

TREATMENT OF TUBERCULOSIS IN THE 17th CENTURY BASED ON THE ORIGINAL WORK *DE PHTHISI (ON TUBERCULOSIS)* FROM 1679

LIJEČENJE TUBERKULOZE U 17. STOLJEĆU NA OSNOVI IZVORNOG DJELA *DE PHTHISI (O TUBERKULOZI)* IZ 1679.

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SUMMARY

*Galen was the first who defined phthisis as lung ulceration, accompanied by coughing, persistent low-grade fevers, and body wasting. Attempts to define tuberculosis and find the cause of the disease belong to significant errors in the period of medical theories about tuberculosis (TB). Even in the 17th century, the most common causes of this disease were pulmonary ulcers, incorrect shape and position of the lungs, or menstruation. This article endeavors to elucidate the history of TB and its therapy in the 17th century on the basis of the Latin inaugural academic disputation *De phthisi (On Tuberculosis)* from 1679, which was first translated into Slovak in 2021. It was written by Matthaeus Palumbini, a Hungarian physician of Slovak origin born in Turiec County (Comitatus Thurociensis) in the Kingdom of Hungary. Although this dissertation is due to the anatomical, physiological, and clinical views of the Early Modern period, the ideas about the disease inhalation route as well as the fact that the disease transmission happens indirectly through the air, are close to existing knowledge. Similarly, the TB classification, the description of indications, climatic treatment, or princi-*

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ples of healthy lifestyle surprisingly correlate with the current medical practice. The article is supplemented by examples of the period of drug prescriptions that constituted a part of the therapy. The archival source of the original text comes from the *Digitale Sammlungen der Universitätsbibliothek Erlangen-Nürnberg*.

Keywords: tuberculosis treatment, 17th century, dissertation, Matthaëus Palumbini, prescriptions

INTRODUCTION

The present study endeavors to elucidate a variety of approaches in tuberculosis (TB) treatment and management based on the analysis of a 17th-century printed academic disputation, *De phthisi* (On Tuberculosis), written by a Hungarian scholar of Slovak origin, Matthaëus Palumbini (1652 – 1710). He came from Turiec County (*Comitatus Thurociensis*), the territory of today’s Slovakia in the Kingdom of Hungary. Following the primary and secondary studies in Hungary, he seized a chance, and as one of many Hungarian peregrines, he left his homeland to obtain a university education abroad – in his case in Germany at the University of Jena (*Salana*).¹ There he studies philosophy and theology at the Faculty of Arts (*Weszprémi*, 1778, p. 151), which served as a preparation for further higher university studies. Since the 16th century, European university education has adopted Galen’s belief that “the best physician is also a philosopher” (Galen, 1997, pp. 30-34), and the study of philosophy would make one a better scientist and medical practitioner. As a result, the studies of philosophy and medicine were closely interlinked. The study of liberal arts (*artes liberales*) provided not only philosophical, rhetorical, and argumentative education, it also enriched the knowledge of the future doctor in the field of natural history, furnishing in-depth insight into the world of plants, animals, and minerals, which subsequently gave rise to many medicines (Stolberg, 2021, p. 25).

Having successfully completed his first university studies, Palumbini returned to his homeland, where he worked as a teacher and rector of the

¹ The so-called peregrinatio academica was the education-related mobility of university students with the usual rotation of several universities throughout their studies, typical for the medieval and early-modern periods. Forasmuch as there was no continuous medical education and no permanently established university in the Kingdom of Hungary until the mid of the 17th century, many Slovak Hungarians studied abroad. Another important factor positively influencing the intensive peregrination from Slovakia was the confessional parity of its population (Roman Catholic and Lutheran denominations). While the Catholics seized a chance to pursue courses at the Jesuit universities (Vienna, Prague, Rome), the steps of the others were directed mainly to Germany to the Lutheran universities. The universities of Wittenberg and Jena were the most popular among the Lutheran peregrines from the Kingdom of Hungary (Szögi, 2017, p. 9; Kelényi, 2016, pp. 39-42). Further see: Matschinegg (2022).

school in Mošovce and later as a rector of the school in Žilina until 1674. Burdensome events in Hungary related to the persecution of the Protestants were also reflected in his fate and made him return back to the University of Jena, where he enrolled in the Faculty of Medicine. In 1679 he not only successfully defended the dissertation *De phthisi* and was awarded a Master's Degree in Medicine,² but he also definitely returned to Hungary, as evidenced by the *propemptikon*³ with an inserted chronogram: “Anno quo oLIVa feLIX a PaLVMbe In PannonIae DefertVr oras”⁴ (Vade prosperum, 1679, p.1).

According to the *Protocollum fassionum ab anno 1688 – 1695* and the *Protocollum fassionum ab anno 1695 – 1700* of the town of Žilina, Palumbini was a municipal senator in the years 1691 – 1700 and was awarded the title *Excellens doctor* (Lombardini, 1887, p. 79). However, it was medicine to which he eventually devoted his entire professional and personal life. At the end of his life, he worked as a county medical doctor in Trenčín.

TUBERCULOSIS IN A HISTORICAL CONTEXT

In the age of Antiquity, TB was well known and called *phthisis* (also *tabes* and *consumptio*). In Greek, the verb *φθίω* meant: to waste away, to wither, to languish, and the noun *φθίσις* / *φθογή* (meaning wasting disease, decrease) as well as the adjective *φθισικός* (meaning devastated, harassed) were derived from it. Thus, the term *phthisis* referred to wasting, physical decay, and atrophy (Bujalková, 2017, pp. 97-98). According to Hippocrates and Galen, among the most important symptoms of this disease could be listed “weediness and weakness of the patient” and “the most affected by the disease were people with poor physical constitution, especially those whose shoulder blades protrude like wings” (Hippocrates, *Epid.* III, 14 L; Galenos, *In Hipp. Aph. comment.* XVII B 53 K.). Pseudogalenic works defined *phthisis* as “ulceration of the lungs, chest or throat, which is accompanied by coughs, persistent low-grade fevers and body wasting caused by pus.” (Pseudo-Galenos, *Def. med.* XIX, 419 K.; *Introduct.* XIV, 744 K.; *In Hipp. Aph. comment.* XVII B 796 K.).

² During his stay in Jena over a span of 1675 – 1679, Palumbini was often a chairman of several disputes and dissertation defenses from theology and philosophy (Weszprémi, 1778, pp. 53-154; Klimeková, 2018, pp. 99-102).

³ *Propemptikon* was a poetical composition expressing wishes for a prosperous journey and well-being to a departing friend. It was typical for the period of late antiquity, and thereafter, medieval and early-modern periods.

⁴ Translated as: “In the year in which the noble olive branch is brought by pigeon to the lands of Pannonia.” The Latin name for pigeon is *palumbes*, is, m.; hence here is an allusion to Palumbini's surname.

Until the end of the 19th century, there were two major epidemiological theories on communicable diseases being debated widely in medical circles of Europe: *contagionist* theory, according to which infectious disease was believed to pass through physical contact, and *miasma* theory, according to which infectious disease was to be present in the air in the form of miasma, and thus could proliferate without any physical contact. As a result, the *miasmaticists* believed that the air, geographical as well as climatic environments are the key transmission channels of spreading infectious diseases (Spilenger, 2018, p. 76, note 180; Grundmann, 2012, p. 10; Winkle, 1997, pp. 84-89).

In 1546, an Italian physician Girolamo Fracastoro (Fracastorius)⁵ (1546, liber I, c. 3, p. 30) conceived the existence of contagion's vectors, called "*seminaria*", and it was in the epoch the microbes were not distinguished yet. Fracastorius observed that the illness, in the case of smallpox and the plague, was transmitted by direct contact among people (*contactu*), or through objects, as it happens, for example, with the garments (*fomites*).

In his work Fracastorius (1546, liber I, c. 2, p. 29) wrote: "...it seems that three different types of contagion exist. The first infects only for direct contact. The second acts in the same way, but it leaves besides tinders, and this contagion can spread out through these (tinders), as for example: the scabies, the tuberculosis, the malignant stains, and similar".

By assuming the existence of specific imperceptible seedlike entities transmitting contagious diseases, Fracastorius became the father of the theory of contagion, which was later elaborated by Robert Koch in the 19th century. Although some of Fracastorius' contemporaries agreed with his scientific discoveries and statements, due to a lack of understanding and adequate scientific resources, these remarkable ideas fell into oblivion (Coury, 1972, p. 22).

Throughout the 17th century, physicians further continued to study pathogenesis. Though Thomas Willis⁶ (Willisius, 1677, pars II., sectio I, cap. 6, p. 46) was the first to relate *tubercula* (small knots) to the causes of TB, the role of these pulmonary nodules was still underrated. It was not until the turn of the 18th and 19th centuries that the term *tuberculum* began to be associated with *phthisis* and the term *phthisis tuberculosa* was coined (Wunderlich, 1850,

⁵ Hieronymus Fracastorius, also Girolamo Fracastoro (1478 – 1553), was an Italian physician, philosopher, astronomer, and poet. The author of the outstanding work entitled "*De contagione et contagiosis morbis et curatione*" (1546).

⁶ Thomas Willisius, also Thomas Willis (1621 – 1675), was a famous English physician who played an important part in the history of anatomy, neurology, and psychiatry.

p. 446). However, efforts to find effective treatment for this disease failed. As soon as a new drug or treatment concept appeared, it was immediately announced with absolute enthusiasm and began to be used before its ineffectiveness or even harmful effect became apparent (Coury, 1972, p. 23). All conceivable treatments and prescriptions, diets, healthy lifestyle recommendations and climatic conditions were prescribed. Countless herbal, mineral and animal-based medicines, sometimes even bizarre, such as lungs or animal waste, were widely in use (Hahnemann, 1795, p. 311).⁷

Due to the many different symptoms and inconsistent course of the disease, TB was not recognized as an independent disease until the 19th century. It was first called “tuberculosis” by the German physician Johann Lukas Schönlein (Schönlein, 1832, pp. 57 and 115). A decisive turning point in the history of TB was the discovery of the TB pathogen “*Mycobacterium tuberculosis*” by Robert Koch in 1882. Although medication against TB was not found at the time, the cause of the disease was already revealed. In 1895, Wilhelm Conrad Röntgen discovered X-rays that enabled doctors to take a more accurate “picture of the lungs” of TB patients.

About twenty-five years later, the BCG vaccine was developed, followed by the antibiotic streptomycin. In the 1950s, Sir John Crofton used streptomycin with two other drugs (para-aminosalicylic acid and isoniazid), and this triple combination proved to be highly effective. Subsequently, over the next ten years, many sanatoriums were closed, and the incidence of tuberculosis dropped dramatically. TB gained new attention in non-endemic countries due to the HIV/AIDS and the SARS-CoV-2 pandemic (Casco et al., 2021, pp. 78-80; Riccardi et al., 2020, p. E9-E12).

THE DISSERTATION PRINTING DE PHTHISI BY MATHAEUS PALUMBINI

The printed academic disputation *Disputatio inauguralis De phtlisi*, defended and written by Matthaueus Palumbini in 1679, has been preserved in three different printed editions, which slightly differ from each other by the presence or absence of dedication and congratulatory poems. The existing editions can be found in the funds of the University Library of Erlangen-Nürnberg and the Niedersächsische Staats- und Universitätsbibliothek Göttingen. The subject of our research is a book copy from the University of Erlangen-Nürnberg (signature H00/DISS.A.S 1134), which is also entirely

⁷ “*Looh de pulmone vulpis*” – a thick syrup from fox lungs, “*lapides cancrorum*” – crayfish gastroliths.

accessible in full-text form (Palumbini, 2022). The first commented translation of the dissertation *De phthisi* was published in Slovak in 2021 (Palumbini, 2021).



Figure 1. The title page of Palumbini's dissertation "De phthisi".

The printed academic disputation *Disputatio inauguralis De phthisi* by Matthæus Palumbini consists of a title page, dedication, introduction, nine chapters (*caput*), and ends with seven congratulatory poems.

Prooemium: Introduction.

Chapter I: "*Phthiseos definitionem nominalem et realem exhibens*" presents the nomenclature and factual definition of TB disease.

Chapter II: "*Subjectum phthiseos tradens*" explains the nature of TB disease.

Chapter III: “*Causam immediatam et mediatam eruens*” explains the direct and indirect causes of TB disease.

Chapter IV: “*Causas mediatas remotiores naturales examinans*” examines the indirect, more distant congenital causes of TB disease.

Chapter V: “*Causas remotiores non naturales exponens*” explains more distant acquired causes of TB disease.

Chapter VI: “*Differentias phthuseos expendens*” offers the classification of TB disease.

Chapter VII: “*Signa diagnostica et prognostica colligens*” lists diagnostic and prognostic signs of TB disease.

Chapter VIII: “*Curationem perfectam subjiciens*” explains effective treatment for TB disease.

Chapter IX: “*Regimen diaetae adponit*” specifies the principles of a healthy lifestyle.

DEFINITIONS AND CAUSES OF TUBERCULOSIS, CLINICAL PICTURE OF THE DISEASE

The main aim of the article is to present and elucidate the principles of TB treatment widespread throughout the 17th century. However, before the analysis itself, it is essential to understand the early-modern concepts and pathogenesis of TB disease.

From Palumbini’s point of view, the definition of TB disease is as follows: “Lung ulceration, which is the cause of TB and the essential aspect that differs TB from other diseases, has been interpreted differently. According to the generally accepted interpretation of medical theories, tuberculosis cannot be spoken of unless lung ulceration occurs, which dries up the whole body.” There is another definition of TB in the text of the dissertation: “There is no reason why, together with the accomplished Thomas Willis, we should not define TB as the general wasting caused by the wrong shape and position of the lungs. Another reason for the TB development was taken over by early-modern period physicians from Hippocrates. He explained that: “... due to the usual blood retention during menstruation, blood passes into the chest and as a result, vascular rupture may occur. The cause of the blood transition to the chest is to be related to *κοινωνία*, i.e., a contact, close relationship between the sexual and respiratory parts, and therefore the blood from the uterus puts its way to the lungs” (Hippocrates, *Epidem.* II. 1, 6 L.). Palumbini’s

contemporary, Bonetus⁸ (1679, lib. II, § 7, observ. 36), added: “It is not at all strange if the lungs are eroded, that is, affected by erosion due to the retention of blood during menstruation and its upward flow due to virulence.” It should be noted that such definitions prevailed in most early-modern physicians and authors and belong to the most serious errors in medical theories about TB disease.

In Chapter V, “*On Acquired Causes*”, Palumbini analyzed the air quality in Upper and Lower Hungary as the cause of TB disease: “Sometimes the air trespasses against its nature when it blows too weak or too strong; the former makes thin blood, the latter thick and cloudy. In those places around the Carpathian Mountains, the air is too gentle, and due to the nitrogenous currents that this air retains, it is able and very convenient to take care of blood thinning. However, in the mining towns, which are situated in the middle zone between Upper and Lower Hungary and are rich in deposits of gold, silver, and other metals, the air is too dense as it is poisoned by dense metal fumes, antimony, mercury and arsenic fumes. These cause the blood to become cloudy, and because they are very detrimental to the lungs, they disrupt their structure.”

Further on, Palumbini also enumerated the towns whose air and mining patterns are disastrous for the whole region. He also mentions the type of infection transmission by touch: “Therefore, in Kremnica, Banská Štiavnica, Špania dolina, and neighboring places, TB disease is an endemic disaster. In these places, many more people can be considered tuberculosics – almost all the miners, whom you are scared of because they look not like human beings but rather like skeletons thrown out of their pits. This devastating disease can spread in such large numbers and in such harsh air, even through contact infection transmission. In this way, even a completely healthy person will get this terrible disease through contact and coexistence with a tuberculosic.”

It was believed that the air could also bring harm by its poor quality – humidity or cold. And moisture helped to form mucus, cold in turn rot: “Air with such properties is harmful in Lower Hungary, in those parts that lie around a lake called Balaton, where the humid air blowing through rotting places is polluted by harmful and smelly fumes. In these places, a large number of noble families have been affected by this deadly wasting typical for TB.

⁸ Theophilus Bonetus, also Théophile Bonet (1620 – 1689), was a Swiss physician, the author of the extensive work „*Sepulchretum, sive anatomia practica ex cadaveribus morbo denatis*“ (1697) on all surgical, medical, and pharmacological knowledge known at the time. Further see: Hajdu (2009).

Due to the roughness of the cold and humid air, during the year, autumn is the richest in infections.”

In addition, it was thought that food and drink could also lead to TB onset or at least accelerate it in susceptible populations. As a result, the author offered a brief characteristic of the eating habits in Hungary: “I don’t know why the Hungarians enjoy so much smoked meat, salted food, delicious and hot spices, onion, garlic, leek and mustard – each of these causes blood sharpness on its own, and I don’t think anyone can ignore this fact. But how does drinking the finest Hungarian wine contribute to TB disease? And what about drinking alcohol? We know from experience that its abuse intensified over time until TB was detected.”

Moreover, Palumbini assumed that the excessive use of thermal spa resorts, which were abundant in Hungary, could also be listed among the causes of the disease: “Some are so hot, such as the Spa in Bojnice, that they dilute the blood too much. Consequently, blood full of sharpness returns to the ulcerated lungs as the most appropriate one. Some spas, with their mineral, denser and salty evaporation mediated by the air, contribute to the lungs acquiring a tuberculosis character. These include also the Spa in Štubňa (today’s Spa in Turčianske Teplice), very smelly of sulfur minerals. Many miners-tuberculotics come to these hot springs dressed in flaxseed clothing, which becomes soiled from these minerals, in a vain search for a cure for desiccation. Finally, however, they turned desiccated in them for coughing.”

This was approached by a number of acid springs; which people use far and wide over. In susceptible people, frequent use of acidic waters was believed to accelerate TB disease. During the period spent in Bardejov,⁹ Palumbini met several noble young men of different nationalities: “These young men so often used the acidic waters to which they turned as a sanctuary of health that they accelerated TB and thus, to the great detriment of science and the best prospects for the future, fulfilled the inevitable power of their fate.”

The idea of the TB disease pathogenesis at that time was as follows: “Apparently, the lung ulcer destroys the parenchymal tissue, and the sac membranes, which are very similar to cobweb tissues, are partially thickened and partly destroyed by the amount and sharpness of the accumulated juices, so that one or more large cavities are formed from several weakened sacs.”

⁹ Bardejov is a historic town in the north-eastern part of Slovakia, well-known for its humanistic secondary school during the 16th – 17th centuries.

Regarding the contemporary clinical picture of the disease, the overall symptoms include weakness and increased fatigue, loss of appetite and weight loss, fever and night sweats. Similarly, Palumbini described that “weakening of the whole body, persistent fever and cough” are characteristics of TB disease. The most common organ symptoms of TB are cough, coughing up mucus (expectoration), coughing up blood, chest pain, and shortness of breath. Palumbini explained the mentioned this way: “A cough is caused by a purulent substance that, with its sharpness, stimulates the emptying of the lungs in order to remove what is harmful. The cough is sometimes dry and wild without sputum if the juices that adhere firmly to the membranes are sticky. Sometimes there is a cough with sputum.” According to Palumbini, the colour of the sputum could be black, white, yellow or bluish, and in appearance, “it can be greenish due to malignancy, or pure, from a well-digested substance.” Palumbini also used the terms pleurisy and empyema: “Sometimes wasting, prolonged fever and coughing arise from pus in the chest and this is called empyema; sometimes from pleurisy and this is called pleuritis; sometimes from a lung ulcer and this is called tuberculosis.”

Of the clinical symptoms, Palumbini rendered an account of an uneven pulse, difficulty breathing, sick sweating, urine initially similar to that of healthy people, later apparently oily, then diarrhea, hair loss, gray, leaden and slightly white colour of the face, the hippocratic face, feet are weakened and swollen, nails crooked. He also mentioned and described delirium and confusion behavior, especially as death approaches.

PRINCIPLES OF TUBERCULOSIS TREATMENT IN THE WORK ON TUBERCULOSIS

A summary of views on TB treatment in the early-modern period can be found in Chapters VIII and IX of the inaugural disputation *De phthisi*, and these also provide a brief insight into medical practice in the second half of the 17th century.

The TB classification in the disputation is surprisingly current even today. The author distinguishes:

- incipient TB, where the organs are not yet affected;
- culminating TB in which the lungs themselves are damaged, the flesh (body) is devoured, the bones are covered with meagreness, and the mouth does not enjoy food;

- total TB, where the whole mass of the lungs is destroyed;
- partial TB, in which only blood vessels, veins or arteries are partially eroded;
- superficial TB, in which only the surface of the lungs is destroyed by sores and blisters;
- deep TB, in which the ulcer has driven out deeper roots and penetrated into the inside of the lungs;
- confirmed TB, this is called when a pulmonary ulcer is diagnosed;
- false TB, which according to the author, is inappropriately called because it is without inflammation and ulceration of the lungs, or without spitting blood from mucus and saline juices;
- hereditary TB, which is transmitted from parents to children;
- acquired TB through personal faults due to improper lifestyle or for any other reason.

Palumbini opened the chapter on TB treatment with indications, i.e., appropriate treatment regulations applied to this disease. Accordingly, the *curative indication* was related to the disease itself, i.e., to the treatment of a pulmonary ulcer from which the cough, febricula (a mild fever), and the whole-body wasting originate. Laxatives, cough medicines that facilitate and improve coughing, temperature-reducing medicines, tonics and stimulant medicines for wasting, foods to improve digestion, and many others were prescribed.

The *preventive indication* prescribed drugs to stop the flow of saline mucus, drugs to induce vomiting, drugs to change the sharpness of juices, drugs to empty, drugs to eradicate the hereditary nature of TB, and drugs to suppress contact infection transmission.

The *vital indication* prescribed drugs to strengthen the vital spiritual principle (*archeus*) of the lungs, medium-strength drugs to stop bleeding, and foods that strengthen weakened parts of the body. Further, this indication required adequate use of attained things, i.e. those that were not given by nature. In line with this principle, the health of the body and mind should have been governed by: air, food and drink, sleep and wakefulness, movement and rest, excretion and retention, and state of mind.

Ars medica offered three tools, also called arsenals, for applying indications:

1. **Surgical arsenal:** in the field of surgery, Palumbini highlighted a method of *venaesectio* (venous drainage) as a very noble way of treatment, which had been practised since ancient medicine as a common treatment as well as a preventive method. Nowadays, no significant healing effect is attributed to it.

2. **Pharmacy arsenal:** the first-rank place belonged to the so-called *purgantia*, i.e., the laxatives. To eliminate the mucus flow, typical for TB disease, specific drugs called *errhina* were used to promote the secretion of the nasal mucosa. Another group of medicines used for TB treatment were the so-called *diaphoretica*, i.e., medicines inducing and promoting excessive perspiration and sweating. The author shared an ambivalent view that these could, however, also weaken the bodies of tuberculotics and, therefore, should only have been given in combination with humectants, which had the ability to absorb salts. Along with diaphoretics, also the so-called *diuretica*, i.e., medicines helping to rid the body of salt and water, were recommended to administer in the 17th century. It was believed that diuretics could cool the body and expel excess salts and pollutants from the body. According to Matthaeus Palumbini, the first-line medicines for TB treatment should have been the so-called *alterantia* (remedies, i.e., correcting medicine), which were credited to reduce blood sharpness. At the end of the wide arsenal of medicines used throughout the 17th century, there were the so-called *topica externa*, i.e., topical external remedies. Within this category, there belonged various incense burners. Heating and disinfection with smoke that comes into direct contact with the lungs was thought to be not only beneficial for its drying effects, but also for its embalming ability; and, thus, could contribute to the healing of a lung ulcer. Last but not least, there were also the so-called *vesicatoria*, i.e., medicines from the Spanish flies (a poisonous blister beetle – *Lytta vesicatoria*) and ferment, used to treat TB.

3. **Arsenal of diet or healthy lifestyle:** Palumbini, in his Chapter IX on the principles of a healthy lifestyle¹⁰, recommended that the air was not too warm, as the warm air could speed up the movement of blood and its dilution, and thus, weaken the body. However, too humid and cold air, which flows in Lower Hungary everywhere through swampy places, may cause obstruction and run-off of mucus. On the contrary, the mild air, which blows

¹⁰ Lifestyle/diet patterns differentiate according to three types of the so-called *spiritus* (spirits or energy forces): 1. *spiritus vitalis* – life spirit (force), *spiritus naturalis* – natural spirit (force) and *spiritus animalis* – mental spirit (force). Further see: Centre za Renaissance and Reformation Studies (2022).

about the regions around the Carpathian Mountains, is ideal for TB patients. According to the author, the population of Trenčín, Turiec, Orava, Liptov and Spiš Counties could enjoy such very healthy weather conditions, where their bodies protected from wasting would grow admirably like trees. Since these places are also very rich in balsamic herbs and pine, tuberculotics could be sent there.

As for the natural diet, meals should have been modest because the abundance of food intake may overcome the natural body heat, which was to facilitate digestion. Beneficial drinks were also recommended. However, all types of foods that were spicy, sour, salty or hardened with smoke, as well as frequent drinking of noble wine, should have been omitted. All of these were assumed to help sharpen the blood.

In a mental diet, abrupt exercise and excessive calm should have been avoided. But, neither too much sleep nor too much wakefulness is beneficial. However, more sleep was recommended to keep the body moist. TB patients were advised to avoid anger, quarrels, sadness, grief, and hatred. In this way, a healthy lifestyle would be successfully introduced, tuberculotics would live a long time, and in the autumn of life they could enjoy a productive old age.

MEDICAL PRESCRIPTIONS AS PART OF THE TREATMENT OF TUBERCULOSIS

The history of medical prescription writing is rather blurred, and it is very difficult to determine the exact date of the written medical prescription. German researchers (Avci et al., 2020, pp. 78-85) dealing with the history of medical prescriptions have distinguished three transformation phases that define changes in the prescription form standards. The first – crucial for our interest – phase indicated the period during which the transition from oral to written medical prescription had occurred. The written form of the medical prescription can be dated to the midst of the 13th century when the *Edict of Salerno* was issued by Frederick II, the Holy Roman Emperor.¹¹ The development of the prescription took on the following contours: “While a medieval physician initially gave the pharmacist oral instructions for the preparation of medicines, he later wrote them down in a prescription book, which was displayed

¹¹ *Edict of Salerno*, also called *Constitution of Salerno* (1241) – the first legally fixed separation of the occupations of physician and apothecary. Physicians were not allowed to own or participate in the pharmacy, and finally, the prices for various kinds of medicines were regulated by law.

in the pharmacy. The tradition of the prescription book probably continued up to the 17th century, while the (separate) written prescription given to the recipient was used in parallel with this tradition from the 16th century.” (Avci et al., 2020, p. 80).

In prescriptions, the physician and pharmacist communicated through established pharmaceutical abbreviations; these are actually the physician’s instructions for the preparation and use of the medicine, including the labeling of the prepared medicine and instructions for its dosing. In the 17th century, there were binding rules for pharmacists in Germany, where Palumbini studied, as stated, for instance, in *Laws for Pharmacists in the city of Ulm* (Netzel, 2012, pp. 493-494). Among other things, pharmacists were instructed to master Latin “*redlich und geschickt*” (properly and deftly) and to follow the so-called *pharmacopoeia (dispensatorium)* – a legally binding collection of standards and quality specifications for medicines, including regulations on their preparation and composition. The use of “pharmaceutical Latin” proved to be practical and safe as the lay population did not understand it, which prevented unauthorized medicine manufacturing. Abbreviations and symbols were also used for this purpose, in addition to their shortening of the original long prescription forms. Besides pharmacy abbreviations, the occurrence of designations for apothecary weights and measures, as well as alchemical symbols for natural substances, metals, minerals, and their compounds was frequent in the early-modern period.

Table 1. A brief overview of apothecary weights and measures was used in prescription writing and drug preparation in 17th-century pharmacies (Meyers kleines Konversationslexikon, 1908, p. 299).

1 pound ℔ (360 grams) = 12 ounces	m. = <i>manipulus</i> – a handfull
1 ounce ℥ (30 grams) = 8 drachms	p. = <i>pugillus</i> – a little handfull
1 drachm ʒ (3.75 grams) = 3 scruples	β = <i>semi-</i> – half
1 scruple ʒ (1.25 grams) = 20 grains	s./ss. = <i>semi-</i> – half
1 grain g./gr. (0.06 grams); 16 grains = 1 gram	

Table 2. A brief overview of pharmacy abbreviations used in prescriptions in the 17th century.

<p>R. (Rp.) = recipe – take n. = numero – in the number of q. s. = quantum satis – as much as suffices a. = ana – of each s. q. = sufficiente quantitate – in sufficient quantity gutt. = gutta / guttae – drop / drops coq. = coque – boil! i. / j. = unus, a, um – one ij. = duo, ae, o – two iiij. = tres, ia – three iv. = quattuor – four v. = quinque – five vj. = sex – six vij. = septem – seven semin. = semen, inis, n. – seed concis. = concisus, a, um – cut up/off contus. = contusus, a, um – pound to pieces, powder g. m. = grosso modo – in a coarse way, roughly, approximately</p>	<p>add. = adde – add! t. = tinctura – tincture l. a. = lege artis – according to / complying with the law (of pharmacy) M. f. = misce fiat – mix up to form / make D. = da – give! S. = signa – signa! colat. = colatur – have it strained / filtrate praep. = praeparatus, a, um – prepared, made disp. = dispensatus, a, um – dispensed recent. = recenter – freshly par. = pariter – equally expert. = expertus, a, um – well-proved, tested chart. = charta – paper wrapping comm. = communis – common, ordinary rad. = radix – root dissolv. = dissolvitur – be dissolved herb. = herba – haulm, grass flor. = flos, oris, m. – flower, blossom</p>
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Table 3. A brief overview of alchemy symbols for natural substances, metals, minerals, and their compounds in prescriptions and planetary symbols in the text of the dissertation.

<p>☐ = tartarum – tartar ♂ = antimonium – antimony ♁ = sulphur – brimstone, sulfur ⊖ = sal – salt ▽ = terra – earth, ground</p>	<p>☉_{SP} = spiritus – alcohol, spirit ∇ = aqua – water ♂ = oleum – oil ☿ = hydrargyrum – mercury ♋ = cancer – crayfish</p>	<p>♀ – Venus (also a symbol for copper in alchemy) ♂ – Mars (also a symbol for iron in alchemy)) ♄ – Saturn (also a symbol for lead in alchemy)</p>
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In the following part, several 17th-century medical prescriptions are presented to illustrate the form and structure of the early-modern period medical prescriptions for TB treatment with the comprehensive drug composition. The original prescription structure in the transcribed form has been preserved, accompanied by the parallel translation into English.

1. *Purgantia* (Purgative drugs)

R.	Take
spec[ierum] diagalap[ii]	Marvel of Peru tea mixture according
Mynsicht[i] g[rana] xviii.	to Mynsicht eighteen grains, four
resin[osae] scamm[oniae] g[rana] iv,	grains of scammony, one drop of anise
? [olei] anis[i] g[u]t[tam] j.	oil.
M[isce] f[iat] Pulvis purgans.	Mix up to form a purgative powder.

2. *Specifica* (Specific drugs)

R.	Take
Antihect[ici] Poterii,	Poter's powder against TB, ¹²
mag[isterii] anod[yni] Rolf[incii]	Rolfinck magistry ¹³ against pain ¹⁴
a[na] g[rana] x.	ten grains each, one drachm of
succin[i] praep[arati] albi ʒj,	prepared white amber, sublimed sulfur
flor[um] ?[sulphu]ris ʒj.	(sulfur flowers) one scruple.
M[isce] fiat pulvis pro duabus dosibus.	Mix up to form a two-dose powder.

3. *Diaphoretica* (Diaphoretic drugs)

R.	Take
? [aqu]ae fum[ariae] hyssop[i],	hyssop, fumitory water, fennel half
foenicul[i] a [na] ʒβ.	an ounce each, simple theriaca ¹⁵ half
theriac[ae] simplic[is] ʒβ, laud[ani]	a scruple, laudanum two grains, half
opiat[ici] gr[ana] ij.	a scruple of common poppy seed syrup.
sirup[i] papav[eris] errat[ici] ʒβ.	Mix up to prepare according to the law.
M[isce] f[iat] l[ege] a[rtis].	A small dose of liquid medicine for
Potiuncula sudorifera.	sweating.

¹² Lat. *Antihecticum Poterii* – in the early-modern period, it was a highly celebrated chemical preparation for use in hectic disorders – in high-grade fever as a symptom of advanced pulmonary tuberculosis.

¹³ Lat. *Magisterium* – a magistry / magistral; an agency or substance, as in alchemy, to which faculties of healing and transformation are ascribed.

¹⁴ Lat. *Anodynon* – an anodyne; a drug used to lessen pain. It contained a mixture of different herbs and opiates.

¹⁵ Lat. *Theriaca* – theriaca / theriac; it was allegedly invented by Andromachos, Nero's personal physician, and originally consisted of more than 60 ingredients; universal medicine and the famous elixir.

4. *Diuretica* (Diuretic drugs)

R.
Lapid[um] ?[cancrorum]
praep[aratorum], ? salis genist[ae]
a[na] ʒj.
trochisc[orum] de alkekeng[o] cum
op[io] ʒj.
Misce fiat pulvis. Da in charta pro
tribus dosibus.

Take
Prepared crayfish gastroliths,¹⁶ dyer's
greenweed salt, one scruple each,
lozenges from bladder cherry with
opium one drachm.
Mix up to make powder. Put in a
three-dose paper wrapping.

5. *Alterantia* (“Correcting” drugs)

R.
looh de pulm[one] vulp[is], san[um]
et expert[um] a[na] ʒiʒ.
Cons[ervae] rosar[um], herb[ae]
costae a[na] ʒij.
Antihect[ici] Poterii ʒʒ.
Pulv[eris] Haly contra Phthis[in]
recent[er] dispens[ati] ʒj.
laud[ani] opiat[ici] gr[anum] j.,
sirup[i] de rosis sicc[is] q[uantum]
s[atis].
M[isce] f[iat] l[ege] a[rtis].
Looh. D[a].

Take
thick syrup¹⁷ from the fox-lungs,
healing and tested lollipop one and a
half ounces each.
Confection of roses, trommsdorffia
maculate, two ounces each Poter's
powder against TB half a drachm.
One drachm of freshly dispensed
Haly's powder against TB¹⁸,
one grain of laudanum, syrup from
dried roses as much as suffices.
Mix up to prepare according to the
law. Thick syrup. Dispense.

¹⁶ Lat. *Lapides cancrorum* – crayfish gastroliths, literally crayfish stomach stones. These particular “stones” have actually come from inside the stomach of a freshwater crayfish and actually represent a remarkable physiological process to conserve calcium. Another synonymous term for crayfish gastroliths was “crayfish eyes” (lat. *Calculi, Lapides, Oculi Cancrorum*) and were used in traditional medicine for their absorbent properties as well as treating a number of disorders including the plague, bladder stones, convulsions, vomiting of blood and others. Further see: Bujalková & Malinová (2021), Bujalková et al. (2021).

¹⁷ Lat. *looh* – alternatively *loch*, *looch*, *lohoch*; a term borrowed from Arabic, and its original meaning was “to lick”. In medieval and early-modern Latin medical terminology, the term referred to the form of the drug: thick syrup/lollipop for cough and respiratory problems.

¹⁸ Lat. *Pulvis Haly Abbatis* – a powder made from poppy seeds, gum arabic and tragacanth, wheat flour, liquorice, and other seeds according to the recipe of the famous Persian physician of the 10th century Ali ibn Abbas al-Majusi, known in Europe as Haly Abbas. This powder was compressed into tablets, which were used to alleviate lung diseases. Further see: *Medicine traditions* (2022).

CONCLUSION

The comprehensive examination of Palumbini's dissertation work "De phthisi" has revealed many engrossing facts and details on the history of the disease, scientific thinking, and medical and pharmacological practice in the second half of the 17th century. Our research has confirmed the persistent position of the ancient principles of humoral pathology among 17th-century European physicians. According to this theory, any disease is the result of the imbalanced proportion of the four cardinal fluids in the body. This belief was reflected in the medical practice in the 17th century and offered a whole host of therapeutic procedures and medications also concerning TB disease management. From the contemporary point of view, most of them are far outdated, even bizarre. Even though the anatomical and clinical picture of TB treatment has undergone a significant developmental leap since then, some information, such as TB classification, climatic treatment, or principles of a healthy lifestyle, surprisingly correlates with the current medical knowledge about TB. As a result, the dissertation work "De phthisi" has shown to be significant not only from a historical but also from a professional point of view.

Conflicts of interest

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SAŽETAK

Galen je prvi definirao *phthisis* (*ftizu*) kao ulceraciju pluća popraćenu kašljem, dugotrajnom niskom temperaturom i iscrpljenošću organizma. Pokušaji definiranja tuberkuloze i utvrđivanja uzroka bolesti spadaju u značajne pogreške u razdoblju medicinskih teorija o tuberkulozi (TBC). Još u 17. stoljeću najčešći uzroci ove bolesti bili su plućni apsces, nepravilan oblik i položaj pluća ili menstruacija. U ovom članku nastoji se rasvijetliti povijest tuberkuloze i njezine terapije u 17. stoljeću na temelju latinske inauguracijske akademske rasprave *De phthisi* (O tuberkulozi) iz 1679., koja je prvi put prevedena na slovački 2021. Napisao ju je Matthaues Palumbini, mađarski liječnik slovačkog podrijetla rođen u županiji Turiec (Comitatus Thurociensis) u Kraljevini Ugarskoj. Iako je ova disertacija nastala zbog anatomskih, fizioloških i kliničkih pogleda ranoga novog vijeka, ideje o inhalacijskom putu bolesti kao i činjenica da se bolest prenosi neizravno zrakom, bliske su postojećim spoznajama. Slično tome, klasifikacija TBC-a, opis indikacija, klimatsko liječenje ili načela zdravog načina života iznenađujuće koreliraju s trenutačnom medicinskom praksom. Članak je dopunjen primjerima razdoblja propisivanja lijekova koji su činili dio terapije. Arhivski izvor originalnog teksta potječe iz *Digitale Sammlungender Universitäts bibliothek Erlangen-Nürnberg*.

Ključne riječi: liječenje tuberkuloze, 17. stoljeće, disertacija, Matthaues Palumbini, liječnički recepti