvious imitation of Chinese porcelain jars, which until then dominated international trade. The lot was offered as gift for his name day to the then Mayor of Athens and President of the Hospital Georgios Plytas, in 1966. Courtesy of Professor Marios Marselos.

of Homer. During his stay in Athens, he became acquainted with Kyriakos Pittakis, Director of the Greek Archaeological Service. Other notable acts of benefaction included providing funds for the establishment of the Archaeological Society of Athens in 1837 and the founding of the Nea Pella settlement at Atalanti for Macedonian refugees who had fled south during the Greek War of Independence. His extensive library was initially donated to the Nea Pella settlement but was later transferred to the National Library of Greece. He died in Vienna on 23 December 1838 (Fig 7).

Apostolos Arsakis

Apostolos Arsakis (Apostol Arsache in Romanian) was one of the principal benefactors of 19th-century Greece, while simultaneously rising to prominence as a leading political figure in Romania. A remarkably gifted individual, he was an eminent physician - one of the first qualified oculists in Europe and the first in the Balkans to obtain the relevant university degree - as well as a distinguished politician. A right-wing Romanian statesman, he even served as interim Prime Minister. As a national benefactor of Greece, he donated substantial sums to support the education of girls and to finance the construction of an impressive building in the centre of Athens, the Arsakeion, from which generations of young women would graduate.

Figure 7. Stamp on a book of the Bellios donation with his name and the date of the offer in the perimeter and his coat of arms in the centre.

Life and studies

Apostolos Arsakis was born in Hotahova (modern Hotovë), a village near Përmet in the Ottoman Empire (now Albania), although the exact date of his birth remains uncertain (circa 1792). As there were no prospects for material advancement or education in the barren region of Northern Epirus for the non-Muslim populations, the Arsakis family decided to migrate to more prosperous and freer lands, such as Wallachia, one of the two Danubian Principalities. Wallachia and Moldavia were under the suzerainty of the Sultan but not directly subjected to Ottoman rule, as were most of the other Balkan territories. The ruling class of Wallachia at the time was largely composed of Phanariots - Greeks from Constantinople residing near the Patriarchate at Phanari. Apostolos' uncle, Gheorghe Arsakis, was the first to migrate to Bucharest, where he achieved considerable success. As his economic status improved, he invited his brother Kyriakos' family to join him in Wallachia in 1800. Gheorghe and Kyriakos became prosperous merchants, and Apostolos received an excellent education from private tutors. Until that point, he had not spoken Greek; nevertheless, he mastered the language perfectly through his studies. It was Uncle Gheorghe who first recognised the extraordinary intellectual talents of his nephew and proposed that the family send him to Vienna to continue his education and support his further studies.[11]

Apostolos arrived in Vienna in 1804 and primarily studied philosophy. His teacher was the renowned Neophytos Doukas, a prominent figure of the Neo-Hellenic Enlightenment. Doukas, who had arrived in Vienna in 1803 as the priest of the city's Orthodox Church, had a profound influence on the young Arsakis. Under Doukas' tutelage, Apostolos studied the entire corpus of ancient Greek literature and learned Ancient Greek.

On 17 May 1810, he commenced medical studies at the University of Halle, Germany. Two years later, on 11 March 1812, he was awarded his doctorate in Medicine and Surgery. Meanwhile, in 1811, while Arsakis was still a student, Napoleon Buonaparte visited Halle. He had recently fathered a child with Marie-Louise, Princess of Habsburg - the infant known as L'Aiglon (The Eaglet). Arsakis composed an idyl (following the tradition of Theocritus' Idylls), which he dedicated to the Emperor of France in the hope of securing his support for the liberation of Greece. The poem reflects his fervent patriotic sentiment:

«Ω! πατρίδα! πατρίδα! Ω! δύστυχη γη τής Ελλάδος!

Μητέρα τής ελευθερίας και πατρίδα τόσων ημιθέων, είσαι δούλη, συ, που πριν ήσουν ελεύθερη και καλότυχη.

Εδώ κάποτε οι αθάνατοι, αφού άφησαν τον θαυμαστό Όλυμπο, περπατούσαν ευχαριστημένοι και συναναστρέφονταν τα παιδιά σου.

Όλα άλλαξαν και τελείωσες και συ, χρυσή εποχή»

*(Oh, my poor country! Mother of freedom and land of many semi-gods, you are now enslaved, you, who had been so fortunate. Here, someday, once the immortals left the admirable Olympus were walking with pleasure, socializing with your children. Everything changed and the golden era finished.)**

**Translation by Athanasios Diamandopoulos.*

Arsakis subsequently travelled to Italy, where he wrote his doctoral thesis in Latin, entitled *Piscium cerebro et medulla spinali* ("On the Brain and Spinal Cord of Fishes"). This work was highly praised by his professor, the eminent anatomist Johann Friedrich Meckel, and was considered a significant contribution at the time. Ichthyology, the study of fish, was considered a particularly challenging specialty, and thus Arsakis was regarded as a pioneer.

For a period, Arsakis seemed to entertain ambitions of pursuing an academic career at his alma mater, the University of Halle. However, he ultimately altered his plans and moved to Vienna in 1813. There, he attended the ophthalmology lectures of Georg Beer - renowned for the Beer operation for cataract removal and the invention of the Beer tool - who required his students to complete a year's practical work as oculists at Vienna Hospital. Arsakis remained in Vienna for a full year, during which time he composed all his written works in Greek. Subsequently, he continued writing in French and Romanian, addressing mainly social and political subjects.[12]

In 1813, Arsakis authored a treatise titled *Ἔκθεσις συνοπτικὴ τῆς Ἰατρικῆς Ιστορίας* (Concise Report of

the History of Medicine) in Ancient Greek. It was published in *Hermes o Logios*, the Greek journal edited by Anthimos Gazis in Vienna. This work presented the evolution of medical science across Ancient Greece, Egypt, Israel, Persia, Assyria, and China. However, the publication was abruptly discontinued at issues 14-15 of 1813. Disillusioned by the conflicts among the representatives of the Neo-Hellenic Enlightenment, Arsakis returned to his family in Bucharest in 1814. There, Ioannis-George Karatzas, the Greek ruler of Wallachia, appointed him as his personal physician and private secretary. Arsakis was later held in high esteem by Karatzas' successor, Alexander Soutsos. Arsakis was then appointed Chief Physician of Wallachia and became a member of the scientific staff at Colțea Hospital, as well as a participant in several philanthropic committees. Colțea Hospital, established in 1704, continued to operate after renovations in 1888. For eight years, Arsakis practised medicine in Bucharest with notable success. He contributed significantly to combating the plague epidemic of 1828-1829 and the cholera epidemic of 1831. At the same time, he served as personal secretary to Gregory IV Ghika, the Phanariot Greek (of Vlach descent) ruler of Wallachia, and managed the Secretariat of Foreign Affairs. This marked the turning point in Arsakis' life: he gradually abandoned his medical career to embark upon a distinguished political path.

Family life

Arsakis' family life was far from peaceful. His first wife, Eleni Darvari, was the daughter of the Macedonian physician Constantin Darvaris, a scion of the prominent Darvari boyar family. Through this marriage, Arsakis achieved not only financial but also significant social advancement, entering the ranks of the Romanian aristocracy.[12] Eleni died in 1832 and was buried outside the church constructed in 1834 by her family, mainly through the efforts of her brother, Michael. The original church was entirely demolished between 1933 and 1934 and replaced with the current structure, whose interior was painted with Athonite-style frescoes by the artist Iosif Keber. Today, it remains a recognised historical monument.[13] After Eleni's death, Arsakis remarried, to Anastasia, and lived harmoniously with her. However, he suffered the loss of his second wife as well. In her memory, he requested that the church of the Arsakeion be dedicated to Saint Anastasia. Arsakis' son, George Arsakis (1815-1835), studied philosophy in Vienna, where he fell in love with a Jewish woman and intended to marry her. Apostolos, firmly opposing this union, persisted in his opposition to the extent that the young couple ultimately took their own lives[aa,14,15a,b]. This tragic event profoundly shocked Arsakis and brought about a lasting change in his character. He commissioned the construction of a Church of Christ the Saviour, painted by Gheorghe Tattarescu. In its murals, one scene depicted the young couple, and another Apostolos himself, accompanied by the Angel of Reconciliation - an allegorical representation of his too-late consent to their marriage.

Political career

In 1859, Alexandru Ioan Cuza (1820-1873) was elected Prince Regnant of the newly united Principalities of Moldavia and Wallachia.[16] Apostolos Arsakis, at that time, served as deputy chief of the Conservative Party of Wallachia He had first been elected as a deputy to the Parliament of Wallachia in 1857.[17] Between 1857 and 1859, he worked actively towards the unification of Wallachia and Moldavia, a pivotal step in the formation of Romania. Many European nations, like Italy and Germany, gained their political unity in the second half of the 19th century, the so-called "Century of the Nations." Romania began this process at about the same time.[18] The birth of the united Romanian state bears his imprint. In the cabinet of 1862, Arsakis was appointed Minister of Foreign Affairs - the first to hold this position in the newly formed Romania - serving from 22 January until 24 June 1862, when he was succeeded by Alexandru Cantacuzino. Following Catargiu's assassination on 2 June 1862, Arsakis briefly served as interim Prime Minister of Romania from 8 to 23 June 1862.[19] However, fearing that he might meet a similar fate, he quickly resigned. He was succeeded by Nicolae Crețulescu. Between 1862 and 1865, Arsakis remained a deputy in Parliament, but in 1866 he retired from political life and withdrew to his mansion.

National benefactor

Arsakis decided to contribute to the advancement of Greece - a country he always considered his own,

a *A repetition of such a tragic event, albeit on a grander scale, occurred on 3 January 1889 at the imperial hunting lodge of Mayerling. Crown Prince Rudolf of Austria-Hungary and his mistress, Baroness Mary Freiin von Vetsera, committed suicide, largely due to Emperor Franz Joseph's opposition to their extramarital relationship, compounded by Rudolf's unstable personality.[14] A similar, though more minor, repetition took place nearly eighty years after the suicide of Arsakis' son, in Tbilisi, Georgia - then part of the Russian Empire - when Costas, the eldest son of the newly ennobled clergyman Georgios Haritithis, a talented painter, ended his own life. His father (who was also the great-grandfather of the third author of this article) had opposed his planned marriage to his mistress, an Armenian and communist woman.[15a,b]* This was an era in which, when confronted with a painful conflict between the demands of parental authority and the dictates of romantic passion, a dramatic escape through suicide was not uncommon.

as he declared during the 1838 census - recently liberated from Ottoman sovereignty. In 1850, he offered a substantial sum for the establishment of a female educational institution in the Greek capital, donating 6,000 golden drachmas towards this endeavour. His friends in Athens had informed him about the existence of the Philekpaideftiki Etaireia (Greek Society for Promoting Education and Learning)[20] (Fig 8).

They also apprised him of the Society's dire financial situation: by 1846, it had exhausted its funds in its attempts to realise the construction of a new educational facility. It came as a great surprise to the Greek public when, in 1850, Arsakis announced that he would not only cover the remaining costs for the entire building but would also reimburse the expenses already incurred for purchasing the land in the centre of Athens. In this context, Arsakis appeared as a deus ex machina for the cause of girls' education in the nascent Greek State. His contribution embodied the ideals of the so-called "Balkan Enlightenment",[21] influencing both Greece and Romania, the country where he had resided from his youth until his death. The impressive building completed thanks to Arsakis' generosity still stands today in the centre of Athens[22] (Fig 9).

For the construction of the building, soldiers transported "*unnecessary stones*" from the Acropolis. Although this practice, approved by King Otto, is today regarded as unethical from an archaeological perspective, it underscores the importance then attached to the establishment of this girls' school and the societal role it was intended to fulfil. The institution was named Arsakeion in honour of its benefactor. **"*At the end of one of the wings was the students' hospital, a ward of considerable dimensions with a number of beds, as well as a convalescent room, a modest library, a small pharmacy, a kitchen, and other necessary facilities*".**[23] Arsakis, while keeping informed everything about the Arsakeion, never visited Athens personally. He withdrew at his country house at Vedea (Fig 10).

The relationship between Arsakis and the Philekpaideftiki Etaireia was not without complications. His request that the school bear his name was accepted only reluctantly and after some delay by the governing board. Eventually, his name was inscribed above the school's main entrance (Fig 11).

Similarly, a condition of the donation was that three annual scholarships would be awarded to students of his own choosing. This led to the exchange of numerous

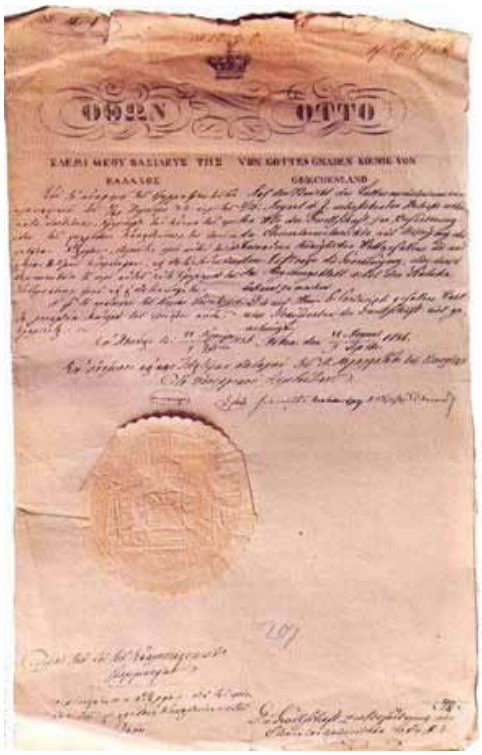


Figure 8. The Royal Decree by King Otto for the foundation of the Philekpaideftiki Etaireia, presented bilingually in Greek and German to ensure comprehension by both Greeks and the Bavarian settlers in Greece.

Figure 9. a: Bird's eye view of the Arsakeion, b: Its façade on Panepistemiou Str., Athens.

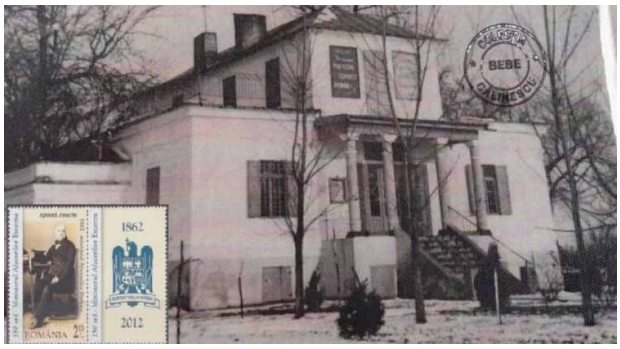


Figure 10. Apostolos Arsakis' country house at Vedea, Romania. On the left - commemorative postal stamps issued on the occasion of the 150th anniversary of the founding of Romania's Foreign Office, depicting Arsakis, who played a vital role in its creation. From a bilingual Romanian-Greek edition of the bilingual publishng house Omonia.

Figure 11. The Arsakeion name inscribed prominently on the lintel above the School's main entrance.

argumentative and often bitter letters, with Arsakis - like Bellios before him - threatening to revoke the donation. It was only due to the strong intervention of Queen Amalia that the disputes were ultimately resolved.[24]

On 16 July 1874, "the handsome Greek" died at a very advanced age. On the eve of his death, he wrote a letter to his friend Nikolaos Hatzopoulos in Athens: "*My lamp is extinguishing, my friend Nikolaos, not only because of the lack of oil, but also because no one can provide it*".[25] The announcement of his death caused great emotion in Greece. The students and teachers of the Arsakeion mourned for four days. Newspapers all over the world reported on his life and praised his philanthropic work. Yet Arsakis, ever faithful to the guiding principle of the Greek-speaking diaspora of Romania - "*to love Greece, but from afar*"[26] - never set foot in the country he so generously supported. To this day, at every graduation ceremony at the Arsakeion, the students sing the Hymn to Arsakis.

Discussion

We begin with an examination of Kottas' painting and subsequently will elaborate on three elements pertinent to the benefactors' social advancement: first, the clothing worn by the figures; second, the architectural style of the background buildings; and third, the language "spoken" by the benefactors.

1. Clothing

In *The Meeting of the Leaders*, red curtains are pulled back to reveal fifteen men gathered to discuss the fate of Greece. Each one looks regal and stately in his own way, with dapper suits and full beards; some are even adorned with medals and military dress. The deep red of the curtains connects each element of the foreground, as it colours both the carpet underneath their feet and the tablecloth which rests in the centre of the composition.[3a].

This attire stands in stark contrast to the traditional clothing worn by the Vlachs in their native Epirus (Fig 14).

Thus, they "became" and appeared European, and they proudly displayed their titles in their formal documents and wills. Hence, we read with patriotic admiration of *Baron* Simon Sina, *Baron* Konstantinos Bellios, and *Baron* Michael Tositsas, all of whom are depicted in the painting[b, citations 27,28,29]

Interestingly, a similar pattern of social advancement characterised the lives of the next generations

a Although Kottas' painting was acclaimed by Lamerie as his most structured work, it can scarcely be considered original. We have identified a closely related composition, Theodor Aman's 1861 canvas *Proclamation of the Union of the Principalities of Romania* (Fig. 12a & Fig. 12b). Arsakis - who attended the event - is indicated by an inserted arrow. His participation is documented by the published list of participants Fig. 13. We do not contend, however, that this constitutes artistic plagiarism. Aman's painting conveys the message that the creation of the Romanian state occurred under the auspices of the higher Orthodox clergy, thereby reinforcing the notion of Romania as "Byzance après Byzance". By contrast, Kottas presents the rebirth of modern Greece clothed in an unequivocally classical guise.

b Reflecting on the ennoblement of individuals outside the old landed gentry - a practice adopted by the Habsburgs, Romanovs, Hanoverians, Bourbons, Sultans and both Napoleonic regimes from the late eighteenth to the early twentieth century - it is evident that the arrangement was reciprocal. A notable illustration is the knighthood bestowed upon Henry Solomon Wellcome, the son of a farmer in rural America who became one of the foremost benefactors of the history of medicine[27]. Yet such recently created honours never matched the lustre of their hereditary antecedents: they conferred no substantive power and served principally as tokens of meritocracy rather than of true aristocracy. Members of the ancien régime seldom regarded their bearers as social equals[28]. Notably in Romania, where Arsakis and partially Bellios lived, the old Boyar families reluctantly accepted in their class bankers, scientists and political figures who, due to a changing financial and geopolitical environment, were elevated to the status of nobles[29].

Figure 12. a: The "Proclamation of the Union of the Principalities of Romania", oil painting by Theodor Aman, (1861). National Historical Museum, Bucharest. b: The "Meeting of the Leaders" There is an obvious similarity.

of Greek national benefactors. The majority belonged to the elite circle of extremely wealthy shipowners. Amidst them were members of the Patera, Kolokountis, Livanos, Niarchos families who too endowed Greece with its finest educational, cultural, and healthcare institutions. At the height of their success, they became respected members of the international royal, political, financial, and industrial elites. Evidently, they dressed in a manner consistent with the social bastions of their adopted countries. Nevertheless, their humble origins could not be entirely erased. This reality was bluntly emphasised by the most renowned Greek shipping tycoon, Aristotelis Onassis whom the established shipowners regarded with disdain as an unwelcomed not entirely Greek intruder from the hoi polloi class. In an open letter to the President of the Greek Shipowners' Association in New York in 1947, he scornfully observed: "*Miraculously, then, they are transformed from gypsies to lords*[30]. With his will the finest modern hospital in Greece, the "Onaseion" was founded. A déjà vu of the previous century's "Vlach syndrome" (Fig 15).

2. Architecture

In the background of the Kottas' painting several buildings donated by the persons in the front for housing educational and welfare institutions are drawn in an imaginary coexistence. The Academy of Athens, the Arsakeion School for Females, the Polytechnic School are between them. Most of these foundations, are in operation today, because of the interest accumulated from the original capital deposit The style is distinct neo-classical. In the mid-19th century and later, the architecture of Greek Neoclassicism was established for educational buildings. This is because of the ideological and aesthetic references that created a kind of symbolic relationship between "classical" and "national" in the emergence of public buildings in free Greece.

These buildings reflect the young Greek nation's conviction that it belonged within the European family of progress - materially and spiritually - and of the dissemination of knowledge and research. *The evoca-*


LISTA DEPUTAȚILOR

CLERU
I. P. S. S. Nifon, Mitropolit
P. S. S. Kalinik, Episcopul Rămnicului
» » » Filotei, » Buzăului
» » » Climent » Argeșului

ILFOV
Printul Dimitrie Ghica, Col. Propr. mari
» Const. Gr. Ghica, » » »
Serdar Costache Bozianu, » » mici
Logofăt N. Golescu, » Capit. București
Pitar C. A. Rosetti, » » »
D-nu Vasile Boerescu » » »

R.-SĂRAT
Serdar Scarlat Fălcoianu, Col. Propr. mari
D-nu Costache Cotescu, » » mici
» C. Argintoianu, » oraș. Focșani

BRĂILA
Clucer G. Filipescu. Col. Propr. mari
D-nu C. Crețulescu, » » »
» M. Marghiloman, » » mici
Serdar Nicolae Opran, » orașului Brăila

BUZĂU
Serdar Ioan Marghiloman, Col. Propr. mari
Propr. Scarlat Voinescu, » » »
Paharnic N. M. Pacleanu, » » mici
Serdar C. Dogiu, » oraș. Buzău

PRAHOVA
Aga Ioan Canacuzen, Col. Propr. mari
» Const. I. Filipescu, » » »
Paharnic Ioan Marzea, » » mici
D-nu Ioan I. Filipescu, » orașului Ploești
Pitar Tache Grigorescu, » » »

IALOMIȚA
Logofăt Scarlat Crețulescu, Col. Propr. mari
Clucer Barbu Slătineanu, » » »
Logofăt Barbu Catargiu, » » mici
Aga Al. E. Florescu, » oraș. Călărași

DÂMBOVIȚA
Colonel I. E. Florescu, Col. Propr. mari
D-nu Ștefan Greceanu, » » »
» G. Crețeanu, » » mici

VLAȘCA
Dr. Apostol Arsache, Col. Propr. mari
Paharnic N. Tătărani, » » »
Postelnic C. Rădulescu, » » mici
Pitar Petrache Dobrescu, » orașului Giurgiu

TELEORMAN
Vornic C. Cantacuzen, Col. Propr. mari
Logofăt I. Slătineanu, » » »
Serdar C. Apostolescu, » » mici
Major Dimitrie Stolnicopolo, oraș. T.-Măgurele

MUSCEL
Paharnic Barbu Bălu, Col. Propr. mari
Căpitan Iorgu F. Lazu, » » »
Pah. Nicolae Brăilanu, » » mici
Serdar Al. Anghelescu, » oraș. Câmpulung

ARGEȘ
Comisul N. Rosetti, Col. Propr. mari
Sub-Logofăt Ion Brătianu, » » »
Serdar Scarlat Turnavitu, » » mici
D-nu Dimitrie Brătianu, » orașului Pitești

OLT
Paharnic Iorgu Văleanu, Col. Propr. mari
Colonel Ștefan Vlădoianu, » » »
Serdar I. Petrescu, » » mici
Paharnic N. Iverenu, » oraș. Slatina

ROMANAȚI
Pr. G. Bibescu Brâncoveanu, Col. Propr. mari
Serdar Stănuță Cesianu, » » »
D-nu Andrei Preșleanu, » » mici
» Costache Golescu, Col. orașului Caracal

R.-VÂLCEA
Logofăt I. Otetelișeanu, Col. Propr. mari
Clucer K. Otetelișeanu, » » »
» N. Lahovari, » » mici
Colonel Th. Brătianu, » oraș. R.-Vâlcea

DOLJU
Logofăt D. Bibescu, Col. Propr. mari
Printul Gr. Barbu Știrbei, » » »
Pitar Ion Socolescu, » » mici
Colonel I. Solomon, » oraș. Craiova

GORJIU
Colonel N. Bibescu, Col. Propr. mari
Pitar C. Săveni, » » »
Aga C. N. Brăiloiu, » » mici
Clucer Iancu Slătineanu, » oraș. T.-Jiului

MEHEDINȚI
Aga Dimitrie Filipescu, Col. Propr. mari
D-nu D. Ploeșteanu, » » »
Serdar Ion Cornățescu, » » mici
Spătar Barbu Vlădoianu, » oraș. T.-Severin

Proprietar-Editor, D. I. CERBUREANU.

Figure 13. List of the Participants. Apostolos Arsakis' name featured amongst the Vliasca representatives.

Figure 14. Vlachs seen in their traditional clothing in northern Greece in the early 20th century.

Figure 15. Farewell reception from the Greek shipowners in honour of the minister of Commercial Navy, Nicolaos Avraam, after the conclusion of the baying agreement for 100 Liberty ships. 19 Jan. 1947, New York, From: Harlaftis G., Aristotelis Onassis. The true story, p. 81.

tive juxtaposition of ancient glory and [its] resurrection by a modern descendant creates a compound fable of national resurrection in which the historical existence of neither ancient society nor its putative modern successor possesses full meaning by itself.[31,32] Consequently, in the distant background of Kottas' painting, the Acropolis and its monuments are rendered only faintly.

The benefactors were not merely offering gifts to the Greek nation; they sought to contribute in a manner that would secure the adoption of Western European values and medical practises. The extent of their success is evident in the striking transformation of Athens from a small Ottoman town into an elegant European capital (Fig 16a-d).

Figure 16. Above: The Athens Neoclassical Trilogy on Panepistimiou Str. (a: The National Library, b: The National University, c: The National Academy), opposite the Arsakeion. Below: "The Bazaar of Athens", in Edward Dodwell, Views in Greece from Drawings, London, 1821 (Digital Library of the University of Heidelberg), painted just 35 years before the erection of the neoclassical Arsakeion.

3. Language

The benefactors depicted in Kottas' painting were predominantly Vlachs. In their places of birth, the

spoken languages constituted a mixture of a local Greek dialect, Albanian, some Turkish, but primarily Vlachika (Aromanian), the mother tongue of most of the Vlach benefactors during their youth. The Aromanian language belongs to the eastern branch of the descendants of Latin and was formed in the first centuries AD following the Roman conquest of the Balkans.[33] In Greek usage, the term "Vlach" (Vlãheshte) prevailed, although the terms "*Aromanian*" and "*Koutsovlachika*" are also employed in scholarly discourse. It is one of the four Romance languages of the Balkans, with a significant proportion of vocabulary derived from Greek. The oldest known example of Vlach writing is the inscription on an icon of the Virgin Mary by the priest-monk Nektarios Terpos, dating to 1731, discovered in 1950. It originates from the Monastery of the Nativity of the Virgin Mary at Ardenitsa[34] (Fig 17a).

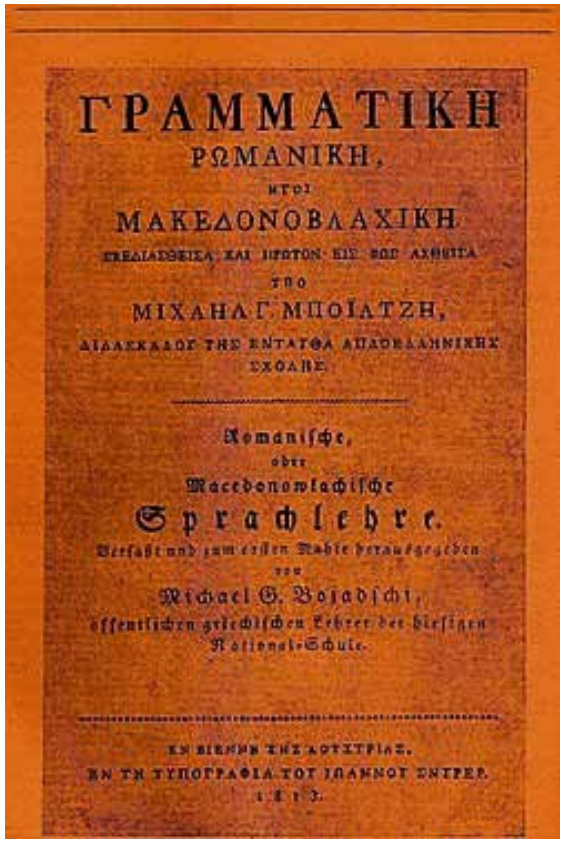
The first grammar book of the Aromanian language was published in 1813 in Vienna (Fig 17b).

However, once these Vlach boys emigrated abroad and advanced in their education, they adopted for their verbal and written communications with other Greeks an elegant, albeit somewhat artificial, form of Greek known as Katharevousa ("purified" Greek). In their dealings with non-Greeks in their new countries they spoke chiefly French, the customary language of Europe's élite. In Romania, by contrast, any hint of Vlach descent was deemed a source of humiliation. General Radu R. Rosetti noted that his father had attended secondary school in Toulouse and cherished French culture; he added that, when the brothers quarrelled, one would disdainfully call him "salle valaque" ("belonging to the Vlach department").[35]

Conclusions

The Greek benefactors depicted in Kottas' painting traversed a complex path before being fully identified as Greeks in the modern sense of the word. Similarly arduous was their journey from impoverished, illiterate Vlach boys to prominent, wealthy, and influential members of the societies to which they emigrated. Acting as distinct minorities, and possessing a *homo oeconomicus* mentality, they achieved high status, thereby transforming their cultural behaviour and identity into that of benefactors. From a sociological perspective, unlike the traditional philanthropist who provides individual assistance to the needy, the benefactor seeks to reorganise society through the establishment of institutions.[36] Hence, social advancement was reciprocal: through their donations the benefactors enhanced their own status, while society as a whole gained access to modern concepts of education and

A



B

Figure 17. a: The Virgin Mary's icon from Ardenitsa, b: A Makedon (Arman) Grammar Book, Viena 1813.

healthcare. As has been observed, "*Beneficence is not an obligation; it is an act of personal realisation, historical consciousness, and social awareness*".[37]

The two individuals on whom this study has focused - Apostolos Arsakis and Konstantinos Bellios - maintained strong connections with the field of medicine, either through their professional careers or through their donations to hospitals. Although they donated substantial sums to the Greek State for the establishment of healthcare and educational institutions, their acts of generosity were initially met with some reluctance. Both benefactors adored Greece; however, neither chose to live there. Bellios stayed in the country for only three months, while Arsakis, never visited it at all.

ΠΕΡΙΛΗΨΗ

Η κοινωνική ανέλιξη των Ελλήνων Εθνικών Ευεργετών του 19ου αιώνα. Το παράδειγμα του Αποστόλου Αρσάκη και του Κωνσταντίνου Μπέλλιου

Έφη Πουλάκου-Ρεμπελάκου, Μαρία Μάνδηλα-Κουσσουνή, Αθανάσιος Διαμαντόπουλος

Αν και ήδη από το 1894 ο Charles Mclntire περιέγραψε την ιατρική κοινωνιολογία ως την επιστήμη των κοινωνικών φαινομένων ατομικά των ίδιων των γιατρών αλλά και συνολικά ως μιας ξεχωριστής τάξης, η κοινωνική πρόοδος των ιατρών και των δωρητών των Ιδρυμάτων Υγείας ως ομάδας έχει μελετηθεί ελάχιστα. Έτσι, αναλάβαμε την παρούσα πιλοτική μελέτη. Η έρευνά μας, ξεκίνησε με έναν πίνακα που απεικονίζει μια ομάδα Ελλήνων ευεργετών κυρίως του δέκατου ένατου αιώνα και στοχεύει να παρουσιάσει τη ζωή και το έργο δύο εξ αυτών, του βαρώνου Κωνσταντίνου Μπέλλιου και του Απόστολου Αρσάκη. Και οι δύο ήσαν στενά συνδεδεμένοι με την ιατρική και τα ιατρικά ιδρύματα. Εκτός από τις βιογραφίες των δύο αυτών επιφανών ευεργετών, η μελέτη εξετάζει εκτενώς την κοινωνική διαδρομή που πραγματοποίησαν οι δύο αυτοί φτωχοί και αμόρφωτοι Βλάχοι για να εξελιχθούν σε πλούσιους, μορφωμένους, αριστοκράτες Έλληνες εθνικούς ευεργέτες.

Λέξεις Κλειδιά: *Απόστολος Αρσάκης, Κωνσταντίνος Μπέλιος, Ρουμανία, Εθνικός ευεργέτης, Αυστροουγγαρία*

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Petros Bouras-Vallianatos and Dionysios Stathakopoulos (2024), eds., Drugs in the Medieval Mediterranean Transmission and Circulation of Pharmacological Knowledge, Cambridge: Cambridge University Press

Helios Poros[1]

Abstract

This collective volume outlines the history of medieval medicine as a cross-cultural phenomenon in the Mediterranean region. The contributors adopt an interdisciplinary approach, drawing upon archaeological findings in the study, editing, and comparison of texts. The volume highlights the cultural interaction among Byzantine, Jewish, Islamicate, and Latin medical traditions. Situated within diverse contexts, Drugs in the Medieval Mediterranean reveals how pharmacy and medicine intersected with philosophy, magic, cuisine, religion, alchemy, and politics. By focusing equal attention on the linguistic and medical traditions of the texts, the authors trace and analyse the transmission of scientific knowledge and the trade in medicinal substances across the full breadth of the medieval Mediterranean.

Key Words: *Medieval pharmacology, mediterranean medicine, intercultural exchange, magic and medicine*

Drugs in the Medieval Mediterranean presents an innovative approach to history of medical literature, encompassing the major Mediterranean medical traditions of the Middle Ages. The volume explores medieval medicine through its interactions with material, communal, political, spiritual and philosophical understandings and practices. Petros Bouras-Vallianatos introduces the topics through two sections. The first section focuses on the transmission and reception of pharmacological texts; the second explores notions of medicine in magical, alchemical, superstitious, diplomatic, and self-treatment contexts. His introduction fulfils several functions - providing a measured entry into this holistic approach to the field, guiding researchers toward chapters of interest, and capturing the interest of specialists while remaining accessible to general readers.

Bouras-Vallianatos introduces a 'Mediterranean-wide view for understanding more general medieval phenomena' (p. 3). He outlines an interdiciplinary understanding of medieval Mediterranean medicine across the various medical traditions, approaching them in an egalitarian manner. The book's contributors avoid definitional reductionism by carefully setting the contextual scope for understanding 'Byzantine', 'Greek', 'Latin', 'Islamicate' and 'Jewish' witnesses, people and practices. In the first part of the introduction, the editor briefly summarises the reception of classical medical knowledge, for instance the works of Dioscorides and Galen. In the second part, he outlines how new knowledge was adopted from the Islamicate world. Introducing the first part of the volume, Bouras-Vallianatos expresses an 'urgent need for editions of unpublished and unexplored texts, as well as the importance of studying previously neglected versions/redactions of certain treatises' (p. 12). The following subsection of the introduction begins by examining surviving copies of *Ephodia tou apodēmountos* and Paul of Aegina's *Epitome*. The reader is surprised by the loss of textual and paratextual information when

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studying critical editions, such as the number of hands, the manuscript's commissioner, personal alterations/additions, and the educational context.

The introduction follows by proposing a classification of pharmacological texts, based on 'trends that marked the period under examination' (p. 14). The first class of works consists of lists of recipes and pharmacopoeias, noting *Antidotarium magnum,* the *Dynameron*, *Ricettario Fiorentino* and *al-Jāmiʿ li-mufradāt al-adwiyah wa-l-aghdhiyah (Collector of Simple Drugs and Foodstuffs)*. The second class contains an emerging type of practical manuals listing basic recipes for medical specialists in their respective places of healing (hospitals, apothecaries), noting *iatrosophia* and *xenōnika*, and the Arabic *aqrābādhīnat.* The third class contains bilingual and multilingual glossaries and translations of Arabic pharmacological works to the other prominent languages in the region. Works in this final class are full of multilingual synonyms and transliterations, thus demonstrating an intercultural transmission in medieval Mediterranean medicine. This holistic approach is furthered by arguing for the examination of archaeological evidence.

Palynological and paleopathological studies, combined with a contextual approach of pharmacological manuscripts, bear testimony to intercontinental trade of medicinal ingredients and recipes. *Boundaries of Pharmacology* introduces medieval medicine's 'entanglement with magic, religion, philosophy, cooking, alchemy, and diplomacy' (p. 21), as explored in the volume's second part. Individual recipes, and in some cases entire chapters on compound drugs and amulets, invoke planetary powers and address both supernatural afflictions - such as possession and the evil eye - and naturally occuring ailments. Byzantine healing recipes often replaced conventional treatments with Christian prayers, astrological formulas, magical symbols, and (para)religious imagery, particularly in cases such as epilepsy. The subsection of the introduction explains the empirical approach to the treatment of disease with amulets, attempting rational and magical explanations alike.

Bouras-Vallianatos proceeds to explore the use of amulets in Islamicate and Jewish literature. He showcases aspects of alchemical recipes, intertwined with medical and culinary recipes, illustrating the broader societal and cultural understanding of medicine in Byzantium. He concludes by emphasising the need for 'careful interdisciplinary research, a true dialogue of equals among specialists' (p. 26), pointing out the epistemological benefits of an egalitarian approach to the interactions of cultures and practices. To this end, he urges publishing unedited medicinal texts, paying attention to detail, as well as revisiting and reediting published work in a holistic research approach.

- Fabian Käs opens the first part of the book by investigating the works of Ibn al-Tilmīdh, a leading physician and key figure in the Nestorian community of eleventh- and twelfth-century Baghdad, having served 'several Abbasid caliphs as their personal physician'. The author dispels the widespread misconception that two surviving witnesses represent entirely separate texts, offering a comparative analysis of their differences. Through exemplary textual research, Käs explores possible explanations for these divergences and provides two helpful multilingual tables.
- In the second chapter, Doolittle undertakes an interdisciplinary study of the evolution of stomatological literature with reference to paleopathological studies. He traces how medical recipe collections evolved from treating simple ailments to addressing more complex conditions, reflecting greater medicalisation and diverse reception. This evidence indicates an increase in trade and scholarly involvement of physicians. Doolittle aptly documents his argument with the use of eight tables, qualitatively and quantitatively comparing references to Pliny's work. The author concludes with a clear, extensive appendix designed to facilitate further research.
- Chapter three delves into *De sexaginta animalibus* (On Sixty Animals), a zoological approach to medicine and magic. Walker-Meikle argues that while entries on animals bear semblance to those of other contemporary works, there is 'no resemblance in regard to content, transmission, or tradition' (p. 105). She notes the frequent use of Arabic transliterations and examines several manuscript variants, including an illustrated version. Exploring questions of authorship, she attributes the text to Ubaydallāh ibn Bukhtīshū. The chapter concludes with a comparative analysis of elephant entries across recensions, followed by a detailed index of animal references that serves as a valuable resource for researchers.
- In the following chapter, Mavroudi introduces the reader to the study of Byzantine scientific globalisation. She highlights the scarcity of pre-thirteenth-century technical manuscripts, and observes that most manuscripts were 'excerpted, paraphrased, or otherwise organised in order to be taught and practiced' (p. 132) in the late Byzantine period. The author studies the cultural "cross-contamination" (p. 135) of medical traditions through three surviving illustrated copies of Dioscorides herbal, dated between the sixth and ninth centuries. Mavroudi

thus argues for an understanding of a self-conscious, autonomous Byzantine science. The chapter includes five pictures of manuscript pages, indicative of the medical multilingualism under examination.

- Chapter five explores theriac, entertaining the compound drug's origin and the transmission of recipes in Latin and Arabic medical literature in medieval al-Shām. The authors follow the production and trade of different kinds of theriac in the cities of Jerusalem, Ashkelon and in Ayyubid Egypt. They explore cultural connotations of theriac as mentioned in Jewish religious tradition and laws, in relation to Jews in the *Land of Israel.* We encounter the term 'Muslim' twice, attributed to historical figures indirectly related to medicine. There are no mentions of the terms 'Islamicate', 'Arab(s)' or 'Islam'. Readers are left to decide whether the chapter manages to 'move past prejudices...which often valued one (medical) tradition over another' (p. 4).
- The sixth chapter, by Sivan Gottlieb, focuses on 'the Hebrew herbal', a partially edited translation from Latin into Hebrew from the enchanting 'corpus of illuminated Hebrew medical manuscripts' (p. 204). The corpus includes both original Jewish pharmacological works and translations from Latin and Arabic works. The entries demonstrate a symmetrical 'geometric, zoomorphic, or anthropomorphised' (p. 208) depiction of plant roots and uses, specific parts of each plant, methods of application and recipe instructions. Gottieb provides statistical data on the manuscript entries, noting medicinal, magical, rational, and superstitious elements and contexts. Entries include contemporary empirical elements, with some also indicating later additions of user findings, noting 'tested and proven' (p. 215). The author provides ten pictures and a detailed multilingual index.
- Introducing the second part of the volume, Richard Greenfield demonstrates the methodological pluralism of Byzantine medicine, in which 'magic, (medical) science, and orthodox Christianity...lie at opposite ends of the same continuous spectrum' (p. 251). Magic is defined as non-Christian supernatural powers, rituals and occult assumptions of nature. Using asphodel as an example, the chapter explores the many contexts in which the plant was used for medical purposes. Competing and intertwined, rational medicine, Christianised magic, Christian *materia* and symbols are applied with by ingestion, fumigation and contagion – in the form of amulets. Greenfield delves deeper into an immense variation of the combined practices' expected benefits by use of the same *materia*: socio-magical; spiritual; mental; sexual healing and protection, both by natural and supernatural means.
- Chapter eight focuses on Maimonides, a Jewish philosopher, Rabbi and physician who distinguished between contemporary perceptions of science and magic. Lieberman explores Maimonides' method, showing how he combined the Rabbinic tradition (which offered rational medical exceptions to the religious prohibition of magic) with Galenic empiricism, 'even if not prescribed by reason' (p. 282). The chapter draws attention to parallels between Jewish and Graeco-Roman medical thought, particularly via the figure of Pliny, whom Maimonides never read directly.
- Chapter nine examines the emergence of Islamicate self-treatment manuals, showcasing the multifaceted medical approaches of two books, resulting from their respective combinations of elements of medical tradition. Lewicka examines these compilations in their intercultural context of Mediterranean and Indo-Persian 'medico-pharmacological and medico-dietary' (p. 293) literature. In *Ghunyat al-labīb (I)*, Ibn al-Akfānī, dwells on dietary and self-treatment medicine from a Galenic approach, combined with with occult-magical practices rooted in empirical claims. The text fuses Quranic elements with symbols, spells, theriac and a diverse array of simple *materia*. For *Ghunyat al-labīb (II)*, Lewicka explores textual variations as a compilation of obscure sources. The author challenges our understanding of rationality in Graeco-Roman medicine by incorporating hadiths and closing prescriptions with the phrase "God willing".
- In Chapter ten, Chipman draws parallels between culinary and medical recipes in Fatimid and Mamluk Egypt. She compares 'soft' medicinal recipes to digestive snacks designed to accompany recreational alcohol consumption and finds few meaningful distinctions between the two. She identifies groups of similar recipes for 'fake' meat, suitable for fasting or medicinal use. The chapter concludes by indicating an explanation for unexpected variations in recipes between otherwise similar books.
- In the next chapter, Mateo Martelli attempts to bridge the modern and Byzantine understandings of 'Metallurgy, Pharmacology, and Cuisine'. The chapter explores overlapping 'tradition and innovation' (p. 353) in medical and alchemical recipes, sometimes attributed to biblical figures like Moses, with manuscripts indexed according to the 'shelfmark' system. Textual elements hint at the recipes' origins across medical traditions, with the author exploring alchemical, medical, astrological, and magical mate-

rial and even a recipe for *glykisma* (cake). Martelli's work on folia 274r–278v, a previously unedited 'independent codicological unit' (p. 341) serves as the finishing touch to the chapter. The full edition and English translation of this material appear here for the first time, published in the chapter's appendix.

- Chapter 12 focuses on the epistemology of medicine through the work of Albertus Magnus. Athanasios Rinotas distinguishes between practical and theoretical knowledge in Magnus' natural philosophy. Studying Ibn Sīnā drawing on Aristotelian physics and indirectly informed by of Galen, the Dominican master composed his two works *On Minerals*. Rinotas follows Magnus' pursuit to refine medical theory, combining physics with 'necromancy, astrology, and magic' (p. 374). In Magnus' understanding, celestial bodies influenced a sigil carved stone's primary qualities, thus enhancing its expression of material cause as powers having humoral effects.
- The final chapter weaves together the thematic strands of the volume by examining drug and book trade, looting, war tribute and (diplomatic) gift exchange. Durak documents the practices, de facto revolving around the Islamicate world and its neighbours in Asia, Africa and Europe. The chapter focuses on *materia* such as sugar, saffron, cinnamon, theriac, the rare mineral mūmiyāʾ and other (unidentified) mineral substances. Exploring their various refinements and medicinal, culinary and diplomatic contexts, readers are holistically presented with a picture of medicinal and world history.
- *Drugs in the Medieval Mediterranean*' pays attention to detail by comparing different editions, transmissions and paratextual elements, framed by a fresh and egalitarian approach to Mediterranean medical traditions. The volume also introduces readers to para-medical contexts and practices, where recipes and *materia* blended religious and magical epistemologies with science. The book's interdisciplinary and intercultural approach both widens the scope and deepens the insight of contemporary research. Reaching diverse audiences, *Drugs in the Medieval Mediterranean* succeeds in inspiring expert researchers while remaining accessible to the casual reader.

ΠΕΡΙΛΗΨΗ

Βιβλιοκριτική: Petros Bouras-Vallianatos and Dionysios Stathakopoulos (2024), eds., Drugs in the Medieval Mediterranean Transmission and Circulation of Pharmacological Knowledge, Cambridge: Cambridge University Press

Ήλιος Πόρος

Ο συλλογικός αυτός τόμος σκιαγραφεί την ιστορία του μεσαιωνικού φαρμάκου ως διαπολιτισμικό φαινόμενο στην περιοχή της Μεσογείου. Οι συντελεστές προσφέρουν μια διεπιστημονική προσέγγιση, αξιοποιώντας αρχαιολογικά ευρήματα στη μελέτη, στην επιμέλεια και στη σύγκριση κειμένων. Ο τόμος αναδεικνύει την πολιτισμική αλληλεπίδραση μεταξύ της Βυζαντινής, της Εβραϊκής, της Ισλαμοποιημένης και της Λατινικής ιατρικής παράδοσης. Εντός διαφορετικών συγκειμένων, το *Drugs in the Medieval Mediterranean* βρίσκει τη φαρμακευτική και την ιατρική να αλληλοεπικαλύπτονται με τη φιλοσοφία, τη μαγεία, τη μαγειρική, τη θρησκεία, την αλχημεία και την πολιτική. Αντιμετωπίζοντας ισότιμα τις γλωσσικές και τις ιατρικές παραδόσεις των κειμένων, οι συγγραφείς εντοπίζουν και μελετούν τη μετάδοση επιστημονικής γνώσης και το εμπόριο φαρμακευτικών ουσιών στο πλήρες εύρος της μεσαιωνικής Μεσογείου.

Λέξεις Κλειδιά: *Μεσαιωνική φαρμακολογία, μεσογειακή ιατρική, διαπολιτισμική ανταλλαγή, μαγεία και ιατρική*

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Obituary: Elias C. Papadimitrakopoulos

Lambros Vazaios[1]

Elias C. Papadimitrakopoulos, Retired Brigadier Military Medical Officer, passed away on 29 November 2024. He had reached a venerable age - 94 - and was among the last, if not the very last, of his generation in the field of military medicine. His final days at the Army Pension Fund Nursing Foundation (NIMTS) were difficult, yet to the end he remained lucid. Our final telephone conversation took place just two days before his passing.

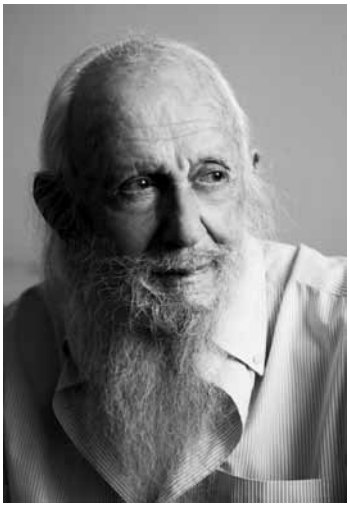

Figure: The late Elias C. Papadimitrakopoulos in his old age.

In the wake of his death, tributes poured in from colleagues, friends, the literary world and beyond. The press and digital media carried reflections on his life and work - tributes marked by a tone of restraint and dignity, just as he might have wished. Thoughtful accounts of his legacy appeared alongside concise and respectful biographical notes, free of excess.

Our acquaintance, some 45 years ago, and the friendship that since unfolded - like a finely wrought tapestry of shared emotion - remain one of the most cherished journeys of my life. In our own circle - the world of military physicians - Elias held a place quite apart. To those less familiar with him, he was simply "the writer". But to those of us who knew him well, he was the Elias who wrote, who lovingly preserved the polytonic script, who championed the hand-crafted elegance of traditional typography and the compositors' case. I shall not dwell, my friend, on the oft-repeated observation that you wrote sparingly, as if that were some rare eccentricity. It was simply your way: the deliberate, distinctive quality of your prose, which you left to us as a precious trace of your journey through life.

Many, I believe, were waiting for you on the other side. I imagine you now sharing the latest news. Synopoulos, Giorgis Pavlopoulos and Christoforos Milionis must have spotted your arrival from afar, a little impatiently. Pentzikis has likely already sketched your portrait, annotated with his trademark allusive comments. Kavvadias murmurs the final 5 lines of his poem about the Old Man who needs only two metres of sailcloth. Tsirkas and Karagatsis have fallen into a soft, familiar conversation. And there are many others with whom you once walked. I trust they will forgive me for not naming them all.

Permit me now to say a few words on behalf of myself and other colleagues - those of us who, when attempting to give voice to our sensibilities, turned to you for guidance. We approached, shyly, with awkward first drafts in hand to ask you. You were never indulgent, but nor were you distant. You spoke frankly of weaknesses, and never hesitated to question whether we were right to call ourselves writers at all. Yet in the professional sphere - in the vast arena of military life - you were well known and widely respected.

The years passed and much happened. From you we learned of Elias Petropoulos, who must surely be content that you ensured his unique archive now rests in the Gennadius Library. We explored Pentzikis with you, discovered Kahtitsis, and lit candles in quiet chapels for Papadiamantis.

With gentle Niovi always by your side, you embraced sensibility where others perceived only aversion and oppression. The years in Kavala, where you founded the local film club and introduced Buñuel, and the years in Veria, where you donated your personal library, were luminous. Under your stewardship, the Medical Review of the Armed Forces became a respected scientific journal. Tsiveriotis, the master printer, laboured with you to bring to life the journal's beautifully crafted editions.

[1]Private researcher

In retirement, you settled in Paros - a place that embraced and honoured you. Your estate became your pride and joy, the fruit of your labour and constant care. That television interview in which you spoke so openly remains unforgettable.

But inevitably, the years came when we were no longer tall and strong, no longer travelling. You stayed in Kypseli, quietly and permanently, with Niovi beside you, as we all gradually withdrew. Our long phone conversations became a source of deep pleasure - frequent and full of meaning. I miss them terribly, Elias. I miss, too, the act of sending you by post the pieces I published online. You never compromised; you refused to touch a keyboard to the end. The rest of us struck uneasy pacts with our computers. Some of us held firm against social media, insisting only on open correspondence. You never reproached us for this. The postal service was our ally; The postman in Kypseli and the Poste Restante in Naoussa, Paros, were frequent and familiar intermediaries.

And now, dear friend, it is time to say goodbye. I have not written the "fine" obituary I had intended at first. But I know you will not mind - you always liked my slightly tangled prose.

So here ends the first piece I shall not post to you—alas, the first you will never read.

Go well, fellow traveller - *errōso parodita*, as you taught us to say.

And why not simply say… Farewell!

Νεκρολογία για τον Ηλία Χ. Παπαδημητρακόπουλο, στρατιωτικό ιατρό και συγγραφέα, που έφυγε στις 29 Νοεμβρίου 2024 σε ηλικία 94 ετών.
Βαζαίος Λ.

Biographical Note

Elias C. Papadimitrakopoulos

Born: Pyrgos, Ilia – 23 August 1930

Died: Athens – 29 November 2024

Elias Ch. Papadimitrakopoulos studied at the Hellenic Military Medical School and pursued a career as an internist and public health specialist.

He made his literary debut in 1964, under a pseudonym, with the short story *"Oi Frakasánes"*. He contributed regularly to numerous literary journals and for many years served as Editor-in-Chief of the *Medical Review of the Armed Forces*.

He was a founding member of the Association of Friends of the Museum of Greek Medicine.

He retired from military service in 1983 with the rank of Senior General Medical Inspector.

His literary work is classified within the post-war generation and is distinguished by its economy of language, subtle - at times imperceptible - irony, and a tender nostalgia for the difficult years of youth shared by his generation.

He wrote for *Kathimerini* and *Eleftherotypia*, offered film criticism, and oversaw the publication of major works, including *Ulysses* by James Joyce.

Several of his works have been translated into French and English.

After his retirement, he spent most of the year at his estate on the island of Paros.

In 2007, the documentary *"A House by the Sea"*, directed by Lefteris Xanthopoulos, was filmed there and focused on his life and work.

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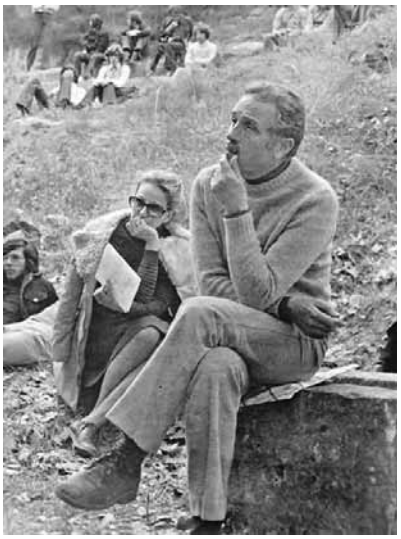
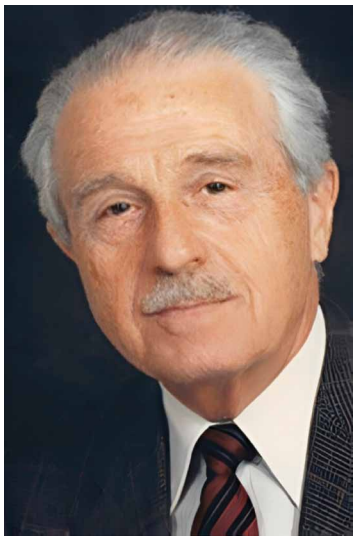
George K. Daikos (1918 – 2025): In Memoriam

George Daikos[1], George Petrikkos[1]



1973. Visiting Amphiareion with his wife Marika and his students.



George k. Daikos, MD (1918 – 2025)
Professor Emeritus, School of Medicine National and Kapodistrian University of Athens.

Abstract

Obituary for George K. Daikos, Honorary Professor of Medicine at the National and Kapodistrian University of Athens (NKUA) and former President of the International Society of Chemotherapy (ISC), who passed away on 10 June 2025, aged 106.

George K. Daikos, Honorary Professor of Medicine at the National and Kapodistrian University of Athens (NKUA) and former President of the International Society of Chemotherapy (ISC), passed away on 10 June 2025, two months before celebrating his 107th birthday.

He received his MD from NKUA in 1940. After completing his service in the Greek army and his residency in Internal Medicine, he pursued postgraduate studies in the USA (1947–1951), initially at Harvard Medical School under the renowned microbiologist Professor Sarge Cheevers, and subsequently at Hayne's Memorial under the legendary infectious disease expert Professor Louis Weinstein. Upon his return to Greece, he joined the School of Medicine faculty at NKUA as Associate Professor in the Department of Clinical Therapeutics. In 1968, he was elected Professor of Medicine and appointed Chairman of the First Department of Propaedeutic Medicine of NKUA at Laikon Hospital, a position he held until 1985. In 1985, he was awarded the title of Professor Emeritus and in 2017, the NKUA awarded him the title of Honorary Professor.

George Daikos' professional life spanned five decades in academic medicine devoted to the fields of antimicrobial chemotherapy and infectious diseases. He entered the infectious diseases arena at an excit-

[1]MD, Professor Emeritus, School of Medicine National and Kapodistrian University of Athens

ing time - the dawn of the antimicrobial era. His early research focused on the pathogenesis of rheumatic fever. He later focused on the pharmacodynamics and pharmacokinetics of penicillin, using the experimental model of subcutaneously implanted fibrin clots in rabbits. He participated in numerous Phase II and III clinical trials on new antibacterial agents. Daikos was a founding member of the International Society of Chemotherapy (Naples, 1961), serving on the Executive Committee for 20 years (1973-1993), subsequently as Vice President and finally as President (1985-1989). He was also a founding member of the Mediterranean Society of Chemotherapy (Catania, 1976), serving as President and subsequently as Honorary President for life. Daikos was Fellow Emeritus of the Infectious Disease Society of America, Honorary Fellow of the British Society of Antimicrobial Chemotherapy, and member of other International and Hellenic societies. For his contributions in the field of infections and antimicrobial therapy, he was awarded the Hamao Umezawa Award by the International Society for Chemotherapy and the ESCMID Award for Excellence in Clinical Microbiology and Infectious Diseases.

Professor Daikos is widely regarded as the "father" of antimicrobial chemotherapy and infectious diseases in Greece. He founded both the Hellenic Society of Chemotherapy and the Amphiareion Foundation. The latter has supported many young physicians through scholarships and research grants in infectious diseases. Throughout his career, he was recognised by medical students, residents and colleagues alike as a professor dedicated to education. He knew his students by their first names. Direct communication with students and getting to know them personally were goals that he pursued and achieved through continuous effort. He considered this to be a '*key*' to the best teaching results. He introduced many educational innovations in Greece, including the clinical pathology conferences (CPC), modelled after what he experienced in Boston. To improve the physical examination skills of his students, together with his group he created audiovisual material demonstrating examination techniques for each system of the body. Due to the limited number of beds at the university hospital and the large number of students, he extended teaching to hospitals of the national health service run by his former colleagues. He left nothing to chance but he used to visit his students at the host hospital to monitor their progress and talk to the teachers. A gifted clinician, leader and mentor, he possessed the charisma that inspired young physicians and, more importantly, helped people become better human beings.

Beyond medicine, he had a number of interests, particularly activities that brought him close to nature, such as hiking, skiing, swimming, and exploring archaeological sites. A lifelong admirer of Hippocratic medicine and classical *paideia*, he organised annual visits for his students to the archaeological site of the Amphiareion (a 5th-century BC sanctuary where pilgrims went to seek healing). There, students analysed selected passages from the Hippocratic Corpus, after which he led discussions providing his own commentary. These visits remain unforgettable for many generations of medical students. The importance of visiting such places was eloquently expressed by the renowned oncologist Jim Holland at the closing ceremony of the 8th International Congress of Chemotherapy at the Asklepieion in Kos, as recorded in Daikos's memoirs: *'We usually operate within the limited confines of the present, but here, in the homeland of Hippocrates, we felt the eternity of time and gained a new perspective.'*

He is survived by his devoted wife, Marika, who stood by him throughout his illustrious career. Professor George K. Daikos will be fondly remembered by patients, students, colleagues, friends, and family for his kindness, generosity, and lifelong contributions to science, education, and humanity.

ΠΕΡΙΛΗΨΗ

Εις μνήμη Γεωργίου Δαΐκου (1918-2025)

Γεώργιος Δαΐκος, Γεώργιος Πετρίκκος

Νεκρολογία για τον Γεώργιο Κ. Δαΐκο, Επίτιμο Καθηγητή Ιατρικής του Εθνικού και Καποδιστριακού Πανεπιστημίου Αθηνών (ΕΚΠΑ) και πρώην Πρόεδρο της International Society of Chemotherapy (ISC), ο οποίος απεβίωσε στις 10 Ιουνίου 2025 σε ηλικία 106 ετών.

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