THE MEDICINAL USE AND COMMODIFICATION OF LEECHES IN THE LATE OTTOMAN EMPIRE

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THE MEDICINAL USE AND COMMODIFICATION OF LEECHES IN THE LATE OTTOMAN EMPIRE

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Thesis Abstract

Yasemin Baran, “The Medicinal Use and Commodification of Leeches in the Late Ottoman Empire”

This thesis examines more than three hundred trade related leech documents found among the nineteenth century Ottoman archives. These documents aggregate roughly between 1840 and 1870 and are filed in various important archival series, dealing with foreign affairs, internal affairs, correspondence among top governmental offices, imperial decrees, harem decrees and treasury accounts. This thesis is an effort to understand and give meaning to the significant stock of documents related to leeches, to their sudden increase and almost abrupt decrease between 1840s and 1870s and to the high importance that leeches were ascribed by the Ottoman government and foreign parties as reflected from the documents.

In the first part the general history of medicinal leeches has been covered with a special emphasis on the nineteenth century. In the second part the history of medicinal leeches in the Ottoman Empire has been examined with a comparative approach and also with a special emphasis on the nineteenth century. In order to understand the medicinal utilization of leeches in the Ottoman Empire some primary medical sources, medical manuscripts, archival documents and nineteenth century periodicals have been used. The fourth part is an attempt to construct the life Artouse, of a French leech merchant living in Maraş during 1850s by integrating some memoirs, articles and documents which seemed to complement each other into a meaningful and consistent whole. In the last part, the nineteenth century archival material related to leech trade has been analyzed in order to understand the value of the leech as a commodity.

As a conclusion this thesis attempts to answer the initial questions raised in the introduction part, by integrating the arguments concluded in the first four parts of the thesis with an effort to make a connection between medical, social and financial histories.

Tez Özeti

Yasemin Baran, "Geç Dönem Osmanlı İmparatorluğunda Sülüğün Tıbbi Kullanımı ve Metalaşması"

Bu tez Osmanlı Başbakanlık Arşivlerinde yaklaşık 1840 ve 1870 yılları arasında kümelenen, Hatt-ı- Hümayun, Divan Kalemi Defterleri, Mühimme Defterleri, Sadaret Mektubi Kalemi, Maliye Defterleri, Hariciye Nezareti Tercüme Odası Evrakı, Hazine-i Hassa İradeleri gibi çeşitli ve önemli fonların içinde yer alan ve yoğun bir uluslar arası ticarete işaret eden üç yüzden fazla tıbbi sülük belgesini araştırmaktadır. Bu belgelerin sayıca neden bu kadar çok olduğu, neden bu kadar önemli fonlarda yer aldığı, neden belirli yıllar arasına kümelendiği, neden bu kadar yoğun bir uluslar arası ilgi gördüğü tezin cevaplamaya çalıştığı temel sorulardır.

Bu soruları cevaplamak için ilk bölümde sülüğün neredeyse bir sülük kültürü oluşturacak kadar uzun ve zengin olan tıbbi ve sosyal tarihi özellikle on dokuzuncu yüzyılın üzerinde durularak incelendi. İkinci bölümde ise Osmanlı İmparatorluğunda tıbbi sülüğün tarihi birinci bölümdeki genel tarihle kıyaslamalı olarak ele alındı. Bu bölümde sülüğün Osmanlı tıbbında ne mana ifade ettiğinin anlaşılması için birincil tıbbi kaynaklar, yazmalar, arşiv belgeleri, anılar ve bazı dergi makaleleri incelendi. Dördüncü bölümde ise birkaç değişik belgenin şaşırtıcı bir bütünlük oluşturmasından yararlanılarak 1850'lerde Maraş'ta sülük ticareti yapan Artouse isimli Fransız bir tüccarın hayatını yansıtılmaya çalışıldı. Son bölümde ise Başbakanlık Osmanlı Arşivlerinde bulunan sülük ticareti belgelerinden yola çıkarak sülüğün bir ticaret kalemi olarak önemi ve değeri araştırıldı.

Sonuç bölümünde ise ilk başta yola çıkılan sorular bu dört bölümden elde edilen verilerin karşılaştırılması ve tıbbi, sosyal ve ticari tarih arasında bağlantı oluşturma çabasıyla cevaplandırılmaya çalışılmıştır.

CONTENTS

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CHAPTER I

INTRODUCTION

It was a surprise to find more than four hundred documents from nineteenth century related to leech trade among the archives of the Ottoman Empire. The documents begin to appear to in early 1840s and continue till the early beginnings of the twentieth century. However a closer look reveals a dense aggregation of these documents between 1840 and 1870 after which their number is reduced to a handful. Documents about leeches were found in various important official files, dealing with foreign affairs, internal affairs, *sadaret* correspondence, imperial decrees, accounts of treasury and imperial harem decrees. These documents reveal a highly busy international trafficking mostly with Austrian, English and French traders and embassies. This very time specific aggregation of documents reflecting such an intense foreign interest, the description of leech fishery as the most important source of income of the treasury in some documents signaled a larger history than a simple instrument of folk medicine would reflect.

This thesis is an effort to understand and give meaning to the significant stock of the documents related to leeches and their sudden increase and almost abrupt decrease between 1840s and 1870s. In order to be able to make sense of the financial core, my research swiftly led me to the medical adventure of leeches which go far back in history to ancient times. The natural flow of the research rendered my thesis to be constructed of three parts.

The first part can be defined as the larger history of leeches with a concern to show that these annelids, commonly regarded as medical backwardness and identified with folkloric and superstitious medicine today, had been employed as one

of the pillars of scientific and academic medicine between approximately fifth century B.C and 1850 AD.

Medicinal utilization of leeches was adopted by the core medical theory of humoral pathology which is generally regarded as the first scientific formulation and systematization of medical understanding. Leeches were applied as organic devices of bloodletting procedure which constitutes one of the fundamental therapies of humoral theory. Therefore if we are to follow the trail of the leech in the realm of the high medicine, the right path is the humoral pathology theory and bloodletting as one of its major tools of therapy.

Humoral pathology displayed an extensive subsistence till the nineteenth century possibly due to its all embracing philosophy which attempts to relate microcosmos to macrocosmos and to cover human machinery from pathology to psychology, in its entirety. Therefore, in a way, following the history of leeches also meant following a particular culture as humoral understanding made various inroads into literature, art, music as well as into social life and the daily routines.

The trail leeches left behind even after the decline of humoral pathology is clearly traceable as the annelids never completely fell from the grace of medical science and were always somehow integrated into the shifting modernity of medical history. This long history of leeches as a legitimate and popular “materia medica” is crucial as it laid the foundations for the leech craze of the nineteenth century.

After covering the medical viability of leech till the early nineteenth century, the first part of the thesis will then concentrate on the theories of the French doctor Broussais which turned leeches from a “materia medica” into a rare commodity in

Europe and will end with the fall of leech from the grace of high medicine and science due to the rise of microbiology.

The second part of the thesis concentrates on the medical adventure of leeches in the Ottoman Empire comparing their medicinal utilization with the larger history covered in the first part of the thesis. Without this relativity it would have been impossible to make sense of the changes in the philosophy and the practice of Ottoman medicine and the status of leeches as they were regarded in Ottoman scientific medicine. This part however was more difficult to examine as Ottoman medical history begs for more research and as sources like letters and memoirs which reveal the patient/doctor perspective of the medical history are scarce. Through the lens of medicinal leeches, the second part is also inevitably a story of the Empire's gradual turn from the Arabo- Persian medical heritage to Western medicine. The focus of the second part will also centre on the nineteenth century when the leech had its major impact on the Ottoman realm as a "*dernier cri*" of the Western medical practice, a craze that emerged right out of the Parisian hospitals.

The third part is an analysis of the documents related to leeches in the Ottoman archives with a concern to understand if they really can be regarded as an outcome, a financial reflection of the interaction/ intersection of the two medical curves covered in the first and second parts of the thesis. Can we really interpret this particular and time specific aggregation of leech documents as a financial wave created and ended by the impact of a specific western induced medical theory? The commodity facet of the "materia medica" has an important story to tell which is in fact much larger than the limited scope of this thesis. To be able to understand the leech demand and its decrease, a short overview of tax farming and trade monopolies will be covered with special emphasis on the tension between the "Sublime Porte"

and the involved foreign countries and the tension between the “New Order” Tanzimat and Balta Limanı Treaty.

The above concerns being the fundamental scope of this thesis, it is inevitable not to reflect a larger and wider history with a subject matter that has its origins back in the fourth century B.C. What makes these annelids interesting; apart from their intriguing biological particularity is their deep penetration into the daily human life until the middle of nineteenth century, almost to the point of acting as a mirror from which another angle of social and intellectual history emanating from the core issues of health and medicine reflect back. Following the trace of leeches turns out to be nothing less than following the major shifts in medical philosophy which is in connection and interaction with the shifting zeitgeist of the time. The understanding of body and health, the conception of illness and medicine is almost a part of a collective introspection, and a clue to the general sense that humans made out of themselves in relation to society and cosmos at a given period of time. It is no coincidence that the bloodletting calendars with astrological associations became a vogue in Renaissance or that the tension and interaction between Christianity, Neo-Platonism and Hermetic texts found a medical materialization in Paracelsian understanding, just as they found esthetical forms in the paintings and architecture of the time. It is no coincidence that the nineteenth century medicine insisted on the individuality and uniqueness of disease as opposed to the earlier medical view that grouped different diseases together in classificatory tables based on their essential similarities. Therefore this thesis will also try to include bits and pieces of social and intellectual history wherever leeches touch upon them, trying to understand the changing medical philosophies and practices in relation to their time and historical contexts.

It is also important here to clarify the use of the terms “modern medicine” and “pre-modern medicine” in this thesis. Throughout my research I came across to roughly four classifications of the concept of “pre- modern” in medicine. The first can be considered as the effort to integrate the medical phenomena into a larger scale cosmological “weltanschauung” and into a universal moral system as opposed to modern medicine that does not concern itself with this grand framework. The breakpoint of this approach is roughly the seventeenth century.

The second approach can be regarded as more functional as it traces the modernity of medicine in terms of its ability to solve practical medical problems and in terms of its impact on human survival rates. The breakpoint of this approach is roughly the second half of nineteenth century.

The Foucauldian approach relates modernity to rise of modern hospitals as an extension of the state’s machinery of control over its subjects through a monopoly of their bodies. Finally modernity can be used to define the perception with which the new medical theories were conceived by the contemporaries of a certain period. For example “*Tıbb-ı Jadid*” may not look modern to posterior eyes, but it certainly was regarded as new and modern by its contemporaries.

While not regarding these approaches as mutually exclusive and regarding them as helpful tools enabling to see the different angles of a complicated whole ,this thesis will concentrate on the functional definition of modernity and the perception of modernity as conceived by the contemporaries of a given period or theory.

CHAPTER II

THE GENERAL HISTORY OF MEDICINAL LEECHES

Pre-Modern Medicine

> Within the infant rind of this weak flower, poison hath residence and medicine power.
>
> Shakespeare, Romeo and Juliet, Act II, Scene III
>
> The Philosophy is the mother to medicine in scientific respect and the growth of one proceeds with the increment of the other in an inseparable connectivity.[1]
>
> Kurt Sprengel

Medicine today is a complex and giant amalgamation of highly specialized institutions, sophisticated knowledge, impenetrable terminology, high-tech machinery and intricate practice. Health services are increasingly becoming globally integrated enterprises and high- profile assets of finance capitalism.

This overwhelming transformation, however, took place only very recently. For a very long period of its history, medicine was much simpler in every aspect and continuities rather than changes persisted over the centuries. Some medical historians take the classical times up to and including the eighteenth century as a whole period in terms of abounding continuities. [2]

It is also important to note here that medicine for most of its history, was not the independent discipline that it is today in the modern world. A world relatively less sufficient and helpless in the face of the natural phenomena needed to mobilize

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[1] Joseph Schumacher, *Antike Medizin Vol. I,* (Berlin:Walter de Gruyter & Co., 1963) , p.viii. "Die Philosophie ist die Mutter der Medizin in Wisseschaftlichen Rückzicht und das Wachstum der einen steht mit der Zunahme der anderen Wissenschaft in unzertrennlicher Verbildung."

[2] Wear, Andrew, ed. *Medicine in Society*: *Historical Essays*, (Cambridge: Cambridge University Press, 1992), p. 2.

all its limited resources to cope with illness and death. Hence, for a long time, the stems and branches of medicine, science, religion, folklore, astrology, magic, alchemy and especially philosophy remained intertwined.

Until the second half of the nineteenth century, when medicine increasingly became an independent discipline and began to make large scale differences in human survival rates; it generally caused more harm than good. The mutuality of the art of medicine and death was reflected in the Greek word 'pharmakos' which meant both remedy and poison at the same time.[3] The idea that death and doctors were the flip sides of the same coin loomed large in history and is also expressed in the rather morbid quotation of Bernard Shaw, "The doctor's reputation stands, like an African king's palace, on a foundation of dead bodies".[4]

Deficient and erroneous theoretical knowledge was most of the time accompanied by inefficient and aggressive therapies that led to the demise of the patient even if the illness that prompted them was not lethal. Herbs, diets, purges, enema and bloodletting remained the therapeutic staples of medicine, occasionally interfered by wonder treatments like mercury (calomel) and tobacco.[5]

Dorothy Porter and Roy Porter, in their book, 'Patient's Progress', which examines doctors and doctoring in the eighteenth century England, describe a world where disease impended suddenly on individuals, households or villages without meeting much resistance and where it was common knowledge that there was not

[3] Roy Porter, *Greatest Benefit to Mankind*, (New York: W.W Norton, 1997), p. 4.

[4] Liakat Ali Parapia, "History of Bloodletting by Phlebotomy," *British Journal of Haematology*, 143, 490-495, (2008), pp.495

[5] Roy Porter, *The Cambridge History of Medicine*, (Cambridge: Cambridge University Press), 2006, p. 109.

much to be done 'to tip the balance between life and death' once an infant had a severe bout of diarrhea or a teenager developed smallpox.[6]

The meager position of medicine continued well into the late modern period as best demonstrated by the lugubrious life of the Hungarian obstetrician Semmelweis (1818-1865) who had been dismissed from the Vienna hospital and was ridiculed by the medical intelligentsia as he most persistently insisted that doctors should wash and disinfect their hands with chloride solution prior to contact with the patient, especially if they were freshly out of their cadaver sessions. [7] However, he failed to prove his assumption that doctors carried 'putrefied cadaver particles' in their hands.

As the case of Semmelweiss indicates, until the middle of the nineteenth century, western medicine and medicine in general tried to explain and cure illness without any knowledge of the smallest, yet the most operative variable, microbes. The system of medical thinking was forever changed by the germ theory which was introduced by Pasteur (1822-1895) around 1860s and improved by Koch (1843-1910) around the 1890s[8]. Only then did it become known to the world that illness was stemming from external sub-visionary, bug-like organisms rather than some vague internal imbalances. This, in turn, rendered the major therapeutic tools of the pre-modern medicine; including bloodletting and leech therapy irrelevant if not hazardous.

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[6] Dorothy Porter and Roy Porter, *Patient's Progress*: *Doctors and Doctoring in eighteenth- century England, (*California: Stanford University Press),1989, p.6.

[7] John G. Simmons, *Doctors and Discoveries: Lives that created today's Medicine,*(Chicago:Houghton Mifflin Harcourt, 2002), p. 165.

[8] Paul de Kruif, *Microbe Hunters*, (New York: Harcourt Brace& Company, 1996), p. 54-140.

Bloodletting and Medicinal Leech

> Lord Byron on his deathbed absolutely refused bleeding and application of leeches...saying that "he knew well that the lancet had killed more people than the lance". However he had to give in, exclaiming 'Come as u are, I see a damned set of butchers, take away as much blood u will but have done with it'.[9]

Some archaeologists date the earliest use of bloodletting back to the Stone Age[10] and its demise is usually placed somewhere around the middle of the nineteenth century although the practice lingered on in a waning mode until the early twentieth century. Bloodletting is accepted as being in the 'heroic medicine' category: a twentieth century term to denote that the therapy could make people suffer, become weak and die even if the illness that triggered it was not lethal. The modern perspective acknowledges that bloodletting could have been beneficial in a few specific cases like dropsy, high blood tension or iron overload, but more likely the patient was in danger of developing severe anemia or infection which would have been more than common if we remind ourselves that sanitation and antiseptics were inventions of the latter mid- nineteenth century. The patient was even in danger of dying from dehydration as for a long time the doctors believed the average amount of blood in the body to be two times of its actual total.[11] Avicenna believed he could safely tap off 20 lb.[12] and most doctors believed in bleeding their patients to

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[9]Iain Bamfort, *The Body in the Library*: *A Literary Anthology of Modern Medicine*, (New-York: Verso, 2003), p.388.

[10] Hermann S. Glasscheib, *The March of Medicine*, (New-York: G. P. Putnam's Sons, 1964), p.5.

[11] NG Schneeberg, " A Twenty-First Century Perspective," *Trans Stud Coll Physicians Phila*. , 158-85, (2002 Dec 24), pp. 173.

[12] 20 lb is approximately 7.4 liters and a body of average weight contains about 5-6 liters of blood.

"syncope", a medical term referring to the state of unconsciousness resulting from insufficient flow of blood to the brain.[13]

Bloodletting had four methods of implementation: Phlebotomy (venesection), scarification, cupping and leeching. The withdrawal of blood from a large vein or artery so as to reduce the general mass of blood is 'general bloodletting' whereas the extraction of blood from capillaries by leeching, scarification or cupping causes 'local bloodletting'.[14] Phlebotomy originates from the Greek word *phlebotomia,* which is a combination of the words *phlebs* (phlebes pl.) meaning vein and *tomia* which denotes the act of cutting or puncturing[15]. It is important to note here that the early use of the word was devoid of the anatomical distinction of veins, capillaries and arteries.[16] The Latin term venesection is used interchangeably with its Greek counterpart phlebotomy. Scarification refers to a more superficial cutting of the skin, which lets out less blood. Wet cupping is the application of a cup, after the absorption of the oxygen within, on the scarified skin to draw out more blood by means of pressure. Wet cupping was generally used as an auxiliary to scarification. Leeching was highly suitable for bleeding purposes as hirudin, a most effective

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[13] Audrey Davis and Toby Appel, *Bloodletting Instruments in the National Museum of History and Technology*, (Smithsonian Instititution, "n.p",The Printers' Devil), 1983, p. 5.

[14] Walton Forest Dutton, *A Brief Summary of Venesection*,(Philadelphia: F.A Davis Company-Publishers, 1916), p.1.

[15]http://www.etymonline.com/index.php?search=phlebotomia&searchmode.

[16] Arteries were distinguished by the Hellenistic physicians that had the opportunity to work in an environment where dissection or as the word of mouth goes even vivisection was not impossible. Capillaries, the missing links of the blood circulation, were discovered by Malpighi in the second half of the seventeenth century, a luxury afforded by the discovery of microscope.

anticoagulant (anti-clotting enzyme) that abound in the leech's saliva, secured continuous bleeding hours after the detachment.[17]

The leeching therapy was more or less as follows: 'Leech is first dried with a bit of linen; skin of the patient is washed with warm water and shaved. The leech is usually directed with small wine glasses to the right spot, lured with a bit of milk or blood if reluctant to bite. A leech could be reused several times after they were made to disgorge their meals by dropping them in salt or vinegar.'[18] 'Leeches could be applied to the rectum and anus for relief of abdominal inflammations, to the mucus membrane of the nose to relieve chronic nose bleeds and sometimes to the vagina to stimulate menstrual flow.'[19]They would also be applied to larynx and trachea for bronchitis and for relieving the cough.[20]

These are obviously 'risky and tender' zones of the body and we understand that 'unfortunate' accidents were more than common thanks to the literature of precautions and the remedies to be administered once the leech 'got out of control'. Sometimes the leech was leashed by attaching a string on the tail so as not to lose it in the darkest depths of the body.[21]In ancient medical texts, there are recipes of various concoctions to be administered if a leech working on the trachea was accidentally swallowed.

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[17] Younis Munshi, Irfat Ara, Huma Rafique and Zahoor Ahmad, Leeching in History-A Review, *Pakistan Journal of Biological Sciences* 11(13): 1650-1653,(2008), pp. 1651

[18] Davis and Appel, p. 36.

[19]Davis and Appel, p. 34.

[20]Davis and Appel, p. 36.

[21] "n.s",History of Medicine, Bloodletting: An Early Treatment Used by Barbers, Surgeons, *Cardiology Today,* (September 2008), pp.34

In Old English, the word leech also meant doctor. In the article 'The Leech and the Physician ' it is argued that the word leech which comes into use around the tenth century had two distinct etymological roots but were joined later artificially by the folk etymology due to the close association of the annelid and the medical practitioner.[22] This can be taken as another clue of the popular utilization of the leech for medicinal purposes.

Earlier History

> L'histoire de la saignée considerée dans son ensemble, constituerait presque a elle seule l'histoire de toutes les doctrines médicales.[23]
>
> M. Malgaigne

The long durée history of bloodletting renders the diachronic vicissitudes that the concept underwent more discernible and generates a large repertoire that different cultures and 'zeitgeists' put on the more or less uniform process of letting blood. Throughout its history the same concept was sometimes filled with medical, sometimes political, sometimes shamanic connotations. In addition to the endurance of bloodletting across time, it is possible to say that the process was also widely diffused across place/geography to the point of being almost global.

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[22] Mory, Robert N.; Mindell, David; Bloom, David A.; (2000). "The Leech and the Physician: Biology, Etymology, and Medical Practice with Hirudinea medicinalis ." *World Journal of Surgery* 24 (7): 878-883. <http://hdl.handle.net/2027.42/42411> ,pp.87.

In the the old English 'laece'denoting the annelid came into use around 900A.D and was a cognate to Middle Dutch" lieke" or leech. The other English word 'laece' meaning physician originating from Germanic languages, including old Frizian 'letza' meaning physician, Old Saxon 'laki', and old high German 'lakki', which also came into use around AD 900'[22]. Mory, Robert N.; Mindell, David; Bloom, David A.; (2000). "The Leech and the Physician: Biology, Etymology, and Medical Practice with Hirudinea medicinalis ." *World Journal of Surgery* 24 (7): 878-883. <http://hdl.handle.net/2027.42/42411>

[23] Davis and Appel, p. 58.

The earliest meanings attached to the process of bloodletting can be associated with magical and shamanic beliefs. It is generally assumed that in its earliest utilization, much like trepanation, bloodletting was used to let out the bad spirits or demons from the body.[24] Although bloodletting is not commonly referred to in Egyptian medical papyri, medical historians conclude from some passages in Papyrus Ebers[25] that scarification was an accepted procedure in Egypt. Even if doctrinal documentation is scarce, the wall painting depicting a medical expert applying a leech to a patient, found in the tomb of the scribe Userhat[26] , can be taken as a clue that bloodletting might have been common on a popular level. Furthermore, Egyptians seem to have developed a connection between contaminated blood and infection, which was to become one of the main rationales of bloodletting especially in its future applications. [27]

The Talmud is another source that has considerable coverage of the issue. There are various parts and passages demonstrating that bloodletting was a common practice and that it was rare to find a person without venesection scars.[28] "The learned man is warned against living in a town without a blood letter. The passages on bloodletting in the Talmud can roughly be segregated into two parts as containing social and medicinal context. As reflected from the social context, the profile of the blood letter is closer to the artisan and below that of the physician. It is understood

[24] Gilbert R. Seighworth, "Bloodletting over the Centuries", *NY State J. Med*, 80-13, (Dec 1980), pp.2022-8.

[25] Ebers Papyrus is one of the oldest medical texts found in Egypt dating back to 1500 B.C. It is now in the library of University of Leibzig.

[26] Usherat is royal scribe who lived during the reign of Amenhotep II of Eighteenth Dynasty. Stanley Finger, Minds Behind the Brain from
A History of Pioneers and their Discoveries, (Oxford University Press, 2005), p.15

[27] Guido Manjo, *The Healing Hand*, (Harvard University Press, 1975), p. 140.

[28]Fred Rosner, Bloodletting in Talmudic Times,Available [online]
ww.ncbi.nlm.nih.gov/pmc/articles/.../pdf/bullnyacadmed00055-0065.pdf

that the blood letter often implemented the process in the patient's house. Entering the private realm brought about its own consequences for these people in the form of being labeled as potential adulterers, thieves, gluttons that ate much and well in their patient's houses and as evil eyes on the healthy folk to increase the demand for their profession. Interestingly enough, the same concern can be found in the laws of the Visigoths that forbade the physicians to bleed a woman in the absence of her relatives and fined the ones whoever touched the hand, arm and breast of a maiden.[29]

In the Talmud, the lowly status of the blood letter is further demonstrated by their exclusion from the high offices of kingship and priesthood. Another evidence as to the popularity of bloodletting is its infiltration into the legal code as the laws obliged the husband to pay the venesection cost of his wife for as long as their nuptial contract lasted. Apart from the social framework of bloodletting, there are also passages in the Talmud that concentrate on its medical implementation. There are references as to the amount of blood to be taken, to the appropriate and inappropriate days and weather conditions for bloodletting and to the diet that has to be followed before and after the pocess. Fred Rosner states that in Babylonia and Assyria, the bloodletting schedules were carved on taboo tablets which prohibited the implementation of the process on certain days".[30]

Bloodletting and the use of leeches is also covered in the great canon of Indian medicine and surgery compilation Sushruta Samhita[31] that demonstrates an

[29] Fielding H. Garrison, Fielding Garrison, "The History of Bloodletting", Yale Medical Library, reprint from the *New York Medical Journal* for(March 1& 8, 1913), pp.15

[30] The above paragraph is a summary from Fred Rosner, *Medicine in the Bible and the Talmud*, (KTAV Publishing House, Yeshiva University Press, 1977), p.87

[31] Sushruta Samitha is a collective medical text highly specialized in surgery generally attributed to the Indian doctor named Sushruta whose life is vaguely estimated in a span ranging from 600 B.C to 600 A.D, however it is certain that Sushruta Samitha was written before the eighth century A.D.

extraordinary specialization in surgery and surgical instruments. [32] The interesting part of Indian bloodletting is its instruction methodology which uses the veins of large leaves or hollow stocks of water lilies and dead animals as models to practice puncturing prior to bloodletting on humans. [33]

The Chinese traditional medicine is best known for its practice of acupuncture which is a totally bloodless procedure that does not seem to relate to its synchronic western counterpart, bloodletting. However Shigehisa Kuriyama in his article, 'Interpreting the History of Bloodletting' argues that the divide between the Hippocratic Corpus and the Huangdi Neijing more popularly known as the 'The Yellow Emperor's Classic of Medicine' is not that sharp in terms of bloodletting. He argues that bloodletting was a routine procedure in the older portions of the canon which disappeared in the later parts. Maruyama Masao suggests that the one big dissimilarity between the Chinese corpus and the Greek corpus led to the disappearance of bloodletting from the former while it established itself as a fundamental in the latter. This difference was the Chinese concentration on major arteries which could turn even a slight handshake into a lethal mistake. Kuriyama further backs his argument by Yamada Keiji's suggestion that the earlier needles mentioned in Huangdi Neijing, 'the pianshi' were a kind of bladed stone or bronze scrapel used only to puncture abscesses and to let blood.[34]

Leo M. Zimmerman, and Ilza Veith, *Great Ideas in the History of Surgery*, (Norman Publishing, 1993), p.56.

[32] Garrison, F. 'The History of Bloodletting', *New York Medical Journal* , (March, 1& 8, 1913), pp. 4-5.

[33] Garrison, p. 4-5.

[34] Shigehisa Kuriyama, 'Interpreting the History of Bloodletting', *Journal of the History of Medicine*: Vol.50, (January 1995), pp.123-144.

Traditional Tibetan medicine utilizes both bloodletting and acupuncture. It is possible to think that Tibet was influenced both by the Indian as well as the Chinese medical traditions.[35] Bloodletting occupies a fundamental place in the seventeenth century medical text 'Blue Beryl' which is decorated with artful illustrations and is an encyclopedic commentary on the “Sowa Rigpa”, Tibet's ancient science of healing.[36]There are detailed illustrations showing the seventy-seven bloodletting points and providing illustrated information as to when and how to apply the procedure.

There are cultures in which the bloodletting concept is totally devoid of medicinal and therapeutic meaning and instead carries religious and political connotations and functions. In the Mesoamerican belief systems, particularly in that of the Maya, there are numerous relics in which the royalty is depicted letting blood by puncturing themselves on highly sensitive areas like the tongue or the penis during public ceremonies. The ‘visionary snake’ that came to life within the smoke of the royal blood that is spilled on a kindled paper was regarded as a medium of communication between the gods and the earthly rulers.[37]

In the Greek case, as discussed above, bloodletting was utilized within the humoral understanding. The extensive coverage of bloodletting in the medical world could be deduced from the writings of Celsus[38] who declared that bloodletting was

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[35] John F. Avedon, Fernand Meyer, N.D. Bolsokhoeva, K.M Gerasimova, Tamdin S. Bradley, *The Budha’s Art of Healing, Tibetan Paintings Rediscovered*, Rizzoli 1998, pp.144-148.

[36] Avedon, p.145.

[37] David Drew, *The Lost Chronicles of the Maya Kings*, (University of California Press, 1999), p.251.

[38] Aulus Cornelius (ca 25 BC—ca 50) was a Roman encyclopedist, known for his extant medical work, *De Medicina*, which is believed to be the only surviving section of a much larger encyclopedia.

not a novel practice but what was novel was that there should be scarcely any malady in which blood may not be let.[39]

Humoral Pathology

> By springtime Isabella de Medici was experiencing fevers, cold sweats, vertigo, and loss of appetite alongside intense headaches. She sought isolation in order to umorezzare- indulge in her humours-as she put it in response to a letter from Paolo...[40]
>
> Many of Shakespeare's characters recognizably represent a specific humour. Falstaff is the most famous sanguine character in literature. Hamlet, of course, is the melancholy. Dane Laertes is obviously choleric, while he associates his sister Ophelia with "too much of water" — suggesting she is phlegmatic.[41]

Humoral understanding is not confined to a specific culture or locality but it is also the cement of ancient Indian, Chinese, Native American and Tibetan medical constructions.[42] However, the version that has come to dominate the Western medicine originated from the Greek version which was initially formulated in the Hippocratic Corpus. The corpus is believed to have been written by various authors between 420 B.C and 320 B.C. and was largely compiled in the medical centre of the Greco-Roman world, Alexandria, around 280 B.C.[43]

It would not be wrong to argue that if it was Hippocrates and the Hippocratic Corpus that formulized humoral theory and endowed the understanding with a

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[39] Audrey Davis and Toby Appel, p.3

[40] Nora Arikha, *Passions and Tempers*, (New York: Harper Perennial, 2007),p.156

[41] http://classweb.gmu.edu/rnanian/humours.html

[42] http://ocp.hul.harvard.edu/contagion/humoraltheory.html

[43] Vivian Nutton, "Medicine in the Greek World, in *The Western Medical Tradition* edited by Lawrence I. Conrad, Micheal Neve, Vivian Nutton, Roy Porter& Andrew Wear,, (Cambridge University Press,1995), p.21.

scientific foundation, it was Galen of Pergamum who elaborated it into a paradigm which would "set the main tones and moreover the 'philosophy of medicine'"[44] for more than a millennium. Galen (129-216), the gigantic figure of the Roman medicine, the private doctor of Marcus Aurelius, and the author of over three hundred and fifty authentic titles[45], was so influential and popular that until 1840s the Doctors of Medicine at Oxford University were required to expound passages from Galen for their degree.[46] Presently, Galen is at once accepted as the most important and in some cases the only source to ancient Greek medicine and also as the one who shaped and sealed the history of the period according to his subjective views and interests. Vivian Nutton argues that Hippocratic humoral theory was not the mainstream paradigm as Galen had wanted his readers to believe but rather one circulating among many others like the theories of Erasistratus (304 BC- 250 B.C.) and Herophilus (335BC-280 BC). Nutton claims that humoral theory as formulized by Hippocrates became a universal standard only after Galen's ''fatal" embrace. [47]

The model of malady, the conceptualization of illness that is generally deduced from the Hippocratic-Galenic formulation, basically assumes health as a state of precarious 'balance', a krasis[48] open to the disrupting effects of the internal

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[44] The term "philosophy of medicine" is borrowed from Owsei Temkin:
Owsei Temkin G*alenism, The Rise and Decline of a Medical Philosophy*, Cornell Publications in the History of Science, (Cornell University Press, 1973)

[45] Porter, *The Greatest Benefit to Mankind*, p.73

[46] G.E.R Lloyd, *The Transformations of Ancient Medicine*, The Fielding H. Garrison Lecture, American Association for the History of Medicine, Cleveland, Ohaio, (2 May, 1991), pp.114

[47] Vivian Nutton, The Fatal Embrace: Galen and the History of the Ancient Medicine, Science in Context, 18(1),111-121 (2005), Cambridge University Press.

[48] The Greek word "krasis" which is much used in philosophy has the meaning of intentional, artful or even harmonious blending alongside its meanings as temperament of the mind or the body, temperature, union and harmony. The word later came to be used to denote the mixing of water and wine on a certain proportion.

and external variables. What is meant by 'balance' is the balance of the fluids or juices that were believed to be inbuilt in the body and were commonly called the humours, the "cymoi".

"On the Nature of Man" which is one of the most popular texts of the Hippocratic Corpus describes this balance as such; "Health is primarily that state in which these constituent substances (the humours) are in the correct proportion to each other, both in strength and quantity, and are well mixed. Pain occurs when one of the substances presents either a deficiency or an excess, or is separated in the body and not mixed with the others."[49] Thus, the cure was regarded mainly as a matter of bringing the humors back to a state of balance and into a position of harmony.

There are four humors: blood, phlegm, yellow bile (choler) and black bile. It is widely assumed that this scheme has been inspired by or developed mutually with pre-Socratic philosophy. The humoral theory is generally regarded as being symmetrical to Empedoclean philosophy which identifies the four elements; fire, air, water and earth as the basis of all earthly structures. Empedocles argues that the different proportions/mixes of these indestructible and unchangeable elements combine to form all the variety of earthly matter.[50] Likewise it was believed that the blending of different proportions of humors made up the nature of man's body.[51]

John M. Paton and Anthony Preus, *'Essays on Ancient Greek Philosophy'*, (New York: State University of New York Press, 1983), p.48

[49] Hippocrates, G.E.R Lloyd ed., *Hippocratic Writings*: *On The Nature of Man'*, (Penguin Classics, 1983) p.262

[50] William Keith, Chambers Guthrie, *A History of Greek Philosophy: The Presocratic Tradition from Parmenides to Democritus*, (Cambridge University Press, 1979) p. 122-130

[51] Arikha, p.8.

Vivian Nutton and Roy Porter point out that black bile is the latest comer in humoral formulation, appearing for the first time in “On the Nature of Man”.[52] Last but not least, black bile became a highly popular humor, a piquant subject matter to literature and rhetoric. It was seen responsible for man’s depressive but potentially creative part for ‘I fill with black bile’ literally meant ‘melancholao’ in Greek.[53] In the early modern England, melancholy, creativity, learnedness and mental ability came to be regarded as such bosom friends that no scholar wanted to achieve the ever elusive perfect balance of humors.[54]

Today, we know that there is no substance in our body that corresponds to black bile; medical historians guess that it might be a form of dried blood. In fact, in 1921 Fahraeus, a Swedish physician claimed that the theory of four humours might have been developed out of the observation of blood clotting. ‘When blood is drawn in a glass container and left undisturbed for about an hour, four different layers can be seen. A dark clot forms at the bottom (the "black bile"). Above the clot is a layer of red blood cells (the "blood"). Above this is a whitish layer of white blood cells (the "phlegm"). The top layer is clear yellow serum (the "yellow bile"). [55]

It is another a general assumption in medical history books that black bile might be added to the rest to create an absolute symmetry with the theory of four elements, complete with binary oppositions. Consequently, the four humors became

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[52] Nutton, *The Western Tradition*, p. 24-25

[53] Arikha, p.9

[54] Douglas Trevor, *The Poetics of Melancholy in Early Modern England*, (Cambridge University Press, 2004), p.6

[55]Hart GD. "Descriptions of Blood and Blood Disorders Before the Advent of Laboratory Studies". *Br. J. Haematol.* (December 2001) **115** (4): 719–28.

also relatable/ transferable to other popular quadripartite patterns acquiring greater explanatory power and influence.

In the basic scheme blood corresponded to air, phlegm to water, yellow bile to fire and black bile to earth. Furthermore, to each humor corresponded two of the basic qualities associated with its element: blood was hot and moist, phlegm was cold and moist, choler or yellow bile was hot and dry, and black bile was cold and dry.[56]

The other highly important set of correlations is the association four main temperaments to corresponding dominant humors. According to the theory, dominance of the humor blood in the individual's physical constitution imposes a sanguine character. Likewise, the humor phlegm imposes phlegmatic, the humor bile a choleric and the humor black bile a melancholic temperament. [57] The adjective 'good-humored' we use today is a legacy of the humoral understanding. It would not be out of place to argue that the efforts to explain and predict behavior in terms of the humoral framework can also be regarded as an early attempt of psychoanalysis. Shakespeare constitutes a very good example of this psychological utilization of humors, for many actions of his characters are rationalized by their humoral constitutions and humoral imbalances.[58]

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[56] Arikha, p 6

[57]According to humoural framework, a sanguine person was supposed to be optimistic, cheerful, fun-loving, generous, amorous and large-framed with a pink or red complexion. A choleric (dominance of yellow bile) person was ambitious, energetic, direct, slim, wiry and red-haired. A melancholic person was thoughtful, introspective, reflective slim, fair and not muscular. A Phlegmatic was person emotional, mild, passive, sensitive, intuitive, fleshy and fair. ' If the humours got out of balance both the temperaments and characters also got disturbed and flipped to their down-sides.
Available [online]: http://classweb.gmu.edu/rnanian/humours.html

[58] John William Draper, *The Humours and Shakespeare's Characters*, (Brooklyn: AMS Press, 1970).

Throughout time the four humors were related to the four Evangelists, the four seasons, the four ages of man, the four periods of the day, the four types of fever and even to the four tonalities of music.[59] Indeed, years later when Francis Bacon quoted about the healing power of music, he was still very much talking through the frame and terminology of humoral pathology: "The poets did well to conjoin music and medicine in Apollo because the office of medicine is but to tune the curious harp of man's body and to reduce it to harmony"[60]

The repertoire of correlations embraced astrological signs, internal organs and even national characteristics, assuming that locality and environmental factors determined specific characteristics by playing on humours. As stated in *Airs, Waters and Places*: "the white, cold, flabby and phlegmatic inhabitants of the Ukraine were contrasted with the dark, hot, scrawny, and bilious Libyans, and still more, with the well-balanced Greeks in their well balanced climate"[61]

The theory welcomed also the interaction of diet as almost every food and herb was regarded as playing on the humors since they were believed to have the capacity to moisturize dry, heat and cool the body depending on their essences. The

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Paster Gail Kern, *Humouring the Body: Emotions and the Shakespearean Stage*, (University of Chicago Press, 2004)

[59] Blood: morning, red, sweet, continous fever, heart, lydian and hypolodian modes, Jupiter, Gemini, Libra, Aquarius. Choler**:** midday, yellow, bitter, tertiary fever, spleen, phyrigian, and hypophyrigian modes, Mars, Aries, Leo, Sagittarius. Melancholy: afternoon, black, sour, quartan fever, liver, mixolydian and hipomixolydian modes, Saturn, Taurus, Virgo, Capricorn. Phlegm**:** evening, white, salty, quotidian fever, brain, dorian and hypodorian modes, Moon, Cancer, Scorpio, Pisces... Akhira, p.11.

[60] Medicine and Music, The National Library of Medicine, pp1. Available[online]: *www.nlm.nih.gov/hmd/pdf/medicineandmusic.pdf*

[61] Nutton, *The Western Medical Tradition*, p. 24.

humoral theory worked in the principle of opposites which called for a heating and drying food regiment if the disease had a cold and moist nature.[62]

So many variables were embedded within the humoral way of thinking that it provided the medical men with a large space to maneuver and with intellectual acrobatics in giving meaning to medical phenomena, and gave them the possibility to construct a large repertoire of correlations to explain both the pathology and the psychology of the patient.

The humors and their proportions, deficiency and abundance in the body constituted the fundamentals of "humoral pathology theory" which served as the mainstream medical theory for centuries and knighted bloodletting as its most 'heroic' therapy.

The basic connection between humoral pathology and its most popular instrument, bloodletting, is the idea of removing the excess blood (phletora) accumulated and possibly putrefied in the body. Glasscheib proposes that bodily processes like sweating, mucus secretion, nose bleeding and menstruation in women contributed to the assumption that it was a built in mechanism of the body to restore the disturbed harmony of the humors by expelling the excess.[63] In short, bloodletting was used to mimic the body's mechanism to remove the overload as a therapy of evacuation. Another contributing factor to resorting to evacuation therapy was the fact that blood circulation was unknown till seventeenth century and it was commonly believed that food was transmutated into blood in the liver and that this created the rationale to evacuate an ever mounting reserve of blood.

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[62] Nancy G. Siraisi, *Medieval and Early Renaissance Medicine*, (The University of Chicago Press, 1990), p.116.

[63]Glasscheib, *The March of the Medicine*,(New York: Putnam's Sons, 1964), p. 154.

The theory of humoral pathology as proposed by Hippocrates and paradigmatized by Galen seems like a light which waxes somewhere else as it wanes in a particular locality. In the turmoil of the fall of Rome, humoral pathology found air pockets of survival in Byzantium and northern Italy. By the fifth and sixth centuries, some iatrosophists[64] in the Byzantine world were teaching the Hippocratic- Galenic tradition, and by the sixth century, only a few Galenic texts had been translated into Latin, especially in Ravenna.[65]

The tradition was on the decline, and according to Nutton, "the practical and empirical side of his (Galen) work was replaced by the dogmatic, although a logically structured systematization of all his many hypothesis was not achieved until Avicenna".[66]

Arabo-Persian Reflections

> The soul follows the temperament of the body, if an illness occurs, especially in the main organs, do not forgo to treat the soul through sense, sight and pleasant sound; this constitutes an important part of the treatment.[67]
>
> Ibn-Masawayh
>
> The Almighty Creator has bestowed upon every animal and every one of its organs the most appropriate and best adapted temperament for its nature, functions and conditions. ...Similarly every organ is endowed with a hot, cold, dry or moist temperament appropriate to its functional requirements. [68]
>
> Avicenna

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[64] İatrosophists were medical men that concentrated on the teaching of medical theory and it is widely assumed that they did not engage in medical practice. Their approach to medicine was rather philosophical. Their medical curriculum was largely based on Hippocrates and Galen.
Journal of the History of Medicine and Allied Sciences 1984 39(4):476-477; doi:10.1093/jhmas/39.4.476
© 1984 by Oxford University Press, p.476
Owsei Temkin, *The Double Face of Janus and Other Essays in the History of Medicine*, (John Hopkins University Press, 2006), p.193

[65] Arikha p, 46.

[66] Nutton, *The Western Medical Tradition*, p.81.

[67] Arikha, p. 51.

[68] Arikha, p. 65.

As the Hippocratic-Galenic medical accumulation was losing its edge in the Classical world, Alexandria fell to the Umayyad Arabs in the seventh century. In the medical world this meant the gradual cessation of Alexandrian Medical School that had carried, generated, circulated and transmitted much of the Hellenic medical accumulation and the shifting of the medical axis towards the east, first to Antioch and then to Gondeshapur and Baghdad.[69]

Bloodletting, firmly packed within the humoral framework, entered the Arabo-Persian culture unfolding swiftly by the intense translation period triggered by the interaction of rulers willing to offer academic patronage and the highly cross cultural and intellectual environment. Greek, Jew, Arab, Persian and Syrian intellectuals, Christian doctors working for the Abbasid caliphs, persecuted Nestorian Christians and dissident Neo-Platonists who fled to Gondeshapur from the wrath of Emperor Justinian became engaged in intense intellectual correspondence, but it was the philosophy of medicine that attracted the deepest attention.[70]

The library founded at the time of al-Ma'mun (786-833), the son of celebrated caliph Harun Rashid (763-809), which is popularly known as the House of Wisdom (Bayt al- Hikma) became engaged in an intense program of translating Greek texts of medicine, mathematics, geography, astrology, philosophy, logic and astronomy into Syriac and Arabic.[71] Highly prolific translators like İbn-i Masawayh (777-857) and Hunayn ibn-Is'haq al-Ibadi (808-873) of Nestorian Christian origin emerged in this

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[69] Arikha, p. 49.

[70] Tariq Ali, "Mullahs and Heretics", *London Review of Books*, Vol.24, No.3, (7 Feb. 2002), pp.7-14.

[71] Julie Scot Meisami and Paul Starkey, *Encyclopedia of Arabic Literature Vol I*, (Taylor& Francis, 1998), p.295.

multi-lingual environment where Coptic, Syriac, Aramaic, Pahlavi were spoken and where Greek still retained its place as a medium of administrative and academic communication.[72] In addition to translating numerous works of Hippocrates and Galen into Arabic, these translators themselves wrote many medical books. Hunayn's book "Kitab al Mudkhal-fi't-Tıbb" which is based on the Alexandrian summary of Galenic texts would later circulate in the west as "Isagoge Johanitti in Tegni Galeni" and Hunayn would be Christianized as Johannitus.[73] It is assumed that at that time, Arabs possessed many more Galenic and pseudo- Galenic writings than we have today.[74]

It is important to note here that the statement that the humoral understanding of medicine and bloodletting entered the Arabic world only through the Hellenistic channel is a problematic one. Indian influence is another factor that must be considered. Indian medicine also has a humoral framework known as the tridosa doctrine assumed to be formulated and developed during the Vedic Period (circa 1500B.C- 800 B.C).[75]Alongside many important texts, Susruta-Samhita, which is a significant medical work that gives much information on the three Indian humors and on bloodletting, is said to have been translated into Arabic around the eighth century.[76] Furthermore, though there is no mention of bloodletting in the Quran, there are plenty of references to the procedure in Sahih-i Buhari , one of the six canonical hadith collections of Islam compiled within the life time of al-Buhari (810-

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[72] Arikha, p.48.

[73] Arikha, p.51.

[74] Manfred Ullmann, *Islamic Medicine*, (Edinburgh University Press, 1978) , p.10

[75] Charles M. Tipton, "Susruta of India", *J.Appl.Physiol*,104: 1553-1556,2008

[76] "Ibn-an-Nadim relates that the translation was commissioned to an Indian doctor." Ullmann, p.20.

870). [77] Very little is known about the medicine of the early Islamic and Umayyad periods. Bloodletting was possibly already used in Arabic medicine without the humoral doctrine or, Arabs had an idea of humors and bloodletting from the Indian medicine or from some other source, or conversely, the later Islamic notables were quick to introduce this pagan but nevertheless fundamental therapy into their medical culture by setting the prophet as an example.

The Arabo-Persian culture soon began to develop its own medical philosophers like Avicenna (980-1037), Rhazes (865-925), Al-Biruni (973-1048), Al-Nafis (1213-1288) and Averroes (1126-1198). In terms of the medical theory and humoral pathology, Avicenna is one of the most important Arabic thinkers, and by the early Renaissance, his book 'Al Qanun fi't- Tıbb', Latinized as "Canon", became the most often printed work after the Bible.[78] In the western medical world, he acquired titles such as the Galen of Islam and his prestige was crowned by Dante who placed him between Hippocrates and Galen in the first circle of his Inferno.[79] He combined his own views with humoral understanding to establish a new doctrine to explain the mechanisms of various diseases and extended the theory of temperaments.[80]

As different from Galen and Hippocrates, Avicenna gave much importance to leeching as he believed that the annelids had access to deeper sources of blood.[81] In Canon he devoted several pages to leeches, their medical characteristics and methods

[77]Konyalı Vehbi Efendi, *Sahih-i Buhari Muhtasarı*, Doğan Güneş Yayınları, İstanbul, 4. Cild.
[78] Arikha, p.67-68

[79] Dante Alighieri, John D. Sinclair, *Readings on Inferno of Dante*, (Oxford University Press ,1961), p .65

[80] O.C Grunner, *A Treatise on the Canon of Medicine of Avicenna Incorporating a Translation of the First Book.* 1st Edn, , (London: Luzac and Co., 1930) p,513.

[81] Grunner, p. 514.

of application.[82] The most important change bloodletting underwent in the Islamic medicine is the principle of 'derivatio' which dictated bleeding the vein from the closest location and the same side of the ailing part of the body. The Islamic medicine preferred the 'revulsio' principle, drawing the blood from the opposite side and as far from the ailment as possible.[83]

The evaluation of this period by western scientific historiography can best be summarized in the words of Paul Tannery, one of the pioneers of history of science: "Science originated in Hellenic Greece, passed through Islamic stewardship to Medieval Europe, and then blossomed in the seventeenth century'.[84] Ullmann, who uses the term "Arabism of the medicine in the West" for the period when Islamic accumulation spread in the West, refuses any originality on the part of the Arabs which he apologetically blames on the 'zeitgeist' of the Islamic Middle Ages that did not permit 'any desire for empirical knowledge of reality'.[85] This approach appears questionable if we think about the contributions of Avicenna or Al Razes who placed a serious critique on Galen and the humoral understanding in his book 'Doubts on Galen' (Shukuk 'ala Alinusor) basing his arguments on experimentation.[86] Al-Nafis is credited with being the first physician to describe pulmonary circulation was demonstrated by Harvey in the seventeenth century, and which constituted one of the first in the long line of discoveries that would eventually

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[82] Mory, Robert N.; Mindell, David; Bloom, David A"The Leech and the Physician: Biology, Etymology, and Medical Practice with Hirudinea medicinalis ." World Journal of Surgery 24 (7): 878-883, (2000). Available [online], http://hdl.handle.net/2027.42/42411, pp.880.

[83] Audrey Davis and Toby Appel, p.41.

[84] Lewis Pyenson and Susan Sheets, *Servants of Nature*, (WW Norton and Company, 1999), p. 6.

[85] Ullmann, Islamic Science, p.23.

[86] R. Shane Tubbs, Mohammadali M. Shoja, Marios Loukas, W. Jerry Oakes, Abubakr Muhammad Ibn Zkaraia Razi," Rhazes" *Child. Ner. Syst*.(2007),23:1225-6.

lead to the demise of bloodletting. [87] Recently, this "passive transmitter" view and the use of "Arabic science as an excavation site to track Hellenism"[88] is being challenged by the revisionist history.

Renaissance

Bleeding the body purges in disguise
For it excites the nerves, improves the eyes
And mind, and gives the bowels exercise
Brings sleep, clear thoughts, and sadness drives away,
And hearing, strength and voice augments each day."

A verse from Regimen Sanitatis Salernum.[89]

Toledo was re-conquered by the Spanish in 1058, but many Arabs and Arabic speaking Jews remained in Toledo, which became a centre where Arabic learning was passed to the rest of the continent.[90] Another key factor that is considered to have linked the Arabic medical accumulation with the west is the translations of Constantinus Africanus (1020-1087). He was born in Tunis, but later converted to Christianity and became a monk in the Benedictine monastery of Monte Cassino. Constantinus translated the most important Arabic medical works into Latin.[91] Although the Bible prohibited the cutting into the skin[92] and Galen was pagan with a

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[87] Joseph W. Meri, Jehe L. Bacharach, *Medieval Islamic Civilization*, A-K İndex, (Taylor and Francis, 2006), pp.348.

[88] Roshdi Rashed ed., *Encyclopedia of the History of Arabic Science* Vol.I, (Routledge, 1996), p. 2.

[89] Garrison, p.12.

[90] Ullmann, p.53.

[91] Ullmann, Islamic Medicine, p.53.

[92] Leviticus 19:28. "You may not make cuts in your flesh in respect for the dead, or have marks printed on your bodies: I am the Lord."

serious critique on Christianity, Galenism and bloodletting was welcomed in the Latin Christendom. Nora Arikha argues that there was compatibility between Galen's teleological way of thinking and the monotheistic religions, and that he was sort of de- paganised with popular stories which turned him into a Christian who died during pilgrimage or claimed that he in fact was the uncle of Saint Paul.[93]

In this period, monasteries emerged as medical centers, turning the knowhow accumulated from translations into practice. However because any documentation outside monastic medicine was scarce, as Katherine Park reminds us, we must resist the common tendency to reduce Middle Age medicine into monastic medicine, which was largely monopolized by monks and subordinated to religious values and concerns.[94]

In England most of the Abbeys had a "flebotomaria" or bleeding house in which the residents underwent bleedings at stated periods of the year.[95] The brethren of the order of St. Victor underwent five bleedings annually: before Advent, before Lent, after Easter, May Day and Pentecost.[96] The case of Peter the Venerable, Abbot of Cluny demonstrates (d. 1156) the extent to which humoral theory and bloodletting was established in the monastic medicine and how the intuitiveness of the humours opened space for individual interventions on prescribed therapies. "Peter suffered from an attack of catarrh which is mostly associated with the common cold and deep coughs. Although the doctors forbade him bloodletting, Peter began to fear that an

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[93] Arikha,p.55.

[94]Katherine Park, Medicine and Society in Medieval Europe, 500-1500," in Andrew Wear, ed., *Medicine in Society*,(Cambridge: Cambridge University Press, 1991), 59-90, pp.65

[95] Liakat Ali Parapia, pp.490

[96] Liakat Ali Parapia, pp.490

overabundance of blood and phlegm would bring on a fever. Hence he had twice large amount of blood drawn within three weeks. The situation got worse so Peter consulted other medici, and they prescribed him to use moistening and heating foods and medicines but Peter objected to this following the Galenic theory of cure by contraries and thought that his cold and moist disease ought to be countered by hot and dry. Hence he took hyssop, cumin, liquorice, or figs steeped in wine and syrups of tragacanth, butter or ginger."[97]

The end of monastic medicine and the disappearance of clerics as medici and consequently as blood letters is commonly ascribed to the Council of Tours (1163) and sometimes to the Canon of the Lateran Council (1215). It is generally assumed these charters had banned ecclesiastics from surgical intervention. However, Charles Talbot argues that the principle 'ecclesia abhorret a sanguine' is a ghost statement that does not exist in the mentioned documents. [98] Recent historiography claims that the use of the word 'blood' in these charters is related to battles and war and that it is an eighteenth century hoax to twist the meaning into medicine.[99]

Nevertheless, the clerics left the scene as medici, and another group, this time not from the elite and the highly learned, but from amongst the artisans, entered the bloodletting scene: the barber surgeons. Barbers who were no strangers to the use of razors came to be the adress for anyone who demanded minor surgical interventions. In England, to disttinguish themselves from the surgeons with whom they shared the same guild until 1880, the barber surgeons placed a striped pole or a

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[97] Nancy G. Siraisi, *Medieval and Early Renaissance Medicine*, (The University of Chicago Press, 1990), p.115-116.

[98] Charles H. Talbot, *Medicine in Medieval England*,(London: Oldbourne, 1967), p.55.

[99] Louis N. Magner, *A History of Medicine*, (Taylor and Francis, 2005) , p.157.

signboard outside their door from which a basin for receiving blood was suspended.[100] Cervantes used this type of bowl as the 'Helmet of Mambrino' in Don Quixote.[101] Bowls used only for bleeding usually had a semicircular indentation on one side. Italian families had a tradition of passing special glass bleeding vessels from generation to generation which constitutes another collectible item of bloodletting which had always created its fashion and collectibles in the form of lancets, lancet cases, cupping apparel and fine porcelain leech jars. The striped pole attached to the bowl represented the stick gripped by the patients hand to prevent bleeding from his arm. The white stripe on the pole corresponded to the tourniqet applied above the vein to be opened.[102] Barber surgeons continued to let blood through the seventeenth century. In the eighteenth and nineteenth centuries, the better educated surgeon and sometimes the physician also entered the humoural scene as bloodletters.

Meanwhile, humoral understanding and bloodletting was slowly taken over by the first medical schools that grew out of monastic dispensaries. The School of Salerno is commonly accepted to be the first of these schools. Salerno lived its golden age during the twelfth and thirteenth centuries and came to be known as the house of Hipoccrates.[103] A thirteenth century Salernitan poem condems the Jew, the monk, the actor, the barber and the old woman who seek profit and damage the power of medicine[104], possibly signaling to a gradual 'specialization' of medicine.

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[100] James O. Robinson, "The Barber Surgeons of London", *Arch. Surg*. Vol. 119, (Oct 1984), 1771-1775.

[101] Fred Weinberg, "Bloodletting", in *Canadian Family Physicians*, Vol.40, (January 1994), pp.132

[102] Fred Weinberg, "Bloodletting", pp.132.

[103] A. A Ferreira, "Salerno, city of Hippocrates", *Rev. Paul. Med*, (Sep 1971);78(2):85-90.

However, the most important document that is attributed to the monastery in terms of humoral theory is "Regiment Sanitatis Salernitanum", beleived to have been procuced between twelveth and thirteenth centuries. It is an instructive/educative poem of health written completely within the framework and terminology of humoral theory advocating bloodletting as a most efficient remedy. The popular rumour lying behind this poem is that it was composed for the benefit of King Robert of Normandy who was cured of a wound in Salerno.[105] In late fifteenth century, some 150 editions of this text were printed in various languages and its various versions circulated widely for centuries.[106] The physicians of Salerno made extensive use of leeches in removing the excess body fluids.[107] The teachings of the Salernitan physicians disseminated to the rest of the Continent and the later Galenists came to beleive that the elemination of fluids by the use of leeches promted an internal combustion of the residual disease material in the body by prompting natural healing.[108]

Bloodletting was also recommended during Black Death, both the famed physician Gentile da Folignio and the Paris Faculty prescribed bloodletting and opening the bubos from the different veins.[109]

With the Renaissance, astrological influences increasingly infiltrated into science and medicine. This trend is reflected in the appeareance of Bloodletting

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[104] Arikha, p.89.

[105] Garrison, *Bloodletting*, pp.12.

[106] Garrison, *Bloodletting*, pp.12.

[107] Andreas Michalsen, Manfred Roth, Gustav Dobos, Michael Aurich,,*Medicinal Leeching*, (Thieme, 2007), p.6.

[108] Andreas Michalsen, p.6.

[109]Joseph Patrick Byrne, *Daily Life During Black Death*, (Greenwood Publishing Group, 2006), p.58.

Calendars known in German as the *Aderlasskalendar*. In fact, the earliest printed document relating to medicine was a bloodletting calendar printed in 1457 by Gutenberg in the type of his thirty six line Bible in Mainz.[110] "These calendars consisted of a single sheet with some astronomical figures and a diagram of a man depicting the influence of the stars and the signs of zodiac on each part of the body, as well as the parts of the anatomy suitable for bleeding."[111] This genre produced the vein man or the zodiac man that also functioned as anatomical textbooks. The woodcut produced by the sixteenth century mathematician Johannes Stoeffer illustrate[112] the fifty three points where the lancet might be inserted or the leech might be attached.[113] The almanacs and the woodcut anatomy also became popular in America during the seventeenth century.[114] Sometimes, the family Bible also contained a list of the favourable and unfavourable days in each month for bleeding.[115]

Voltaire, in his book "The SunKing" identifies four happy and glorious ages in the whole history of mankind, the third one being the conquest of Istanbul.[116] For Voltaire, this hapiness has got nothing to do with the success of Ottomans but arises from the fact that the conquest kicked off another translation period which, in turn

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[110] Audrey Davis and Toby Appel, p.7.

[111] Audrey Davis and Toby Appel , p.7.

[112] Audrey Davis and Toby Appel, p.7.

[113] Audrey Davis and Toby Appel, p.7.

[114] F Garrison, pp.19.

[115] Davis and Appel, p.8.

[116] Voltaire, *Age of Louis XIV*, trans. Martyn P. Pollack, (London: J.M. Dent & Sons Ltd. , 1958), p.1-2.

triggered the Enlightenment as an unintended consequence. [117]Indeed by the late fiftteent century, all the Greek texts that had been acessible through the Arab translations and Arab scholarship became acessible in their original form and language thanks to the fleeing Greek scholars fleeing from Istanbul. In 1525, the famous Aldine Press in Venice published the complete works of Galen in Greek, evaluated by some as the revival of the pure word as opposed to the Avicenna's corrupt versions.[118] The rivalry between the Greek and Arab versions erupted as a controversy in the sixteenth century. The medieval practice based on the Moslem emphasis on "revulsio", bleeding as far from the ailment as possible, was attacked by a Paris physician Pierre Brissot in 1514 who defended "derivatio" bleeding near the locus of the disease as it was suggested by Galen. He was declared a medical heretic by the Paris Faculty of Medicine and derivative bleeding was forbidden by an act of the French Parliament. Andreas Vesalius(1514-1564) [119] came to support Brissot with his famous venesection letter.[120] The controversy would soon lose ground by the discovery of blood circulation in 1628 by Harvey (1578-1657). Despite the unveiling of many anatomical mistakes of Galen by "De Humani Corporis Fabrica" and the discovery of blood circulation, both Vesalius and Harvey retained their belief that bloodletting was the most salutary and effective among all medical remedies.[121]

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[117] Voltaire, p.2.

[118] Roy Porter, The Greatest Benefit to Mankind, p.171.

[119] Vesalius is the author of one of the most influential books on anatomy: De Humani Corporis Fabrica.

[120] Charles D. O'Malley, *Andreas Vesalius of Brussels 1514-1564*, (University of California Press, 1964), p. 66-67

[121] Schneeberg, pp. 171.

> It was rumoured that aristocratic ladies were periodically bled to maintain their clear, pale skin to distinguish themselves from the peasantry.[122]

However, all these new finidings started to build up a critical undercurrent as increasingly the data in hand did not exactly fit the paradigm that was supposed to explain it. If we are to evaluate the humoral pathology through a Kuhnian framework[123], the seventeenth century phase fits the phase of "normal science" where anomalies that can not be resolved by the existing paradigm abound and crescendo into crisis. Humoral pathology might be one of the slowest paradigms to shift, as it took two more centuries and works of many men to reach the "revolutionary science" phase in which the new paradigm that is supposed to be inconmennsurable with the old one took over.

The first serious challange to humoral theory came back in the sixteenth century from Theophrastus Bombastus of Hohenheim, better known as Paracelsus (1491-1541), who is best remembered for doctoring Erasmus and throwing Avicenna's Canon into the celebratory bonfire on a St. John's Day in a frenzy of protest.[124] He is seen as Renaissance Magus with his focus on visionary Christian mysticism, alchemy and Hermetic texts. Although not refusing humoral pathology completely, his emphasis was on magic rather than the rationalist and "pagan" tradition of Galen. He proposed chemical methods and a chemical understanding of medicine and science in general, which was quite congruent with his alchemic interests. The chemical understanding of Parcelsus gave rise to iatrochemistry which

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[122] Glasscheib, p.164.

[123] Thomas S. Kuhn, *The Structure of Scientific of Scientific Revolutions*,(University of Chicago Press, 1970).

[124] Arikha, *Passions and Tempers*, p.135.

would endow the medical understanding of the seventeenth century with a more chemical view of the human body.[125]

Iatrochemists were generally opposed to bloodletting, they believed that the practice shortened the life of the patient and that it was against Holy Scripture which defined blood as the locus of soul and the source of life energy. However, they regarded medical leeching indispensible as it was a remedy of the nature and as it did not cause 'asthenia', a frequent complication of venesection and cupping.[126]

The early eighteenth century witnessed the emergence of the new atomic and corpuscular mechanical philosophy fuelled by the Newtonian theories and the rise of iatromechanics who accepted the fusion of chemistry and mechanics, suggesting mechanical models for chemical processes.[127] Galenism did not die out but space was opened for alternative approaches and ecclectic understandings that merged iatrochemistry, iatromechanics and humoral pathology.

According to Lester King, the seventeenth century revolution mainly lies in the degradation of the primary qualities (hot/cold/moist and dry) as developed by Aristotle and which formed the backbone of scientific speculation and particularly humoral pathology for the following two millenia. Lester traces this transformation especially in the writings of Boyle which carry extraordinary similarities with Galen

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[125] Andrew Wear ed., *Medicine in Society*, p.5

[126] Michalsen, p.7

[127] Willbur Applebaum, *The Encyclopedia of Scientific Revolution from Copernicus to Newton*, Routledge, 2008, p.319-321

but which clearly refuse to accept the qualities as primary and reduces the qualities percieved through the senses to a secondary position.[128]

Around the mid-eighteenth century, there was a revived interest in the ancient medical texts associated with the rise of medical history and with what M.E. Butler called the "tyranny of Greece over Germany" as a part of the positivist Bildung and Kultur movement.[129]One of the colossal products of this period is the Corpus Medicorum, which is a catalogue of the surviving ancient medical manuscripts. These texts, during the eighteenth and early nineteenth century were still translated with a pragmatic and functional concern so that they could add onto the existing useful medical knowledge and broaden the horizons of the physicians.

However, while the humoral system was challenged both theoretically and philosphically during the seventeenth and early eighteenth centuries, the humours continued to flow swiftly. The whole body of treatments taught and written in medical texts still depended heavily on Hippocrates and Galen.[130] John Finch who travelled in France around 1654 noted in his memoirs that 'The French physicians it seemed were true to their reputation: they would never prescribe anything be the disease what it will, but letting bloud.'[131]

Humoral system, of course, was not only confined to theory and blood continued to flow also in the practical daily life and in the domestic realm. In 1737,

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[128] Lester King, "Paracelsian Medicine" in Alan Debus ed., *Medicine in the seventeenth century England*, p. 19

[129] Vivian Nutton, "Ancient Medicine from Berlin to Baltimore" in Frank Huisman and John Harley Warner ed. *Locating Medical History: The Stories and their Meanings*, The John Hopkins University Press, 2004, pp.117.

[130] Allen G. Debus, Medicine in Seventeenth Century England, p.132.

[131] Garrison, pp.24

seventy-five percent of patients in the British Royal Infirmary were subjected to bloodletting.

Glasscheib in his book "The March of Medicine" portrays a most colorful account: "Bleeding reigned supreme, it accompanied men at every step. Blood was let in cases of joy and sorrow or in delirium, in the courts of Postdam and Versailles, in the baths of the smallest village and bodouirs of elegant ladies. Every spring Frederick the Great's soldiers, on the order of his majesty's court physician Georg Ernst Stahl, were paraded in companies to be bled."[132]

Dorothy Porter and Roy Porter, who concentrate on the daily reflections and applications of medicine and largely asemble their data from letters and memoirs of the eighteenth century England, portray bloodletting as a highly domestic remedy. Bloodletting could ocasionally be performed by a family member a servant or in the case of a Lord Chesterfield performed during a home gathering among important politician guests uponwhich the Lord did not pass the opportunity to claim that he had shed his blood for the good of his country.[133] The documents reveal that there were people who performed self-bleeding many times during the course of their lives, a Charles Waterton recorded near the close of his life that he has bled himself 136 times[134] , or that the process of bloodletting was often preceded by negotiations with the doctor whether or not or to what extent to get the therapy. A certain Sir Samuel Romilly even kept his own pair of pet leeches after they "saved" his life,

[132] Glasscheib, pp.164.

[133] Dorothy Porter and Roy Porter, Doctors and Doctoring in Eighteenth-century England, p.45.

[134] Porter, p.50.

provided them with fresh water everyday and named them after the two leading surgeons of his lifetime.[135]

As an old English verse said "a bleeding in the spring is a physic for a King,"[136] the royalty had their fair share of bloodletting throughout history. King George IV (1762-1830) survived a bleeding of 150 ounces and his recovery was credited to bloodletting.[137] It was not always the upper strata of society that enjoyed or suffered bloodletting. During springtime, the countryfolk of the early Victorian East Anglia who walked into the surgery after their work in the market to bleed themselves until they fainted.[138]

In popular perception, on the other hand, the emergence of a significant critical look towards bloodletting was triggered by the controversy over George Washington's death. "Following a severe sore throat Washington who was a firm believer in bleeding was first bled on his own request and then bled many times more on his doctor's demand resulting in an evacuation totaling to an approximate of 82 ounces (Corresponds to 2.5 liters of blood whereas the total amount in the body is approximately 5 to 6 liters). After his death, a controversy ignited by his adoring public erupted and the doctors had to write an editorial in the Times of Alexandria on December 19, 1799 defending themselves and bloodletting."[139]

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[135]Porter , p. 47.

[136] Schneeberg NG. A Twentyfirst Century Perspective on the Ancient Art of Bloodletting, Trans. Stud. Coll Physicians Phila., 2002 Dec; 24: 157-85, pp.168.

[137] Schneeberg NG, pp 173.

[138] Schneeberg N, pp. 170.

[139] Micheal L. Cheatham, "The Death of John Washington, An end to Controversy", *AM Surg*., 2008, Aug; 74(8):770-4.

> 'Broussaism', as medicinal leeching was called for a while, inspired the robes a la Broussais design, a paisley like depiction of the leech used to decorate the garments worn by women of society.[140]
>
> Sick and near death I was in the full sense of the word. I was seriously ill with an irritation of my whole nervous system, and the illness concentrated in the heart, producing a congestion of blood and inflammation that was barely suppressed by leeches and two bloodlettings.[141]
>
> Dostoevsky in a letter to his brother Mikhail (April 26, 1846)

In the nineteenth century, the attacks on bloodletting became bolder and more systematic. In fact, more than anything, the increasing interaction between laboratory science, empirical observation and statistics struck the heaviest blows on humoral theory and bloodletting. Statistics meant things could be measured now and bloodletting, cast under serious doubt, became one of the earliest medical case studies of statistics. In 1835, the French physician Pierre Louis after his meticulous statistical investigations over a control group and a group of patients who were bled stated that the use of bloodletting showed no significant therapeutic effects.[142] John Hughes Bennett, an Edinburgh physician, argued in 1855 that bloodletting merely reduced the strength of the patient and thus impeded recovery.[143]

Advances in medical science and pathology increasingly created a gap between theory and practice which pointed to a paradox and a helplessness well defined in the words of the Scottish physician and pathologist Matthew Baillie

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[140] Michalsen, p.9.

[141] K. A. Lantz, The Dostoevsky Encyclopedia, Greenwood Publication Group, 2004.

[142] Liakat Ali Parapia, "History of bloodletting by Phlebotomy", pp. 490-495.

[143] Davis and Appel, pp. 15.

(1761-1823): “I know better perhaps than another man, from my knowledge of anatomy, how to discover disease but when I have done so, I do not know better how to cure it.”[144] In the absence of any efficient new therapy and medication, the practice of bloodletting continued to be employed. Another factor contributing to the persistence of bloodletting probably is its accessibility and intuitivity which rendered it at once as high theory administered by physicians and doctors and as folk practice administered by the household party or the barber, thus enabling it to circulate on every level of society.

There were still some strong advocates of bloodletting who continued to perform bloodletting in heroic doses. Benjamin Rush (1745-1813), a signer of the Declaration of Independence, known as the American Hippocrates, resorted to massive amounts of bloodletting during the epidemics of yellow fever.[145]Bloodletting was also one of the main methods of treatment during the cholera epidemic of 1831.[146] “Lancet” one of the oldest and most prestigious English Medical Journals founded by Thomas Wakely in 1832 was named after the lancet, the standard instrument used for bloodletting.[147]

However, it would be in the hands of the French doctor Broussais, the professor of pathology in the French Academy of Medicine that bloodletting acquired a final flare before it took its place among the embarrassing brutalities of the early medicine. Broussais implemented bloodletting through the extreme use of leeches. During his cadaver studies, he took some normal post-mortem conditions as

[144] Porter, *The Greatest Benefit to Mankind*, pp.266.

[145] Porter, p.266.

[146] Parapia, , pp. 492.

[147] Davis and Appel, pp.12

pathological clues to conclude that all maladies came from gastroenteritis.[148] The therapy he saw most fit for this condition was sucking away the plethora accumulated in the intestines via bloodletting through the use of leeches. The leeches were placed on the belly of the patient to suck away the excess blood, coup sur coup to syncope. Broussais is known to have employed 10 to 50 leeches at a time, utilizing hundreds in his daily practice.[149] Leeches became the aspirin of the day, the spirit of the therapy being tagged as "hirudomania".[150] Broussais and his followers were called vampires, or more euphemistically as the most sanguinary physicians in history. Their opponents claimed that Broussais and his followers shed more blood than the bloodshed that took place during Napoleonic wars and the Revolution combined.[151] Napoleon, who himself had been venesected and survived, announced medicine as the science of murderers.[152]

The annelids came in various sizes from small to enormous. There were plenty of varieties classified according to their color like gray, green and dark leeches or classified according to the countries from which they came like the Hungary, Syria and Turkey. [153] Bordeaux supplied the largest leeches measuring ten inches in length and the Swiss leech was famous for the huge amount of blood it could suck. It was sold for five dollars per hundred in the late nineteenth century.[154] As French and England had exhausted their natural supplies, they had to turn to

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[148] Glasscheib, p.165.

[149] Mory, The Leech and the Physician, pp.881

[150] Schneeberg , pp.172

[151] Glasscheib, p.165.

[152] Parapia, pp. 492

[153] Michalsen, p.10

[154] Davis and Appel, p.35

Spain, Portugal, Italy, Bohemia, Hungary and the Balkans for import. By 1828 leeches became the most important article in the Materia Medica.[155] It is assumed that between 1827- 1836 the Paris hospitals alone used five to six million leeches and France's total demand approximated to thirty-three million leeches. Audrey Davis and Toby Appel state that "Broussais led to an increase of leech usage from about three million in 1824 to about forty one millions in 1833."[156] As the prices increased and as it was assumed that a shortage of leeches would largely reduce the ability to cope with the battle wounds, leech breeding and leech farms were financed by governments.[157]

The leeches were often kept in elegant and delicate porcelain leech jars contrasting profoundly with their reputation as 'disgusting and repulsive bloodsuckers'. Another way to counter this unpleasantness was resorting to the spirit of the nineteenth century to replace the natural with the mechanical. Mechanical leeches were invented and the most successful one was the brand '*Heurteloup'* named after the Frenchmen Charles Louis Heurteloup, sold in most late nineteenth century catalogues for as much as fifteen dollars.[158] This invention was followed by a mechanical leech for the even more "intricate and intimate" applications:"Dr. Reeses' Uterine Leech". [159]

In the second half of the nineteenth century the rise of the germ theory and the cellular pathology introduced by Pasteur and Koch and Virchow (1821-1902),

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[155] Michalsen,pp.10

[156] Davis and Appel, p.36

[157] Michalsen, pp.10

[158] Davis, Bloodletting Instruments, p.38.

[159] Davis, p. 38.

changed the understanding of disease forever and led to a profound bacteriophobia.[160] The use of leeches especially in hospitals dropped off dramatically as it was impossible to sterilize a leech without killing it.[161] By 1920's it became very difficult to obtain leeches.

The nineteenth century witnessed major epistemological changes with medicine being transformed from humanist learning to a laboratory science: When Emille Littre, the famous French lexicographer who is credited with the paternal embroidery over Hippocrates, started his edition of Hippocrates he thought he was working for his medical colleagues but by the time he finished his main contribution ended up being to his fellow philologists.[162]

Around the middle of the nineteenth century, with all the new and convincing data, many doctors felt that a scientific revolution had occurred.[163]This can be regarded as the absolute fall of the humors from medical understanding, leaving the stage to external stimuli: to microbes, bacteria and viruses.

Bloodletting did not cease abruptly after the fall of the humoral theory within which it was initially embedded, the practice continued for some time in a waning mode. During American Civil War, military doctors incapable of coping with widespread disease and infection resorted to large scale bleedings.[164]

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[160] Michalsen, p.10.

[161] Michalsen, p.10.

[162] Huisman ed., p.67.

[163] Huisman ed., p.67.

[164]Schneeberg , pp.175.

Obviously the absence of the therapy was sadly felt by some physicians as one commented in 1875 "we are now living in one of the periods when the lancet is still carried idly in its silver case, no one bleeds, and yet from the way in which I find my friends retain their lancets and keep them from rusting, I cannot help think that they look forward to a time when they will employ them again."[165]

In the first half of the twentieth century bloodletting no longer supported by any medical doctrine totally lost its previous prestige as a therapy against all ills and was prescribed only for a few specific diseases. Its less aggressive techniques like leeching and cupping continued to function, however largely within the folkloric practice.

Despite being the most repulsive of all the bloodletting instruments, the leech would succeed in opening a legitimate space for itself within the modern medical theory in addition to its secure place in the realm of the folkloric. In 2004 these annelids enjoyed a prestigious comeback after being approved by FDA as viable medical devices.[166] Today, leeches taxonomically termed as Hirudo Medicinalis are mostly used in plastic and reconstructive microsurgeries against venous congestions. In addition to the anti coagulant enzyme hirudin, it has been discovered that the saliva of the leech contains other enzymes that have anti-inflammatory, anti-oxidant and anti-biotic effects in the body.[167] Hence, as different from its earlier utilizations, modern medicine uses leeches for what they inject as well as for what they eject.

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[165] Schneeberg, pp.174.

[166] http://www.usatoday.com/news/health/2004-06-28-leeches_x.html (18.July.2010)

[167] Munshi Y., Ara I., Rafique H., Ahmad Z., 'Leeching in the History: A Review ' *Pakistan Journal of Biological Science*, pp.1652

CHAPTER III

THE HISTORY OF MEDICINAL LEECH IN THE OTTOMAN EMPIRE

The Terminology

> The sleeve that clothed his arm was filled with blood
> While on the sage a stark amazement sat
> But Mejnun spoke again:
> Be not amazed
> The fairy idol opened now a vein,
> The surgeon with his lancet cut her arm,
> So here the stigma of the wound appears.
> For though we own two bodies, yet the soul
> is one and jointly owned between us now
> Duality is merged in single state…
>
> Leila and Majnun[168]

In the Ottoman case, it may be the better to begin from the end. In the 1930s when both the Ottoman Empire and bloodletting therapy securely sank to the compartment of the 'pre-modern" in people's minds, Akil Muhtar wrote a general medicinal compendium called "Fenni Tedavi" (Scientific Therapy) which brought together all the lectures that he had given in the Faculty of Medicine.[169] At around 1904, after his graduation from the Medical School of Geneve, Muhtar had worked in the L'institut Pasteur which could be considered as the sanctuary of germ theory and microbiology and which can be regarded as one of the core institutions that gave shape to the new medical philosophy. Towards the end of his book, Muhtar has reserved a short section for bloodletting starting with the announcement of the therapies by then longstanding death: "In the past bloodletting method had been used

[168] Fuzuli, Leyla and Mejnun, UNESCO, İstanbul Marif Basımevi, 1959, p.159

[169] Akil Muhtar Özden, Fenni Tedavi: Tesirat-ı Edviye Dersleri, İstanbul: Devlet Matbaası, 1929, p.849-850.

as a therapy for almost all illnesses. However, since our general comprehension about the cause of illness has changed, we came to understand how wrong it was to bleed patients into an exhausted state and presently, the use of the practice has been limited to some specific cases."[170]

The text is important in terms of shedding light to the medical conception and the utilization of the terminology connected to bloodletting in the Ottoman Empire. Though the terms "fasd" and "hacamat" are often understood as synonyms, both denoting the act of bloodletting, Muhtar offers a more detailed definition of the vocabulary as part of medical terminology and makes an important distinction between the two terms: "Fasd" is used in Ottoman medical terminology to denote "saigneé" which describes the act of bloodletting in general. Muhtar splits bloodletting into two main branches; general *(umumi*) bloodletting and local (*mevzi)* bloodletting adding that "In order to perform local bloodletting (mevzi fasd), scarification (hacamat) and leeches are used."

Therefore, fasd often denotes general bloodletting, i.e. phlebotomy while scarification and the application of leeches are described as two alternative ways of local bloodletting. It would not be wrong to argue that his definition suggests transitivity between leeching and scarification that becomes most evident in the paragraph which explains scarification: "Oftentimes it (scarification) is used instead of leeching. Letting out a substantial amount of blood by scarification is a little fatiguing for the patient however, in terms of hygiene it is preferred to leeching."[171]

[170] Akil Muhtar Özden: (1877-1946)Educated at the medical school of Geneve. He was appointed to Civil Medical School of Istanbul and worked there as a lecturer till 1944. http://www.muslimheritage.com/topics/default.cfm?ArticleID=825.

[171] Akil Muhtar, Fenni Tedavi, pp. 849.

Redhouse defines “hacamat” as the art and profession of one who cups or scarifies often using a horn. The use of scarification with horn is the most referred to bloodletting method especially in nineteenth century sources. The person who scarifies is called “haccam” or “hicametçi”.[172] Redhouse also defines a special scarification mode called the “negro mode” of drawing blood which denotes scarification with the use of a razor.[173] Kamus-u Türki is more detailed in its definition of “hacamat”, giving information about the abandonment of the process alongside its implementation: “Scarifying a part of the body and drawing blood by a horn. The process had been popular in the past but is presently abandoned” [174]. The “present” used in the sentence must be more or less corresponding to 1317 (1899-1900) the publication year of Kamus.

Among this bloodletting vocabulary, “hacamat” expanded to include a highly popular slang utilization denoting the scarification of the opponent in street fights[175], which suggests a high circulation of the word in daily life. The word is also used in divan literature to denote the flowers that are of white and red petals.[176]

Pre-Modern Medicine

> Ata was one of the two poet doctors appointed by Bayazid II to the head of the asylum and was a personal doctor to the Sultan. Ata, as related by Hasan Çelebi used to prescribe aged wine for the humoral imbalances, pure wine for those who lost their minds to excessive accumulation of black bile and was himself making excessive use of the ‘remedy’.[177]

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[172] Redhouse, Turkish-English Lexicon, Constantinople, 1890, pp.764-765.

[173] Redhouse, pp. 1387.

[174] Şemseddin Sami, *Kamus-ı Türki,* 1317, pp.541

[175]Ferit Devellioğlu, *Türk Argo Sözlüğü,* Bilgi Yayınevi, 1970, p.157, p.236.

[176]Nahid Aybet, *Fuzuli Divanında Maddi Kültür*, Kültür Bakanlığı, 1989

Medical theories and practices of an Empire like the Ottoman Empire which extends and expands both diachronically and geographically are hard to trace. The vast distance that the Empire covered in time and space meant significant variations in climate, in water sources, in the plague modes, in the microbe fauna, in herbal flora and of course in cultural heritages and influences that created diverse medical systems and subsystems. However, in all this variety, it is possible to talk about three main building blocks of Ottoman medicine: religious/ prophetic medicine (tıbb-ı nebevî), folkloristic/ popular medicine and mechanistic medicine based on humoralism.[178]

Bloodletting was regarded as a viable and a popular method of therapy accepted by all of the above three medical categories. In the Ottoman world and in the larger Islamic medical framework, the practice operated free of the occasional resistance it met in the west especially from the Paracelsians and iatro-chemists due to the religious restrictions and ambiguities about blood or due to the pagan origins of the therapy. Bloodletting partially owes this freedom of action to the religious support emanating from the exemplar of the prophet himself as portrayed in the hadiths of Sahih-i Buhari.[179]

In the hadiths, bloodletting is defined as one of the three main methods of healing. The hadiths state that the prophet himself underwent the therapy

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[177] Hanife Koncu, "Klasik Türk Şiirinde Bazı Tedavi Yöntemleri", in the Proceedings of the 38. *International Congress on the History of Medicine*, 1-6 September 2002, Volume II edited by Nil Sarı, Ali Haydar Bayat, Yeşim Üman, Mary Işın,(Ankara 2005), pp. 685.

[178] Miri Shefer- Mossensohn, *Ottoman Medicine*: *Healing and Medical Institutions 1500-1700*,(New York: Suny Press, 2009), p.21-23.

[179] Konyalı Mehmed Vehbi, *Sahih-i Buhari Muhtasarı,* IV. Cild, Doğan Güneş Yayınları.
Sahih-i Buhari (b.810) is accepted to be most esteemed and pure book after Quran. It is the first of the six hadith books that brings about seventhousand hadiths together:
İslam Bilgileri Ansiklopedisi, Hikmet Neşriyat, İstanbul, 1993, p. 106-107 and 80-81.

implemented to him by an "eshab", denoting a committed follower from the close circle of the prophet, not necessarily somebody with a medical expertise. While the therapy is recommended for various cases ranging from headache to toothache, the humoralistic undertone becomes apparent for excess black bile is presented as the cause of leprosy which according to hadiths also fell into the therapeutic domain of the procedure. It is however the head that is claimed to be the most beneficial organ to be bled and the middle part of the prophet's head was scarified to relieve the distressing headache that caught him somewhere between Mecca and Medina.[180] It is also claimed that the prophet set the seventeenth, nineteenth and the twenty-first days of the month as the days in which the patient would find cure for all ills were he to let blood.[181]

Thus acquiring the religious legitimacy, bloodletting was further integrated into the Ottoman therapeutic structure by the "learned/academic medicine". The infrastructure of Ottoman medical system was by and large borrowed from Anatolian Seljukids.[182] An institutional continuity is observed between the old Anatolian Seljukid hospitals together with their charitable foundation systems and the Ottoman medical institutions.[183] In terms of the focal medical theory and practice; however, Ottomans followed the larger framework of Islamic medicine which occupied a prestigious place throughout the ninth to fifteenth centuries. Ali Haydar Bayat, in his

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[180] Konyalı Mehmed Vehbi, p.308.

[181] Konyalı Mehmed Vehbi,, p.307.

[182] Sabahattin Aydın, " Osmanlılarda Sağlık, Modern Tıp Penceresinden Osmanlı Tıp Anlayışına bir Bakış", in *Osmanlılarda Sağlık*, edited by Coşkun Yılmaz, Necdet Yılmaz ed, İstanbul: Biofarma , 2006, p.28.

[183] Süheyl Ünver, *Osmanlı Türklerinde Hekimlik ve Eczacılık*, (İstanbul: Hüsnü Tabiat Basımevi, 1952), p.3.

book 'History of Medicine'[184] considers a basic understanding of humoral pathology indispensible if one is ever to make any sense the out of the Classical Ottoman Medicine. It would, however be an over reductionism to relate the humoral knowledge and bloodletting practice of Ottomans entirely to the Islamic translations and heritage as, although not well documented, other influences like Byzantine and shamanistic traditions must have also played an important role.

In the pre-modern period, medical knowledge was generated and diffused mainly through the educational institutions called the "madrasah". The most important school in terms of medicine was the Süleymaniye Complex (1556) which included the first and only medical madrasah together with its practice hospital.[185] The second main institution was the hospitals called "darüşşifa" where the apprentices were brought up by master doctors, an education which must have provided intense opportunity of practice alongside theory.[186] Evliya Çelebi for example stated that he gave lessons on medicine twice a week as a permanent staff of Fatih Darrüşşifa and that he gave lessons in Manisa Darrüşifa in Edirne hospital.[187]

Another widespread way of becoming a medical expert was through auto-didaction complemented by private lessons taken from esteemed masters of the discipline.[188] The most common method of reading oneself into being a doctor was

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[184] Ali Haydar Bayat, *Tıp Tarihi*, (İzmir, 2003), p. 98-101

[185] Ali Haydar Bayat, "Osmalı Devletinde Tıp Eğitimi", in Osmanlılarda Sağlık, ed. C.Yılmaz, N. Yılmaz, *Osmanlılarda Sağlık*,(İstanbul: Biofarma, 2006), p.241.

[186] Esin Kaya, Ayşegül D. Erdemir, Bilimin Işığında Osmanlıdan Cumhuriyete Tıp ve Sağlık Kurumları, Türkiye (Diyanet Vakfı Yayınları:Ankara 2000), p.86.

[187] Necdet Yılmaz ve Coşkun Yılmaz, "Evliya Çelebi'nin Seyahatnamesine gore Osmanlılarda Sağlık Hayatı", in *Osmanlılarda Sağlık*, edited by C.Yılmaz, N. Yılmaz, *Osmanlılarda Sağlık*, (İstanbul: Biofarma, 2006), p.343-359.

[188] Mossensohn, p.142 and Ali Haydar Bayat, "Osmalı Devletinde Tıp Eğitimi", p.237-244.

by means of a large genre of Turkish medical books usually written in plain and simple vernacular. The tradition of writing medical works in Turkish, which began in the fourteenth and fifteenth centuries, continued all through the Ottoman medical history.[189] The use of the vernacular must have rendered the medical knowledge accessible to a larger population rather than making it the exclusive commodity of the Arabic-Farsi speaking intellectual elite and contributed to the supply of doctors by providing an easily available source of education.

Furthermore, these books constitute by far the most important and revealing sources in giving meaning to the framework and fundamentals of the core medical theory operating in the pre-modern Ottoman world. The first medical books in Turkish were written in fourteenth century by famous medical men like Hekim Bereket, Murat b. İshak Cemaleddin Aksarayi and Hacı Paşa[190]. Other medical books written in Arabic or Farsi were generally commentaries (şerh) to famous Islamic medical works, especially to "Kanun". All of these books were written through humoral framework (Ahlât-ı Erba'a) and the cause of illness was generally understood as the imbalance of the four humors (hıltlar: kan, safra, balgam, sevda) and four temperaments (demevî, safravî, balgami and sevdavî). Thus, bloodletting appears in these books as a frequently prescribed therapy to restore the balance of the human machinery and temperament.

The fifteenth and sixteenth centuries did not bring about any changes to the general understanding of medicine and healing of these books which continued to

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[189] Nil Sarı, "The Paracelsian Influence on Ottoman Medicine in the Seventeenth and Eighteenth centuries", Available[Online],http://www.muslimheritage.com/topics/default.cfm?TaxonomyTypeID=11&TaxonomySubTypeID=56&TaxonomyThirdLevelID=-1&ArticleID=1084.

[190] Kahya and. Erdemir, p.98-100.

depend heavily on humors. An example to this genre would be Müntehab fi't-Tıb [191] written by Abdülvehhab bin Yusuf ibn-i Ahmed el- Mârdânî in the first half of the fifteenth century. "Müntehab"[192] denotes a compilation formed by the selection of important medical principles from among the pool of distinguished Arabic- Persian medical accumulation. It is possible to say therefore that the transfer of medical knowledge was not an entirely passive process of translation but also included the more 'subjective' process of selection. It would be interesting to know which parts Arabo-Persian heritage were taken, which were left out or if/how they were adapted to fit into Ottoman medical requirements.

Sometimes through the Ottoman medical works it is possible to directly glimpse the Greco-Roman heritage amidst the later layers of accumulation. Yusuf ibn-i Ahmed el-Mârdânî , for example, quotes from Hippocrates (Ebukrat) relating his statement promoting phlebotomy, both in winter and in summer, as the best cure for dropsy.[193] There is still a folk belief that lingers in İstanköy that a huge plane tree dates to the lifetime of Hippocrates and is found where he lived.[194] This could be a late fabrication for touristic attraction but alternatively a general recognition of Hippocrates might have existed back then at a folk level as some of the knowledge contained in these books often find a way to filter down to folk level through subgenres like the word of mouth or storytelling.

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[191] Abdülvehhab bin Yusuf ibn-i Ahmed el-Mârdânî, Kitabu'l-Müntehab fi't-Tıb (823/1420) , edited by Ali Haydar Bayat, (İstanbul: Merkezefendi Geleneksel Tıp Derneği, 2005).

[192]The dictionary meaning of müntehab is selection of the eminent
Ahmed el- Mârdânî explains the structure of his book : Ali Haydar Bayat, Abdülvehhab bin Yusuf ibn-i Ahmed el-Mârdânî , Kitabu'l-Müntehab fi't-Tıb, p.13

[193] Yusuf ibn-i Ahmed el-Mardani, 105b, pp.424

[194] Bekir Karlığa, Aykut Kazancıgil," Hipocrate Aforizmalarının Arapça ve Türkçe Tercemeleri", Tıp Tarihi Araştırmaları, *History of Medicine Studies*, edited by Hüsrev Hatemi, Aykut Kazncıgil, (İstanbul, 1996), pp. 88

Other examples to medical books in Turkish are Yadigar written by Tabib İbn-i Şerif assumed to be written in the fourteenth century,[195] Müntehab-ı Şifa written by Celalüddin Hızır (Hacı Paşa) at the end of the fourteenth century, although this date is also controversial.[196] Kitabü'l Mühimmat, another popular medical work is thought to be written in the fifteenth century but the author is incognito.[197] The sixteenth century manuscript, Cerrahiyyetü'l- Haniyye written by Şerafeddin Sabuncuoğlu has a different status than the other above mentioned medical books with its concentration on surgical procedures and with numerous miniatures to illustrate the procedures.

In general, these books remind the reader how blurred the line between the 'folk medicine', 'religious medicine' and 'learned medicine' was and how comfortably they overlapped with each other as obviously their authors did not have bold and consistent demarcation lines separating these realms. These medical authors generally describe the cause of illness basing their views on detailed observations on the anatomy[198], pulse and fever of the patient and proceed to deduce analytically the prognosis and the required therapy in the framework of humoral paradigm. However, now and then, they recommend a certain prayer to be recited for a certain number of times, a certain phase of moon to wait for, or a concoction that include weird

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[195] Tabib İbn-i Şerif, Yadigar: 15. Yüzyıl Türkçe Tıb Kitabı, İstanbul, Merkezefendi ve Halk Hekimliği Derneği, haz. Ayten Altıntaş, M. Yahya Okutan, Doğan Koçer, Mecit Yıldız, (İstanbul: Yerküre, 2004), p.27.

[196] Celalüddin-i Hızır, *Müntehab-ı Şifa*, ed. Zafer Önler, (Ankara: TDK Yayınları, 1990).

[197] Saadettin Özçelik, Kitabü'l Mühimmat,(AKM Yayınları, Ankara) 2001, pp.8.

[198] Of course at this point we are not talking about accurate anatomical knowledge, the Islamic anatomical data generally followed Galen who had his anatomical knowledge mostly through the dissections of pigs and therefore made many errors. It would be De Humani Corporis Fabrica written by Vesalius which would introduce accurate anatomy for the first time. In the Ottoman Empire modern anatomy was introduced by Sanizade in the nineteenth century.

‘organic chemicals’ like the blood of the snake or the urine of the horse as part of the therapy.

The books generally resemble each other in their structure which is based on major selections subdivided into paragraph long articles defining an illness and sometimes its causes followed by the required therapies and remedies. The therapies are by and large based on herbals complemented by phlebotomy, scarification, cupping, leeches, enemas and purges.

In terms of bloodletting, these books do not exhibit fundamental differences: the methods of application, the illnesses the therapy is prescribed for, the preconditions that should be considered and bloodletting points are more or less similar. This is not surprising considering that they more or less draw from the same resources. These books, however, make a clear distinction between fasd and hacamat, generally recommending hacamat which collects less blood in cases when the more effective fasd is not possible or necessary. Fasd is recommended for the sanguine types who consume food in large quantities. For a certain kind of illness fasd can be prescribed to adults while for children and the weaker constitutions less invasive hacamat is seen fit. The most appropriate veins for fasd are located in the arms, while the most appropriate ones for hacamat are located in the calves. Both ways of letting blood are recommended especially in the beginning of the summer, but not in winter as in winter every kind of evacuation therapy is regarded as unfavorable. It is assumed that the illnesses that were of hot temperaments were caused due to the accumulation of black bile and plethora (*ihtikan*) and that plethora often occurred in the veins of the head. Just like the hadiths, fasd and hacamat from the veins of the head, is commonly prescribed. The bloodletting therapy is recommended both in the format of fasd and hacamat for a wide range of illnesses

from leprosy to baldness and urtikaria; fasd being the most commonly prescribed among all the other methods.

It is highly interesting that leech therapy is referred to only very few times in most of the medical literature and the mention of the leech is restricted almost exclusively to articles about the methods of detachment, especially in cases of attachment to the improper parts of the body or in cases when the annelid slides down. Kitabu'l-Müntehab fi't-Tıb recommends the use of a tool called "demrenkeş"[199] to get rid of the runaway leech, others offer remedies like drinking or applying mouthwash that are prepared from acidic substances like vinegar, garlic and mustard.

The very infrequent mention of leech relative to the abundant prescription of phlebotomy and scarification raises one of the main questions about the utilization of leeches as also triggered by an article published in the newspaper Constantinople on the fifteenth of June in 1852, written by the European correspondent of New York Times.[200] The article opens by emphasizing the highly popular utilization of the leech in the west around the mid- nineteenth century: "Our readers who have had their blood drawn by these slimy monsters (and who has not?) will need no apology for the insertion of the following sketch taken from the European Correspondent of the New York Times."[201]

[199]Abdülvehhab bin Yusuf ibn-i Ahmed el-Mardani, Kitabu'l-Müntehab fi't Tıb, d. 91b 6, p.116.

[200] J. D. B. De Bow, De Bow's Review of Southern and Western States, v.13, v.313 of American Periodical Seies 1800-1850, p.300-301

[201] J. D. B. De Bow, "The Trade in Leeches" in *De Bow's Review of Southern and Western States*, v.13, v.313 of American Periodical Series 1800-1850, Princeton University, transferred to digital environment on 11 June 2008, p.300.

The author of the article states that the demand for leeches has reached Turkey and that it is enormous both in domestic and foreign use. He then asserts that it had been a custom of Turkish people to be bled once a year at least especially in spring. However, he adds that the process was carried out by the barber of the public bath by scarifying and then drawing blood with a horn, repeating the exact definition of scarification given in Kamus-ı Türki. Subsequently he claims that the custom of Europeans, meaning the use of leeches in bloodletting instead of scarification, have gained more and more popularity among the Ottomans and adds: "as they (Turks) see the avidity with which leeches are sought for in commerce, they also began to use them sick or well".[202]

Considering the above information and the infrequent mention of leech in the medical books and no mention of it in the hadiths in contrast to the highly recurrent use of fasd and hacamat, one suspects about the popularity of leeches as a bloodletting instrument in pre-modern Ottoman medicinal use.

However, Cerrahiyyetü'l- Haniyye gives a clue of the status of leech therapy among the bloodletting methods through the introduction of two new surgical instruments that are quite different from the lancet, the standard device of letting blood in the west .The manuscript is interesting as it brings some original approaches to the almost standard bloodletting procedures. Sabuncuoğlu's approach seems to be a creative in combining the bloodletting procedure with cauterization on which he seems to be specialized and which is the main theme of his book. Sabuncuoğlu introduces an instrument of phlebotomy and two instruments of scarification. The

[202] J. D. B. De Bow, "The Trade in Leeches" in *De Bow's Review of Southern and Western States*, v.13, v.313 of American Periodical Series 1800-1850, Princeton University, transferred to digital environment on 11 June 2008, p.300.

instrument he introduces for scarification is called "mıhcama" that has two models.[203] One model is for normal scarification and the other version is for bloodless scarification. Bloodless scarification which seems to be almost a version of cauterization is to be applied to patients with thick skins as "it is better to "joggle the fats" of these people rather than letting their bloods". [204]

Sabuncuoğlu has devoted a small section to leeches in "Cerrahiyyetü'l-Haniyye". Similar with the majority of the medical books of his time, rather than prescribing leeches directly for diseases, he too focuses on the attachment/detachment procedures and problems, hygienic precautions and on the methods to stop bleeding once the leech was detached.[205] However, Sabuncuoğlu gives an important clue about the utilization of leeches stating thet the annelids would be used in the parts of the body which were too small, angular or fleshless for the scarification instrument (mıhcama) to operate.[206]

Although the use of leech is taken for granted as understood by the above precautions against the improper attachments, there are very few cases of direct

[203] Şerafeddin Sabuncuoğlu, Cerrahiyyetü'l- Hanniye, Yazma Eserler Kütüphanesi, Ali Emiri,,95. Fasıl
He calls the phlebotomy tool "ettiba fasd" and explains the implementation: "You put the mouth of the instrument on the vein and then hit it with your hand or another object till it bleeds…the tip of the instrument should not be too pointy, it should penetrate the vein and yet not get into the bone". Likewise he warns the user of etibba fasd to be careful not to penetrate the nerves lying under the veins.

[204] Şerafeddin Sabuncuoğlu, Cerrahiyyetü'l- Hanniye, Yazma Eserler Kütüphanesi, Ali Emiri,96.fasıl,2. bab. ...Strech your index finger and middle finger and that is how wide the mouth of the instrument should be. And its length should be half a handspan. Next to it, in the middle there should be a little hole, a measure that a needle would fit. This "mıhcama" should be made of tile or copper. Not to hurt anybody during scarification, its side should be thickish and glazed. And in the middle ... the connecting part (*kibürcek*) should be made of copper or iron and there should be a little hole in the middle of this part to insert a candle. ...The flaming part of the candle should be towards the bottom of the "mıhcama". If the head of the candle looks downwards the flesh might burn."

[205] Şerafeddin Sabuncuoğlu, Cerrahiyyetü'l- Hanniye, Yazma Eserler Kütüphanesi, Ali Emiri,97. Fasıl 2. bab..

[206] Şerafeddin Sabuncuoğlu, Cerrahiyyetü'l- Hanniye, Yazma Eserler Kütüphanesi, Ali Emiri, , 97. Fasıl, 2.bab (158 a)

prescription of the leech to any illness except for baldness and body aches.[207] Either leech utilization was not as popular as the other two most common methods of bloodletting in the high medicine, i.e. phlebotomy and scarification or they were used as an extension or subcategory of scarification in the special locations of the body where lancet or mıhcama could not operate. The former approach then would include a potential for leech therapy in most of the scarification prescriptions.

Apart from the books, the presence of bloodletting therapy can be tracked from the medical institutions and personnel. In the Ottoman State the core medical professional group was comprised of physicians, surgeons who were regarded as inferior to physicians and eye doctors (kehhal).[208] Evliya Celebi, in his Seyahatname includes a medical specialist called "fassadan-ı cerrah-ı üstadan", "cerrahan-ı fassadan" or "fassad-ı amil" which could be translated as phlebotomist-surgeon among medical personnel of some of the hospitals.[209]

However apart from the rather academic and "institutional" medicine, there was also the peripheral medical service group comprised of circumcisers, blood letters, rupturers (fıtıkçı), bone-setters, barbers, herbalists (attar) and pharmacists. These people worked outside the range of hospitals and madrashas and were often auto-didacts or refugees from other countries. They might have offices or they might work as peddlers in bazaars.[210] There are some royal decrees (ferman) and parts in

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[207] Tabib İbn-i Şerif, Yadigar, 242 b, pp.328.

[208] Ayten Altıntaş, Hanzade Doğan, "Osmanlı'da Serbest Hekimlik Yapan Esnef Tabib", in *Osmanlılarda Sağlık* edited by C.Yılmaz, N. Yılmaz, *Osmanlılarda Sağlık*,(İstanbul: Biofarma, 2006), p.265.

[209] Necdet Yılmaz, Coşkun Yılmaz, "Evliya Çelebi'nin Seyahatnamesi'ne Göre Osmanlılarda Sağlık Hayatı ", ed. Coşkun Yılmaz, Necdet Yılmaz in *Osmanlılarda Sağlık*, Biofarma, İstanbul, 2006, pp.343-359

[210]Altıntaş, Doğan, p. 267.

Kaşifi's Fütüvvetname which gives information about these peddling "medical" people calling out to their potential customers (hengame kurmak) in bazaars.[211] Ayten Altıntaş and Hanzade Doğan in their article "Private Medical Practice in the Ottoman Period", portray how the peddlers might have operated in the bazaars basing their account on the above sources: "It is understood that that this group formed a shop by lying rugs on the ground and calling out to public under the little tents made of kilims."[212] Apart from this rather sedentary form of peddling, a miniature in Surname-i Vehbi depicts a mobile barber serving his customer on his little and rather elegant shop on wheels probably transported by mules, donkeys or horses. [213]Osman Şevki Uludağ, in his article about the medicinal use of leeches informs that there were street peddlers that sold leech, further diffusing the circulation of the materia medica into the petty streets and little neighborhoods of the city: "Today, one can no more hear the noise of the peddlers that call out "leeches".[214] However, in order not to make an anachronism, it is important to note here that Osman Şevki wrote this article in 1930 relating the memories of his lifetime. It is possible that either leech peddling had been an ancient custom or alternatively peddling might have been articulated into the system to meet the increasing demand caused by the leech craze of the nineteenth century.

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[211] Altıntaş, Doğan, p. 267.

[212] Altıntaş, Doğan, p. 267.

[213] Surname-i Vehbi, TSMK, III, Ahmed, nr. 3593, vr. 75b.

[214] Osman Şevki Uludağ, *Tıb Tarihimizde Sülük Hekimliği*, Dirim, Ağustos-Eylül, 8-9, p.1-3

Tıbb-ı Jadid

> Another influence of the Paracelsian medicine is the integration of philosophy, astrology and secret sciences mixed with theology into medical literature which could have been identified as secular before Tıbb-ı Jadid.[215]

The echoes of the first serious blow to humoral pathology reached the Ottoman medical world in the seventeenth and eighteenth centuries creating a current of modernity in medicine tagged as Tıbb-ı Jadid.

Seventeenth and eighteenth centuries are generally regarded as periods of stagnation and regression in science and medicine associated with the larger political and military frame of the Empire.[216] However, Tıbb-ı Jadid period might be evaluated as a period of fresh curiosity, a spirit of exploration and opening up and an as an effort of adaptation to change. It is a period of analyzing the western medical accumulation systematically while continuing to draw on from the classical accumulation, making use of both currents in practice. The new medical theories and the old medical theories existed side by side without much dispute, and complemented each other practically. Furthermore this period probably also acted as a foundation for the nineteenth century when medical understanding of the empire completely turned its direction and attention westward.[217]

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[215] Nil Sarı, "The Paracelsian Influence on Ottoman Medicine in the Seventeenth and Eighteenth centuries", Available [Online] http://www.muslimheritage.com/topics/default.cfm?TaxonomyTypeID=11&TaxonomySubTypeID=56&TaxonomyThirdLevelID=-1&ArticleID=1084 (7 .04.2010).

[216] Sabahattin Aydın, p.30.

[217] Salim Aydüz, *Onsekizinci Yüzyıl Osmanlı Tıbbında Değişim: Doğu Tıbbından Batı Tıbbına Geçiş Üzerine bir Deneme*, in the Proceedings of the 38. International Congress on the History of Medicine, 1-6 September 2002, Volume II ed. by Nil Sarı, Ali Haydar Bayat, Yeşim Üman, Mary Işın, (Ankara 2005), pp. 689.

The foremost introducers of Paracelsus were Salih bin Nasrullah (d. 1699) Ömer Sinan al İzniki (eighteenth century), Omer Shifai (d. 1742) and Gevrekzade Hasan Efendi. According to Nil Sarı the major impact of Paracelsain influence is the change in the philosophy of medicine that was largely based on humoral pathology theory.[218] Paracelsus did not deny the role of four elements in illness and health, but diminished their importance by introducing three principles in organs: combustibility, volatility and incombustibility which he calls as sulphur, mercury and salt.[219]As was covered in the first part, the Paracelsians and the later iatro-chemists were generally opposed to bloodletting, they beleived that the practice shortened the life of the patient and that it was against Holy Scripture which defined blood as the locus of soul and the source of life energy. However, they took the leech theraphy out of the package of bloodletting methods of bloodletting. They regarded medical leeching indispensible as it was a remedy of the nature and as it did not cause 'asthenia', a frequent complication of venesection and cupping.[220]Due to the limitation of sources, the impact of this approach among the utilization of leeches in high medicine requires further inquiry.

This transformation in the main philosophy together with the increasing influx of European doctors into the "well protected domains" was of course not completely unproblematic at the level of the daily/social life and the stately control of it. In the first years of Ahmed II's reign, the new therapies, the increasing practice of

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[218] Nil Sarı, http://www.muslimheritage.com/topics/default.cfm?TaxonomyTypeID=11&TaxonomySubTypeID=56&TaxonomyThirdLevelID=-1&ArticleID=1084.

[219] Nil Sarı, http://www.muslimheritage.com/topics/default.cfm?TaxonomyTypeID=11&TaxonomySubTypeID=56&TaxonomyThirdLevelID=-1&ArticleID=1084.

[220] Michalsen, , p.7

European doctors, together with their incompetency created medical problems that reflect themselves through the royal prohibitions ordered for some doctors as can be observed in some archival documents. The uneasiness is further reflected through rumors and cases of prostitution which took place in Muslim and non-Muslim medical shops around Galata, Üsküdar and Eyüp and which are recorded in the proceedings of the Üsküdar court from the year 1140 (1728). [221]

The control mechanism of the state over the medical enterprise was mainly based on the "gedik" system that regulated the doctors, surgeons, pharmacists by setting a quota to the number of people that would work in these sectors. If a certain doctor died or left the practice, to acquire office, the new doctor had to wait for a "gedik" (actually meaning a gap) to be available by the death or cessation of the ones in practice. The permission and license to open a medical shop was secured from the "hekimbaşı"(head-physician) who can be compared to the minister of health today with the additional responsibility as the head of the General Staff of Health Office[222]. The "gedik" system was abolished in 1860.[223] Alongside the licenses, the check mechanism of the central authority was regulated by a kind of municipal police called "muhtesib". Muhtesib played a great role in the control of licenses and supervision of medicine in the daily practice, acting as intermediaries between the state, the medical authorities, doctors, peripheral medical sector and the people.[224]

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[221] Aydın, p.36.

[222] Aydın,,p..32

[223] Aydın, p.35

[224] Aydın, pp. 30-35

The madrasah system together with the darüşşifa hospitals were largely insufficient[225]in supplying the medical needs of a large population and even more so if the military medical need is subtracted from the overall supply of physicians and surgeons. Therefore in spite of these controls it is not hard to imagine the busy unlicensed sector of foreign, Muslim, non-Muslim doctors, surgeons and intermediaries outside the "gedik" system complemented by the peripheral medical sector operating busily to meet the demand of a large population.

Another location of peripheral health- service was the hamams. As M. Thevenot who has visited Ottoman Empire observed, The Turks went to hamam to keep their health as well as getting clean.[226] Especially in places where medical institutions were nonexistent or few, hamam emerged as a place for minor therapies and even self-treatments. The medical menu of the hamam included scarification for common cold and leeching for the pain in the legs.[227] This function of the hamam seems to continue well into the twentieth century as stated by Uludağ: "until about twenty years ago, large amounts of blood was let in our hamams…blood clots merged with lather used to flow over the white marbles of the hamams like filthy rivers… in every bath of Bursa it was possible to find a blood letter. They used to let blood with horns and attached leeches." French traveler Thevenot who toured the Ottoman Empire in the 1670's documented cases he saw of people bleeding themselves without resorting to any institution or medical intermediary.

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[225] Osman Şevki Uludağ, ,p.1.

[226] Mossensohn, p.277.

[227] Mebrure Değer, Treatment in the Turkish Bath (Drugs, Medicines, Methods),ed. Ayşegül Demirhan Erdemir, Öztan Öncel, Yusuf Küçükdağ, Berrin Okka, Sezr Erer in I. International Congress on the Turkish History of Medicine, 10. National Congress on the Turkish History of Medicine Proceedings Book, (20-24 May, 2008), Vol II, pp..1975-1981.

The Eighteenth Century

> If a person adds vinegar to his food, an angel appears on his side remaining there and praying for that person till the end of the meal.[228]
>
> Hacamat Risalesi

The eighteenth century medical book of Dağıstanlı Mehmed Efendi is kind of a crossbreed reflecting the new chemical principles and the western medical liaisons while keeping its main framework based on humoral pathology. Bloodletting as a remedy is much less prescribed and generally fasd softens into hacamat while new medical gizmos like sulphur and mercury appear on the medical texts as most effective remedies. The western medical encounter can also be traced from the appearance of a new materia medica which Mehmed Efendi calls the salt of "Viş". Mehmet Efendi informs his readers that this salt was being imported from the Vichy thermal spring located in France in sealed jars and could be obtained from pharmacists. [229]

The late seventeenth and eighteenth century also created a literature of Bloodletting Booklets[230] (Hacamat Risaleleri), scarification booklets, which contain short, practical knowledge that is written in rather a dogmatic, assertive and dictating format; reminding mostly the Talmudic writings on bloodletting. The provided

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[228] " bir kimesne sirke ekl eylese ol kimsenin başı ucunda bir melek ta fariğ-i ekl oluncaya değin ol kimesne için Allah_ı bi-zevalden mağrifet taleb eyler"
Muhammed bin Mahmud, *Fasd ve Hacamat Risalesi*, Süleymaniye, Bağdatlı Vehbi Efendi, 001441, 1171.

[229] Dağıstanlı Mehmed Efendi, *Dağıstanlı Mehmed Efendi'nin Geleneksel Tıp Yazması,* ed. Uğurol Barlas,Tıp Tarihi Araştırmaları,(İstanbul: Hilmi Barlas Eğitim Vakfı, 2005), p.139.

[230] Mehmed Halim bin Abdullah, *Risale-i Hacamat,* Süleymaniye, H. Hayri Abdullah Efendi, 000053.
Osman bin Musa, *Risale-i Hacamat,* Süleymaniye, Tırnovalı, 001386, 1277.
Muhammed bin Mahmud, *Fasd ve Hacamat Risalesi*, Süleymaniye, Bağdatlı Vehbi Efendi, 001441, 1171.
Osman bin Musa Eskişehirli, Risale fi'l- Hacamat, Süleymaniye, Hacı Mahmud Efendi, 005585.

medical data is legitimized through hadiths and those who betray hadiths are in more than one case threatened with acquiring "baras" disease (albino) as a punishment.[231] The booklets follow a similar pattern and they are almost a repetition of each other. They start with the hadiths on bloodletting and then summarize the therapy in three or four short chapters. The first part concentrates on the necessity and benefits of the therapy, the second part on the before and after diet that should be adopted, the third on the religiously appropriate (caiz) days of implementation and fourth on points of scarification. It is noteworthy that the popular custom of bloodletting in hamams is prohibited in these books as being potentially lethal.

In the second part, it is stated that bloodletting should not be performed on Saturdays, neither Wednesdays nor Fridays whereas Mondays, Thursdays and Sundays are stated to be appropriate for the therapy while Tuesdays remain controversial. Talmud is another source that dictates appropriate days for bloodletting and these days are almost the exact opposites of the ones that are dictated in these booklets: While Talmudic bloodletting is proper on Sundays, Wednesdays and Fridays, it is prohibited on Mondays or Thursdays.[232] The booklets also state that the therapy should be implemented after the new moon. They recite the hadith that a person will find a cure for all illnesses if he were to be scarified on the seventeenth, nineteenth and twenty-first days of the month.

It is noteworthy that in the eighteenth century when the influence of the western medicine was increasingly felt, such a religious understanding of medicine found voice and expression in these bloodletting booklets. We can say that

[231] Osman bin Musa Eskişehirli, Tıbb-ı Nafi, Süleymaniye Kütüphanesi, Hacı Mahmud Efendi Kısmı, Nr. 5585.

[232] Rosner, p.168.

bloodletting and leeching were modernities of the early pre-modern-medicine. They enjoyed a mainstream scientific legitimation as part of the humoral pathology theory transferred from the prestigious Arabic- Farsi accumulation. However, after Paracelsus and the rise of a chemical understanding and mechanistic approaches, humoral pathology rapidly became a part of the old/classical medicine. Bloodletting was much less prescribed and was not necessarily associated to humoralism. It was the new chemicals like sulphur, mercury or salts that were generally accepted as the modern gizmos. The existence of such a "conservative" medical literature advertising bloodletting in a period when the Empire gradually turned its focus to west and as the "new medicine" increasingly infused into Ottoman theory and practice, might also be read as a statement of reaction in the face of the change towards west.

Nevertheless the existence of such "conservative" medical literature alongside the translations from highly important western medical authors like Hermann Boerhaave (1688- 1738)[233] on the commission of the Sultan is another example to the variety of medical understandings and literature that cohabit in the eighteenth century.

The Nineteenth Century

> [S]o it was in these three days at Breslau this Koch put a sword of Excalibur into the hands of men, with which to begin the fight against their enemies the microbes, they fight against lurking death; so it was that he began to change the whole business of doctors from a foolish hocus-pocus with pills and leeches into an intelligent fight where science instead of superstition was the weapon.[234]

[233] "Domestic diagnosis and Treatment of Illness" is translated by Abdülaziz Efendi on the comission of Sultan Mustafa III.

[234] Paul de Kruif, Microbe Hunters, (London:Harcourt Brace& Company, 1926, p.118.

The making of the nineteenth century Ottoman medical modernization of medicine is generally clustered around a few names and it is often argued that the 'old medicine' finally came to an end with Şanizade Ataullah Efendi's Mir'âtü'l-ebdân fi teşrîhi a'zâi'l-insan (1819-1820). In fact the first noteworthy book on anatomy "Risale-i Teşhir-i Ebdân" had been written back in the seventeenth century by Şirvanlı Mehmed İtaki Efendi. The illustrated book was largely based on Avicenna's anatomy combined with the influence of Vesalius and of some other western sources.[235] Mehmed Ataullah was a polymath who had deep interests in literature, history, math and other areas of science alongside medicine. He is the author of "Hamse-i Şanizade" compiled of five books: "Mir'âtü'l-ebdân fi teşrîhi a'zâi'l-insan", "Usulü't tabia", "Mi'yâru'l-ettıbâ", "Kanûnu'l-cerrâhîn" and "Mizânü'l-edviye".

Şanizade is a graduate of Süleymaniye Madrasah and is said to have a good understanding of Italian, French, Farsi, Arabic and Greek.[236] He had been a member of the academic/scientific circle 'Beşiktaş Scientific Community' also known as the "Ortaköy Yaranı" which cost him an exile to Tire as his community was associated with the Bektaşi Mystical Order.

Şanizade is regarded to have constructed a bridge between the old medicine and the new medicine. In Mi'yâru'l-ettıbâ, Şanizade recommends bloodletting especially in specific cases like the initial phase of pneumonia and infections.[237] He prescribes bloodletting and use of leeches for children in cases of teething accompanied by swelling and fever: "…Sometimes all of the above advised

[235] Aykut Kazancıgil, Bedizel Zülfikar, *XIX. Yüzyılda Anatomi*, (Istanbul: Özel Yayınlar, 1991) , p.1.

[236] Bedizer Zülfikar,*Şanizade*, Yüksek Lisans Tezi, Cerrahpaşa Tıp Fakültesi, Deontoloji Anabilim ve Tıp Tarihi Bölümü, Dan: Nil Sarı, 27.7. 1986, pp.18

[237] F. Kelestimur, A. Kamil Cihan, A. Sevgi, T. Sakallı, *Miyar'ul Ettıba in Şanizade Ataullah Efendi*, Erciyes Üniverstesi Gevher Nesibe Tıp Tarihi Enstitüsü, Yayın no:5

medication will not work, fever and dehydration will increase, eyes will get red, spasms and eclampsia will ensue. Then it is necessary to let blood or more practically to attach leeches behind both ears. Sanguine children with full veins or those who display very aggressive symptoms accompanied by perpetual fever will require many bloodlettings or sometimes attachment of the leech." [238]

As Şanizade introduced modern anatomy, modern physiology was introduced by the translations of Hekimbaşı Behçet Efendi (1774-1816) who together with his brother Abdülhak Molla are other famous figures associated with the beginnings of nineteenth century medical transformation. Hekimbaşı Behçet Efendi's efforts of change in medicine are highly fundamental. He did not limit himself with the theory and practice of medicine but acted from an institutional level with the advantage of his status as the head physician of the Empire. He is the founder of the Şehzadebaşı Medical School and the quarantine organization. Behçet Efendi's and his brother's medical interests and curiosities were however not limited with the modern west. Behçet Efendi is the author of the book Hezar Esrar (A Thousand Mysteries) which is completed by his bother Abdülhak Molla and niece Hayrullah Efendi after his death.[239] Hezar Esrar is published in 1869 and seems to have to have reached to a large public.[240] It is a compilation of various subjects from alchemy, magic, astrology, thermal therapies, hygiene, cauterization, bloodletting, leeches and other articles of folk medicine.[241] Adnan Adıvar would later describe Hezar Esrar in his

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[238] Şanizade Ataullah Mehmed Efendi, *Hamse-i Şanizade,* (İstanbul, Darü't- Tıbbatü'l Amire, 1235 H.(1820)), pp. 246-252

[239] Musa Çimen, "Hekimbaşı Mehmed Efendi'nin Hezar Esrar'ı,", *Toplumsal Tarih*, v.197, (May 2010), p 85.

[240] Çimen, p.87.

[241] Çimen, p.87.

famous book “Science in Ottoman Turks” as a collection of some absurd old medicine and Behçet Efendi as one of the people who were engaged in positive science while not being able to free themselves from the shackles of the old and the superstitious.[242] Though Adıvar’s book had been written in the early twentieth century, its expression is very much consistent with the spirit of the nineteenth century when it would be below the dignity of the positive science to coexist with the old, backward and superstitious ways.

The madrasah system and darrüşşifas were highly insufficient especially in terms providing doctors and especially army doctors. Before the nineteenth century, the core medical institutions were not in conflict with but were complemented by the peripheral medical sector due to the insufficiency of the system both in terms of medical efficiency and manpower. The major difference brought about by the nineteenth century is the change in the institutional organization of medicine and medical teaching brought about by the establishment of the new military medical schools. The modernization/westernization of medicine is highly interconnected to the modernization/ westernization of the Empire in general. As the Empire began the effort by and large through military reforms, the medical upkeep of the man source of the Empire became highly important and the new military medical schools became one of the foremost agents of westernization led by “European male doctors equipped with the powerful tool of modern science.”[243] Nineteenth century was no longer the coexistence and intermingling of the modern and the old ways of medicine but the century of their dichotomy. Furthermore the state and the new medical

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[242] *A. Adıvar,* Osmanlı Türklerinde İlim. (Istanbul: Maarif Matbaası, ikinci tabı, 1943), p.189- 196.
[243] Khaled Fahmy, “Medicine and Power: Towards a Social History of Medicine in Nineteenth-Century Egypt”, Cairo Papers in *Social Science*, v.23, no.2, (2000), pp.5.

institutions adopted the monopolistic mission of combating and controlling the whole of medical enterprise within the Empire.

It is understood that Europeans were also very much engaged in this war against the "charlatan doctors", as La Gazette Medicale de l'Orient turned into a medium of propaganda against all the crowd of healers. [244]

However, one should keep in mind that it was practically impossible for the new medical institutions to exclude the old ways and peripheral system completely. The establishment of the new schools did not bring about relief immediately; doctors were still in short supply. Between 1874 and 1902, there were only about four-hundred graduates of the Civil School of Medicine, and generally the graduates of the Military Medical schools were directly appointed to the army.[245]

Under these circumstances the state tried to control and to integrate some of the peripheral medical sector into the modern system. For example instead of banning the barbers from the art all together, around 1840s, a license given after an examination of the Surgeon Commission of the Military Medical School became obligatory. Those who were successful would be given the license to let blood and to pull out teeth.[246]

With the "modern medicine" the status, the social standing of the doctors also began to change. A new alignment to the new institutions and a new form of hierarchy began to take shape, not of course without conflict which is revealed through a document about bloodletting from the archives belonging to 1890s.

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[244] Musa Çimen, p.86.

[245] Musa Çimen, p.86

[246] Nuran Yıldırım: "Berberlerden Diş Hekimlerine İstanbul'da Dişçiler Mektebi Kurma Çabaları ve Dişçi Mektebi'nin Açılışı", *Toplumsal Tarih*, Sayı. 146 (Şubat 2006), 38-43.

The document[247] is written to the Chancellor of the palace *(Mâbeyn-i Hümâyun Başkitâbet-i Celilesi'ne*) and criticizes the prohibition of bloodletting by the influence of the physicians who wanted to diminish the importance of the surgeons. As the ban on bloodletting had caused otherwise preventable deaths, the document demands that the doctors should be let free to let blood, a practice still used in Europe, in cases they saw fit and that this permission should be announced in the newspapers and declared to the Council of Physicians. While trying to reserve the therapy for the use of doctors, the document tries to secure the exclusion of other groups demanding also that the barbers and blood letters should be banned from bloodletting. The timing and the content of this document is consistent with Kamus-ı Türki which also declares the practice to be abandoned at around the same year.[248]

As all of this philosophical and institutional change was taking place and as bloodletting continued its journey from being the cure against all ills, to being the controversial cure against some specific illnesses implemented and finally to abolishment, leeches crawled back out of the bloodletting package, adopted by the "modern medicine" as the new wonder drug and the dernier cri of the Parisian medicine.

As has been stated in the first part of the thesis the leech was crowned as a highly important materia medica by the French physician Broussais. The popularity of the leech would continue from 1830s well into 1870s, spreading to the rest of the Continent and America in no time.

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[247] BOA. DH.MKT 184/150, [22/B/1308]

[248] Şemseddin Sami, *Kamus-ı Türki,* 1317, p.541

It is important at this point to know if the impact of Broussais' medical understanding had reached to and had any impact over the medicine in the Ottoman Empire. And that information is found in the memoirs of Lorenz Rigler who was invited to the Empire as part of the medical modernization process. Rigler was sent to Istanbul on the request of Ottoman Empire with the mission of reorganizing the big hospitals. On 1844 Rigler was appointed to be the General Inspector of all the empire hospitals and the Chief of the Health Office in the Ministry of Defense. After the end of his duties, following his own demand to prolong his stay in Istanbul, he has been appointed as the director of hospitals and became a lecturer in the Galatasaray School of Medicine. He has also performed an eye surgery for Sultan Abdülmecid. Rigler, apart from six new hospitals established between 1842- 1849, founded the hospital for civilian patients. [249]

Rigler in his memoirs, assumed an estimation of six to seven thousand inexpert doctors functioning in a city of 800,000, most of who were political fugitives from Italy, Poland, East Mediterranean, mostly old pharmacists and translators. These people according to Rigler adopted the theories of François Broussais: "They believed bloodletting to be a remedy against all diseases and therefore arranged a cure of bloodletting every year in spring. It would be useful to add here that Rigler did not think that the medical knowledge of the above mentioned Turkish surgeons added up even to the level of practitioner doctors. According to Rigler, the therapeutical principles of Broussais School were not just implemented on the civilians but they were also used in the military hospitals by the Armenian and Greek doctors that the Ottoman State sent to Paris for medical education. These

[249] Alois Kernbauer," Lorenz Rigler İstanbul ve Tıp Coğrafyası", in *Österreichische- Türkische Medizinische Beziehungen,* Berichte des Symposions vom 28. Und 29. (April 1986) in İstanbul, pub: Arslan Terzioğlu, Erwin Lucius, Istanbul, 1987 p.135

doctors according to Rigler were working completely within the framework of Broussais.[250]

It is important to note here that a French surgeon called Sat Desgaillers began giving lessons in Cerrahane in 1832 and he could have also transmitted Broussais' theories at least for one year until his sudden death. Subsequently the Vienna ecolé started with the appointment of Karl Ambrose Bernard and Jacop Neuner.[251]

After Broussais, leeches evidently become much more sought after: "...as leech prices increased and as it was assumed that a shortage of leeches would largely reduce the ability to cope with the battle wounds, leech breeding and leech farms were financed by governments.[252] In the Ottoman Empire the provision of leeches to hospitals is a permanent concern that could be traced through the archive documents. The problems with the leech-farmers contracted to provide leeches for hospitals are quite common in the archival documents. It is understood that hospitals included leech therapists in their staff. In 1840s the wage of a certain leech therapist Haçador who worked in Toptaşı Military Hospital was two-hundred piastres.[253] A couple of documents also show transitivity between the personnel of leech therapists and that of surgeons as some of the leechers were promoted to surgeons. A certain Bekir, for example, the leech therapist of the Gülhane Hospital was appointed to being a surgeon assistant in Tersane-i Amire in 1858.[254] This does not seem to be a very

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[250] Kernbauer, p.136

[251] Ahmed Yaramış," Doğu Tıbbından Batı Tıbbına Geçiş Üzerine bir Deneme", in the *Proceedings of the 38. International Congress on the History of Medicine,* 1-6 September 2002, Volume II edited by By Nil Sarı, Ali Haydar Bayat, Yeşim Üman, Mary Işın, Ankara 2005, pp. 1214

[252] Michalsen, pp.10

[253] BOA. İ.DH 19/886, [12/C/ 1256]

[254]BOA. A. MKT. NZD. 245/100, [22/R/1274].

extraordinary practice as Ekrem Koçu, also relates that nurses especially in the military hospitals were trained into to surgeons and the successful ones were given surgeons license by the chief physician.[255]

Apart from the direct delivery from the tax farmers, pharmacies also acted as intermediaries of distribution. With the increase of the Military hospitals in number, a Military Pharmaceutical Depot was established in 1836. The hospitals provided their needs through lists that they sent to these pharmaceutical depots and one such extant booklet, the booklet of Maltepe Military Hospital includes leeches and some earthenware jars probably for their conservation.[256]

Ünver states that pharmaceutical trade occupied a very important place in the orient. There were two groups occupied with this trade: Druggists who were wholesale dealers managed both the import and export and sold the supply to pharmacies. These people often had offices in old inns and kept their supplies in depots. The other group engaged in pharmaceutical trade was the herb and spice sellers (aktar). Some of these people had shops in Mısır Bazaar and some of them had their shops in the living quarters distributed along neighborhoods. It is important to note here that leeches are still sold in Mısır Bazaar today. These people could also recommend certain medications and advise certain course of therapies but this authority had been limited by their kethüda from time to time. The customs tax taken from imported drugs was three percent. Ünver adds that the export of leech which was collected in a monopolistic format had especially been important.[257]

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[255] Reşat Ekrem Koçu, İstanbul Ansiklopedisi, 1968, pp.4613, 4614.

[256] Süheyl Ünver, Osmanlı Türklerinde Hekimlik ve Eczacılık, (İstanbul: Hüsnü Tabiat Basımevi, 1952), p.28.

It was not only the military and military hospitals that made use of leeches, the palace residents and high caliber government employees also consumed the little annelids which becomes evident through some archival documents. The document which belongs to the year 1839 and which was directly sent from the high office of the Sadrazam demands to know if Başkatib (Chancellor) will not be able to join the meeting in the Sublime Porte to discuss important matters due to his condition of health. Başkatib requests the meeting to be postponed, confirming that he had health issues. The health issues turn out to be some medications he was on and the implementation of his seasonal leech therapy. The leech therapy together with the unspecified medications must have been regarded as a legitimate excuse of health, enough to postpone an important meeting of the state as Başkatib was granted the permission.[258]

Through an archival document[259] belonging to the Royal Treasury office dating from 1860, we are informed of the uneasiness in the palace which is also communicated to the minister of medicine, caused by a leech tax farmer who did not bring the due leeches to the palace on time. It is understood he made a contract with the Mabeyn Pharmacy and the contract entailed the tax farmer to bring approximately two and a half kilos of leeches to the mentioned pharmacy on a monthly basis. Due to the violation of the contract, the pharmacy ran low on its supply of leeches 'in a season when leeches were desperately needed'.

Another document of the Royal Treasury is a bill of the cost of all the medicine that the chief pharmacist of the palace Panayot handed out with or without

[257] Süheyl Ünver, Osmanlı Türklerinde Hekimlik ve Eczacılık, İstanbul, Hüsnü Tabiat Basımevi, 1952, p.9-10.

[258]BOA. HAT. 1620/22, [1255/R./13].

[259] BOA. HH.İ, 1/64, [1267/M/24].

prescription. The bill is expected to be paid by the Royal Treasury account. It is stated in this document that one and a half okes[260] of the leech cost six hundred piastres.[261]

A document[262] that belongs to the year 1850 gives a crowded list of harem residents together with the number of leeches they were handed out. As the first two columns were written in Latin alphabet and the last two columns are in Arabic alphabet, the distributor of leeches might be non-Muslim or even a European as he misspells some names like Hurşid as "Hoursid" or kadim as "cadim". Because the document is in fact a cost account of the Royal Pharmacy (Mabeyn Eczahanesi), we can assume that the writer/ distributor is a staff of the pharmacy. The list registers the leeches that are handed out to individuals and sometimes to specific locations. The list includes names like Muzaffer Beğ, the horse attendant Hasan, the Eunuch İbrahim, the master barber, the laundry master, the harem of Selim Efendi or locations like fourth- tent quarter, chief service quarter, quarter of the chief woman, and quarter of the secondary woman. The list is comprised of two parts, leeches handed with prescription and without prescription. At the end of the long list the total numbers of leeches that are handed out are noted: From the thirteenth of April to the end of the month Mabeyn Pharmacy distributed 1816 leeches, with an average of 20 leeches per person or location. Two larger quantities, a pack of sixty pieces and another of seventy pieces are handed to the "hospital". This picture immediately creates an impression of self-application of the leech. The belief that leech in itself is a doctor and that it will attach to the ailing part or to where there is 'dirty blood' still

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[260] 1 oke is approximately 1300 grams.

[261] BOA. H. .HI, 2/51_10, [24/Ca./1267].

[262] BOA. H.HI, 6/23 _4,5 [11/B./1266].

persists today. Self-application of the leech is a strong likelihood but it is also possible that people kept the leech jars in case the doctor, the blood letter, the barber or the elderly leech women required it as part of the therapy. As for any kind of medical attendant it would be unpractical to carry leeches around, it could be a custom for the patient to supply a reserve of leeches at home. In the above document there were also leeches handed out with prescription which signals to the care of a medical attendant.

Apart from the military, and the upper class the medicinal use of leech by the common people is hard to trace. We know from the memoirs of Rigler, for example that though the first civilian hospital was open for everyone, no women walked into it in the beginning.[263]Probably not all the groups of society began to use the western style modern hospitals immediately. There must be people who were opposed, reluctant or even embarrassed to go to the new hospitals. Therefore leeches must have operated at two levels, in the modern hospitals as part of modern medicine and at homes or in the hamams along with the rest of the traditional medicine as part of reaction to the new hospitals.

Dr. Rigler states that after finding the doctors and the medical understanding in Istanbul operating a la Bourssais style, they have successfully turned the general medical understanding to that of the Vienna School in ten years. Rigler was obviously not much appreciative of the leech or the French understanding of medicine. He relates a memoir about two Turkish doctors in which he seems to relate backwardness of the doctors and the leech therapy. “Two Turkish doctors were trying to heal a tumor that has been located in the lower abdomen of a patient with chronic dysentery. As a course of therapy they have tried leeches, cataplasm and

[263] Kernbauer, pp.135

iodine lotions in vain…in vain because what these doctors diagnosed as tumor was in fact nothing other than the spinal bones that became apparent due to the extreme weight loss in the patients with dysentery."[264]

In any case, the meaning of modern in medicine was fundamentally changing and the medical vogue of the leech in the nineteenth century was coming to an end. After germ theory and the isolation of anthrax by Koch which proved that one single microbe caused one single disease, microbe mania replaced leech mania. All the scientists were engaged in a race to isolate the microbes of the fundamental diseases of the time. Pasteurization, sanitation, disinfection and hygiene, bacteriaphobia became the medical trends of the day while leech, a potential breeder of bacteria that could not be disinfected lost ground suddenly and swiftly.

[264] Kernbauer, pp.135

CHAPTER IV

THE LEECH MERCHANT

Artouse, the Leech Merchant of Marash

He with a smile did then his words repeat;
And said that, gathering Leeches, far and wide
He travelled; stirring thus about his feet
The waters of the Pools where they abide.
"Once I could meet with them on every side;
But they have dwindled long by slow decay;
Yet still I persevere, and find them where I may.

The Leech Gatherer by William Wordsworth[265]

The leech of the Ottoman Empire was not only sucking the blood of its subjects but also large quantities of European and American blood as well. There were numerous foreign traders within the borders of the empire, operating busily to secure the monopolistic fishing rights to sell them back in Europe and America.

It is may be best to try to construct the enterprise through the Marash leech merchant Artouse, one of the many statistical figures in the archives who came to life thanks to an article published in Chamber's Journal year 1860. The third part of the book "Living Age" which includes an article from Chamber's Journal and covers articles and issues from January, February and March of 1860 is very important in terms of giving life to one of the endless figures of leech merchants one comes across in the archival documents. The article is based on the observations of a group travelling around Adana, Aleppo and Marash on a sporting trip and gives information on various topics like leech trade, the daily life of the merchant, the leech fishery workers, the hunt of leeches, Turkish officers and Marash of 1860's. I will also integrate an article on Ottoman leech trade published in the newspaper

[265] http://www.netpoets.com/classic/poems/073010.html

Constantinople on the fifteenth of June in 1852 written by the European correspondent of New York Times and few archival documents which seem to complement each other into almost a whole story. Therefore the below narrative is constructed from the relevant parts of the above mentioned sources.

> Leeches are an article of commerce of greater importance than supposed and probably Turkey produces more than any other country. The product of Turkey is annually greater than that of any other country due to the sparse inhabitation, under cultivated land and many undrained lands: As the use of leeches increased superseding so often the lancet and cupping, the leech traders turned their attention to other countries.[266]
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> In America French leech is preferred to the American leech since it can draw thrice as much blood, and France exports these leeches from other Mediterranean countries. Fifty cents is often paid for a single leech in country towns. The retail price of leeches in country towns is one cent a piece only.[267]

Artouse of Marseilles discovered one such prolific marshland literally alive with leeches' on a sporting trip to Marash in which he himself fell senseless into the resourceful muddy waters following a coup de soleil. His revival and survival after the accident is thought to be due to the loss of blood sucked away by the resident leeches, quite consistent with the medical understanding of his time. Artous immediately foresaw an inexhaustible field of riches, for he knew very well the value and demand for leeches in France.[268] The merchant then set up a company through the assistance of the French ambassador and secured the sultan's ferman for the exclusive privilege of fishing of leeches throughout the district. It is understood that in spite of the extravagant sum originally paid to the government, a considerable annual surplus payment, many small and vexatious exactions of the local authorities

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[266] J. D. B. De Bow, p. 300

[267] De Bow, p.300.

[268] Eliakim Littel, Robert S. Littel, "The Leech Merchant of Marash in Living Age", in *Making of America Project*, V. 64, (Littel Son & Co., 1860), p.353.

and the ever mounting amount of the yearly new leases (for the local authorities had found out what a treasure-trove this infidel Frank had found out), leeching was such a promising speculation that Artouse had raised enough on Change at Marseille to have bought up all Adana.[269]

Artous bought some six or eight decrepit houses in the immediate vicinity of the sarai or pasha's palaces in order to use as depots. In one of these houses, he kept the peculiar clay in which the leeches were packed for shipment. The other house was piled up to the ceiling with empty boxes destined to contain the clay and leeches. These boxes had perforated bottoms in order to be able to hydrate the annelids without suffocating them during shipment. A third house would be reserved to leeches, full grown ones wriggling horribly about in everything that could serve to contain them. [270]

> Artous had more than two hundred and fifty men, women and children in his employment being paid on dozens, the price varying according to the size and quality.[271]
>
> The best fishing periods were spring and fall. The fishing process was quite an unhealthy process for the workers in terms of causing illness and fevers. A man often collected ten or twelve dozen in three or four hours.[272]
>
> The workers were paid only for the live leeches they brought. It is understood that leeching was done by the attachment of the leeches to the bodies of these workers which were later detached by the use of salt. Alternatively the fishing could be done through wading in water, stirring the mud and catching the leech with the stick.[273]

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[269] Littel, p.353.

[270] Littel, p. 354.

[271] Littel, p.354.

[272] De Bow, p..301.

[273]Littlel ,p.355.

The leech shipment was done once a year. As the proper season approached, Artouse's brothers arrived from Marseilles. The men busily sorted out the leeches, which was a crucial process in their transportation.[274]

In the Ottoman realm, three kinds of leeches were found, their cost ranging from three hundred piastres to seven hundred piastres. The smallest leeches were called 'file', the middle 'furt' and the big ones were called 'vast'. The size of the leech should be taken into consideration during transportation as the bigger ones could bite and kill the smaller ones. For example if 20 buckets of leech were demanded from France, the first kind will be placed in 16 buckets, the middle-big ones (one "oke"[275] of them should not exceed 630 pieces) in three buckets and the little ones called file in one bucket. The fishing and sale of vast which was sold per piece was forbidden in the Empire.

It is understood that the fishing of the size "vast" was forbidden in order to prevent the extinction of the leeches. This condition was strictly dictated to the tax farmers and a royal decree had been issued on this serious consideration but due to the huge profit margin, the tax farmers fished these vast annelids secretly from the civil servants. The single piece of the vast was sold from two to five para a piece.[276]

After the sorting out of leeches into proper sizes, empty cases were filled with a thick layer of soft clay, then leeches were placed in cases with a layer of leeches and another layer of clay followed by another layer of leeches and so on until carpenters nailed the boxes. Then, numerous caravans carrying "some million of

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[274] Littel, p.356.

[275] One kıyye is equal to 1282 grams.

[276] BOA. HR.MKT. 47/11, [5.N.1268].

leeches" began their long journey to France. For a long sea voyage, such as that from Smyrna to New- York, leeches were put into shallow tubs filled with wet clay earth, several hundred into one tub. Every few days, fresh water was supplied to them. If the owner was with them, he had to go over the whole mass of clay to pick out the dead ones so that they would not corrupt the remainder. The Mediterranean steamboats had special shelves designed to carry leech cases. [277]The leeches were also transported in wagons which were constructed to meet the purpose.

> The wagons are very artfully constructed to meet the purpose for which they were intended. They were in form of a huge chest, pierced with holes, and divided inside by a kind of trellis work, into a great number of compartments, each capable of containing a bag weighing six okes. This chest is very nicely adjusted on springs to avoid jolting.[278]

In France, however, they did not recognize the different kinds/sizes of leeches and all them were paid under one price, which had ranged from hundred to two hundred and fifty francs per kilo (312 dirham). The French only made a distinction between the large sized leech and the rest. The weight of the kind that is called vast changes from 1 dirham to ten dirhams and a thousand pieces cost between eighty francs to two hundred and ninety francs.[279]

Artouse, the leech merchant of Marash, was only tolerated by the "fanatical and almost exclusively Turkish population" because of his employment by the state. The leech merchant is portrayed as a lonely, exiled men fond of welcoming European visitors in his grand house which was a strange mixture of European and Oriental taste and famous for Artous' veritable French cook…The leech trader was

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[277] De Bow, p.301.

[278] Eneas Sweetland Dallas, " Curiousities of Leech Culture" in *Once a Week,*V.6, (Bradbury and Evans, 1862), pp.259-262.

[279] BOA. HR. MKT. 47/11,[5.N.1268].

constantly consoling himself in his almost exiled life only with the sweet thought of his bank account getting bulkier every week.[280]

Both the authors of De Bow and Living Age articles state their ideas on Turkish people and Ottoman dignitaries quite expressively, political correctness not being the main concern of the time: “All the workers were “bigoted Turks” and the “ugliest set of ruffians one could easily clap eyes upon. They were indolent wretches who work for a Christian dog out of their poverty and not their will.” The orientalist topos is complemented with the Turkish high offials who call Artouse “Selukje Bashi” with slippers at heel and pipes in hand, visiting Ardous with an ultimate eye on his French wine.[281]More direct and creative allegories between the leech and the Ottoman government could be found in the following paragraphs:

> Leech have been so often used by former writers in the East to symbolize those capricious harpies, the provincial pashas who after having sucked their own fill of treasure from the people, were obliged to disgorge at the capital, for the same reason that the leech is obliged to disgorge by the apothecary, that he may the sooner be able to repeat the operation of drawing blood.[282]

And,

> Each cocoon of leeches contains from 10 to 15 young ones, and when the cocoon bursts the young ones sustain life by sucking the blood of the mother and this trait in the natural history of the animal may lead u to recur to the illustration with which I began my letter: and to governors and subjects in Turkey, and the unwavering instincts of the leech, that is never satisfied, but from the very beginning is crying: give, give…[283]

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[280] Littel, p.356

[281] Littel, p.355.

[282]De Bow, p.301.

[283]De Bow, p.301.

CHAPTER V

LEECH AS A COMMODITY

Leech Fisheries and Tax Farming

Leech fishing in the Ottoman Empire was mainly managed through the tax farming system. The majority of documents in the archives reveal efforts to set up this system even in the remotest places of the Empire and to control the supply and revenues of the commodity within this system of management. Throughout the documents, there is an ongoing cadastral survey to determine the potential lakes with rich leech supply and to articulate them into the system. For example the lakes in Suğla ve Aydın area that later became an established and profitable chain of tax farming were initially fished by freelance traders until the government took the area under its control in 1837.[284] The survey was extended as far as the Arab provinces where some streams were reported to be worthy of tax farming in Sidon (Sayda), Acre (Akkâ) and Tripoli of Syria (Trablusşam) around 1848. There were also late-comers into the picture like the province of Menteşe that remained an unregulated area till 1856 since "tax farming was not initiated as they did not know the management of leech fishing over there".[285] Leech fishery was carried out also in some ponds and streams of Istanbul.[286]

Obviously not all the lakes had a supply worthy of tax farming. The *mutasarrıf* of Jerusalem, a certain Muhammed Bey, reported in 1846 that there were

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[284] BOA. HAT. 530/26162, [29.Z.1252]

[285] BOA. A. MKT. UM. 223/54_2, [28.Ca.1272]: "Menteşe Sancağı sülük saydiyyesinin şimdiye kadar oralarda idaresini bilemediklerinden iltizamına kimse girişmeyüb 68 senesinden beri yüzü üstüne kalmış.."

[286] BOA. HAT. 1342/52450, [29.Z.1250]

small streams around Jaffa (Yafa) and Nablus that were not yet given to tax farming, and where the supply was barely sufficient for the locals and used by barbers and others in demand of the medical particularities of the annelid. [287] The fact that Baas did not have any supply was discovered by the need for leeches of the army the command of Mehmed Paşa, residing in the close vicinity of the area.[288]

These documents about surveys are generally clustered around the late 1830s and 1840s, declining towards the end of the 1850s. This could reflect the fact that by the end of this period the map of the potential lakes was more or less drawn and finalized.

Once a lake was found to be fertile, it was put to auction by the government. Ideally the bidder who offered the highest price was given the lease of all the lakes and streams of the area. However the bidding process was not without complications. The most common problem associated with the auction process seems to have been "double bidding" as revealed from some documents. The standard regulation, as deduced from the documents, was for the auctions to be held in Istanbul; however, sometimes the auctions could also be realized in the locality of the lease, especially with the initiative of a high official of the area. In the case of the İşkodra (Shkoder) lease of 1855 the Austrian consulate directly interfered to protect the rights of one of its citizens whose license, acquired through an auction realized by the governor Ragıb Pasha, had been overruled by an auction held in Istanbul. As the tax farmer had an official document in hand, and thus had a right to demand a high indemnity, and as the bidder of the auction in Istanbul had offered a greater

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[287] BOA. A. MKT. 37/27, [8.Ra.1256]

[288] BOA. A. MKT. 53/99_2, [15.Za..1262]

amount than the Austrian citizen, the Imperial Treasury faced a risk of loss. In such cases, the government often adopted the method of investigating its civil officials who managed the auction and compensating the loss from them if any fraudulence on their part was to be discovered. [289]

The leases started in March, beginning of Ottoman fiscal year, and finished at the end of February and could be given yearly, for two years, three years and even for four years. As reflected in many documents, it constitutes a major stress for the government to set the tax farming system, find bidders, apply bureaucratic procedures and meet the deadline of the beginning of the fiscal year. The rights of the previous year leech fishery were cancelled by the kadis of the provinces and the down payments of the following year could not be accepted until the cancellations were approved. [290]

The government was generally unwilling to lease the fisheries in the absence of a reliable money-lender (*sarraf*) who could back the tax farmer up financially. In the case of Dimitri Ohannidis which can be taken as an exemplar to other similar cases, the lease was transferred to the next candidate as Dimitri turned out to be acting on his own, without the support of a money lender.[291]

After the lease, the tax farmer held all the fishing rights of the lakes and streams in the area he had paid for. However, this fundamental condition, which the government was supposed to guarantee to the tax farmer, turned out to be the most difficult and problematic issue, as a great number of documents reveal.

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[289] BOA. HR. MKT 112/62, [14.L.1271]

[290]BOA. C.ML. 21595, [14.Za.1257]

[291]BOA. C.SH. 1313, [11.C.1258]

Edict of Tanzimat

The impact of the *Tanzimat* over leech fishery and its regulation is quite visible and revealing. A hatt-*ı hümâyun,*[292] or Imperial decree of the year 1841 exposes the changes brought about by the propitious new order. It states that leech fishery and extraction from the lakes and streams of Anatolia and Rumelia had until then been realized through a monopoly (*yed-i vâhid)* and the tax farming system. However it also announced that the "New Order" defined tax farming and monopolies (*yed-i vâhid, inhisar*) as articles of oppression and that they, therefore from then on would be abolished in the Ottoman lands. However, the document also showed some uneasiness on the part of the government as it demanded that the abolishment of leech fishery monopolies be realized most cautiously and swiftly as a requirement of the "Trade Agreement," so that no whining (*sızıldı*) and other disturbing attitudes would be witnessed on the part of the allied states. The "Trade Agreement" referred to was obviously the Baltalimanı Treaty signed with Great Britain in 1838 and that concentrated on trade issues and enforced the abolishment of all monopolies. The Ministry of Foreign Affairs (*Nezâret-i Umûr-ı Hâriciye)* was prompted to announce to the friendly nations and to the muhassıls (tax collectors) that this commodity had been removed from its status of monopoly (*sûret-i inhisar*).[293]

Furthermore, the decree stated that leech fishery was transferred from the Finance Treasury (*Maliye Hazinesi*) to the Trade Treasury (*Ticaret Hazinesi*), all of which show that *materia medica* was at that point already conceived as a popular commodity.

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[292]BOA. HAT. 1423/58220, [7.M.1256]

[293] BOA. HAT, 1423/58220, [7.M.1256]

In 1840 various treasuries of the Empire were collapsed into a single one, namely the *Hazine-i Celile-i Maliye* or Finance Treasury. Nevertheless, because the assets of the abolished treasuries could not be liquidated immediately, they continued to appear in budgets under the name of their old treasuries which were specified with the adjective "*mülga*" (abolished).[294] As can be understood from the document[295] in which the adjective "*mülga*" appears to define the Trade Treasury, the management of leech fishery was re-transferred to the Finance Treasury in 1842.

The new order brought about by the *Tanzimat* also touched upon the legislation on leech fishery and banned any tax farmer from fishing in areas other than the areas he had leased from the government or to damage other leech farms. Furthermore, it was stated that leeches fished from a tax farmer's area without his permission would be regarded as stolen and that the leeches in question would be returned to their rightful owner. [296]

The *Tanzimat* seems to have brought new sensitivities and regulations to the leech trade. For example, the preservation of natural resources with a concern for their long-term profitability is stressed and underlined in many documents including the above Imperial decree. The new regulations put it as a condition that traders should be very careful in the fishing process in order not to shed the lakes and streams and thus destroy the valuable leech seeds found under the mud. Another decree[297] stated that this issue had been taken seriously enough to be discussed in the

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[294] Yavuz Cezar, Osmanlı Maliyesinde Bunalım ve Değişim Dönemi, (İstanbul:Alan Yayıncılık, 1986),p.291

[295] BOA. C.ML 454/18381, [29.Z.1258]

[296] BOA. C.HR. 10/ 456, [29.Z.1255]

[297]BOA. HAT. 1424/58282, [20.M.1256]

General Assembly (*Meclis-i Umumi*) following some intelligence that some of the leech farmers of the previous year had acted with greed, ripping and shedding the streams and thus destroying the valuable leech seeds.[298]

Another consideration related to the *Tanzimat* was not about the producers or the production process but rather about workers, those leech hunters who otherwise remain invisible in the archival documentation. The decree[299] that was addressed to the Minister of Trade, Fethi Pasha, stated that oppression (*cevr ü ezâ*) to workers or not paying their daily wages went undeniably against the protective spirit of the *Tanzimat*. This document shows that leech fishers, in addition to their difficult and unhealthy working conditions, had to face the problem of dealing with exploitative tax farmers who probably demanded long working hours and did not pay wages regularly.

However, when reading the documents one senses that the abandonment of the old order (*nizam-ı kadim*) and the corresponding abolition of monopolioes were problematic from the perspective of leech tax farming.[300] One of the main troubles of tax farmers was that other traders operating within their leased areas could cause a substantial decrease in their profits. In these cases, the tax farmers, as revealed in the documents, often asked for compensation from the government which they held responsible for the protection of their area. Some cases of outside interference with leech tax farms will best illustrate the situation,

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[298]BOA. HAT. 1424/58220, [20.M.1256]

[299] BOA. HAT. 1424/58220, [20.M.1256]

[300] BOA. HAT. 1424-58220,[20.M.1256]

A document dating from 1844 and addressed to the military governor (*müşir*) of the province of Hüdavendigâr (Bursa) concerned complaints of outside intervention from other traders who fished leech without the permission of its tax farmer in his area of jurisdiction, especially around the vicinity of Adapazarı. Though these illegal fishing activities by traders without permission from the tax farmer should have been regarded as theft, the document stated that the police remained inactive in enforcing the regulation as stated in the decree in cases of theft, and demanded the immediate application of the written rule as this inaction was damaging to leech fishing.[301]

Another document belonging to year 1855[302] reported the case of the province of Jannina (Yanya) and the surrounding areas which had been leased for 87,500 piastres for two years. The tax farmer claimed a loss of two hundred and forty three okes (*kıyye*)[303] of leeches as a result of illegal fishing by some British traders in his area. The tax farmer Rafael, a merchant from the Jewish community, was therefore asking for the compensation of his loss from the Treasury through a petition sent to the Supreme Council (*Meclis-i Vala*). Another document[304] established the amount Rafael asked for at 100,000 piastres to be subtracted from the total amount he was due to pay to the Treasury as the cost of the leeching rights of the area. Yet another document addressed to the Ministry of Finance ruled on the case and stated that under the light of the investigations that were carried out, Rafael was found to be aggrieved and an order was given for the necessary measures to relieve his

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[301] BOA. C. ML. 5299, [15.Ca.1260]

[302] BOA. A. MKT. NZD. 145/30, [2.Ş.1271]

[303] 1 kıyye equals approx.1283 gr.

[304] BOA. A. MKT. UM. 203_1, [15.Za.1271]

distress.[305] If we consider that the total value of the fishery revenues amounted to 175,000 piastres, it would seem that a decrease of 100,000 constituted a serious loss for the Treasury. The government's efforts to control the activity of other traders then become more understandable as in many cases the compensation claims had to be met by the government.

Yet sometimes government officials were directly reprimanded due to their inaction in cases of theft as was the case the in a document[306] addressed to the governor of Salonica Yusuf Pasha about a Jewish Ottoman trader who stole four okes (*approx. six kilograms*) of leeches from a district which was leased out to a tax farmer by the name of Ahmed Agha. The stolen leeches were taken from the Jewish trader but the authorities had to let him go as he was not given any sentence. The document stated that leaving a theft unpunished could serve as a bad example and encourage other thefts which would eventually lead to a decrease in the revenues of the Imperial Treasury.

There are many documents that reflect the problems between tax farmers and the government as in cases where the tax farmer could not pay the due amount of his lease, when the actual supply of the leech turned out to be much lower than estimated, when customs officials demanded unlawful payments during transportation, or when two tax farmers could not settle matters of leases among themselves or when partners fell into a dispute. All through this busy trafficking and humming one can feel the high value of the commodity in question and an avid effort on the part of the parties involved to take their share in the profits.

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[305] BOA. A.MKT. NZD. 170/83, [2.Ra. 1272]

[306]BOA. A. MKT. UM. 122/28, [6.R. 1269]

Leech Trade

The numerical data associated with the leech trade is problematic as it draws from documents and sources that do not necessarily employ common units of currency or weight. The document[307] which provides significant information about the return of the leech tax farming to the treasury is an Imperial decree from 1840 which declares an annual return of "*yedi yük elli bin guruş*"; 750,000. In order to give meaning to this value, it is possible to compare the amount to the average wage of a worker. Between 1840-1849 an unqualified worker would have to work for 127118,6 days (approx. 353 years) to earn 750,000 piastres.[308]

The total volume and value of leech trade is harder to trace than the amount which had filtered down to the treasury. One of the sources which provide detailed information on this problem is a "sketch" taken from the European Correspondence of New-York Times written from Constantinople.[309] The "sketch" claims the product of the leech fishery in Turkey to be greater than that of any other country due to the want of cultivation, the amount of undrained lands, the sparse inhabitation and due to the facilities allowed to the Europeans who followed the business and who were granted the protection of the local authorities.

In the "sketch", the annual product of leech fishery is stated to be 180,000 pounds. As a pound of leeches cost eight dollars, the total annual sum is claimed to be 1,440,000 dollars worth at the place of exportation. According to the exchange

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[307]BOA. HAT. 1423/58220, [7.M.1256].

[308]Şevket Pamuk, Osmanlı Ekonomisi ve Kurumları, (İstanbul :Türkiye İş Bankası Kültür Yayınları, , 2007), p.166; The calculation has been done by taking the nominal daily wages of an unqualified worker between 1840-1849 found in Table 1.

[309] De Bow, p.300.

values of 1850, 1,440,000 dollars equal approximately to 31,680,000 piastres.[310] The same article estimates the total number of exported leeches to be around 50 to 60 million units and also exposes the tax farming price of all the lakes and streams of the Empire as the "small amount of 140,000 dollars" leased to a company of four traders.[311] The tax farming price equals approximately to 308,000 piastres nearly one hundredth of the above mentioned total value of annual leech trade worth at the place of exportation and nearly half of the 750,000 piastres which was claimed to be the annual return of the tax farming into the treasury as stated in the Imperial decree.

We can compare the above data to the information provided by another document. This document is from the twenty third of July, 1852. A certain Edward Roskovich, probably a foreign trader as his bill required translation, offered the Sublime Porte a proposal advocating the abolishment of monopoly on leech farming and argued that providing every interested party with a license to fish and trade leeches would be much more profitable for the treasury. Roskovich, in this proposal, claimed the yearly exported amount of leeches as 50,000 okes and estimated the price of each oke to be between 300 to 400 piastres, generating a total sum of 15 to 20 million piastres. A third estimation on leech fishery values is found in the same document stated by the Director of the Medical School in an effort to argue against Roskovich who advised the government to abolish the trade monopoly on leech fishing. His numbers are 10,000 to 15,000 okes per annual amount of exported medicinal leech, which makes a total of 3,000,000 to 4,500,000 piastres. The above

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[310] Şevket Pamuk, A Monetary History of the Ottoman Empire, (Cambridge:Cambridge University Press, 2000), p.209
Table 13.1 The exchange rates of other currencies expressed in Ottoman gold liras, 1850-1914.

[311] De Bow, p.300.
The lease of all the lakes and streams of the Empire to four foreign traders is also verified by archival documents.

three amounts estimated for the value of medicinal leech at the place of exportation respectively are; approx. 30,000,000 piastres estimated by the New-York Times correspondent, 15,000,000 to 20,000,000 piastres estimated by Roskovich and 3,000,000- 4,5000,000 piastres estimated by the Director of the Medical School.

Nevertheless, the unit price of oke in both of the above sources is consistent, the first one being around approximately 300 kuruş[312] and the second one raging between 300 and 400 piastres per oke. This price range is also comparable with another document that is from 1852[313] which estimates the price of exported leeches between 300-700 piastres per oke and states that one kilo of leeches would find buyer between 100 to 250 francs in France.[314] Therefore, although the volume of the exported leech varies from one source to the other, one can say that the documents in hand seem to be in consensus over the price of oke per piastres as ranging from 300 to 700. It will be helpful here to relate that the cost of leech fishing is stated to be between 50-60 piastres per oke in another document from 1850.[315] The profitability derived from the low cost of leech fishing in the Ottoman Empire is further demonstrated by a document which reveals the case of an Austrian trader who manipulated the workers of the İşkodra leech fishery by claiming that he was sent by the government after the demise of its legitimate tax farmer and was willing to pay the almost double price of 100 piastres for an oke of leeches. [316] Although he was ready to pay double the amount of the normal tariff, the trader was obviously still within the range of a viable profit margin.

[312] 8 dollars a pound is approximately 300 piastres/oke

[313] BOA. HR.MKT. 47/11, [5.N.1268]

[314] Equals approximately to 312-780 piastres /oke

[315] BOA. A. MKT. UM. 18/43, [2.Ş.1266]

[316] BOA. A. MKT. UM. 18/43, [2.Ş..1266]

A few conclusions can follow from the above data: the amounts can be overstated or understated due to ignorance over the figures or due to the unknown interests of the involved parties. Alternatively, the discrepancy between the estimated total export costs and volume can indicate smuggling, an assumption which is also backed up by the numerous archival documents dealing with theft (sirkat). In addition to these documents, some articles written on leech trade around 1850 reflect smuggling as a common practice; "The French traders are supposed to belong all to one company, some members of which reside in Orsova where they contrive to get the leeches smuggled in small parcels from Wallachia where their free exportation is prohibited"[317] or "Leeches are not allowed to be exported from the dominions of the Czar but as they are when obtained in quantity of considerable amount of money value, a large trade has been carried on in smuggling them".[318]

In either case, leech trade with its connections to the Continent mainly through the ports of Trieste, Marseilles, to London and to America is a solid sign of integration into world trade which is further demonstrated by the numerous foreign leech tax farmers and leech traders in charge of the fishing and tax farming process in the Ottoman Empire. However, the amount that filtered down to the treasury in relation to the total value of the leech trade might indicate ineffectiveness on the part of the government to adequately benefit from the financial potential of the leech trade.

Whatever the proportion of the general volume of the trade had been to the gain of the Treasury, the documents show that the commodity was held in high

[317] William Haig Miller, James Macaluay, William Stevens , The Leisure Hour, vol.158, vol.209, Paternoster Row, 1855, p.54

[318] Eneas Sweetland Dallas ed., Once a Week, vol. 6, Bradbury and Evans, 1862, p.54

esteem and one document[319] even describes leech trade as the most important asset of the Treasury.

Ottoman officials seem to have been aware of the scarcity and upward changes of leech prices in Europe. A document[320] addressed to the Minister of Trade in 1857 questions whether the scarcity of leeches in Europe could eventually drive its price upward in the Ottoman Empire. However in this particular case, the matter was only slightly touched upon and left aside as a subject for further inquiry. Meanwhile, the price of the subsequent leech tax farming auctions was left under the old tariff and any price increase was strictly prohibited until any change of tariff was decided upon.

The Foreign Affairs Translation Office

Keeping the above information in mind, this thesis will now concentrate on the documents emanating from the Ministry of Foreign Affairs Translation Office (*HR.TO, Hariciye Tercüme Odası*) between 1850 and 1860. It is possible to claim that all the documents related to leeches in the archives gain another dimension when they are evaluated together with the documents found under this particular series.

If, throughout the documents written by the Ottoman Government, the *Tanzimat* is taken to be the cornerstone and *raison d'être* of the new order and of the new trade regulations, the Baltalimanı Treaty of 1838 signed with Great Britain has to be considered as the fundamental convention referred to with the same frequency and importance in documents concerning foreign parties. The whole of the Ottoman Government's documents concerning leeches and their trade refer to the Baltalimanı

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[319] BOA., A.MKT.MHM 7-43, [05.Z.1264]

[320] BOA. A.MKT.NZD 117-45, [30.Z.1270]

Treaty only a few times, calling it simply the "Commercial Treaty" (*Ticaret Muahedesi*). In governmental documentation, all the new regulations, and especially the abolition of monopolies over the leech trade seem to have resulted from a governmental will, decision and initiation shadowed by occasional concerns about possible foreign reactions. From the perspective of the embassies, the modifications in trade regulations were viewed as obligations imposed by the Baltalimanı Treaty, but that were not really and sufficiently honored by the Ottoman government. However, it is interesting to note that the issue of tax farming which was also announced as an item of oppression and thus the abolished in the *hatt-hümayun* that introduced the changes brought about by the *Tanzimat* over the leech trade, continued to operate as the basis of the leech farming system till the end period covered by the series. Furthermore, foreign parties, despite their insistent objections to issues of monopoly, also acknowledged the tax farming of leech fisheries as a legitimate right of the Ottoman State.

The main issue of the busy trafficking between the embassies and the Ottoman government can be reduced to the abolition of all the trade monopolies over leech fishing in the Ottoman realm.

The most informative document[321] on this issue is the one addressed by the British Ambassador, Lord Stratford de Redcliffe, to the Porte in 1848. In short, the ambassador underlined the most legitimate nature of the Ottoman Government's right to farm out its leech fisheries in state owned (*mirî)* lands. However, he also insistently objected to those tax farmers who claimed all of the leech supply circulating in the market as a produce of their own fisheries, and who expropriated the commodity of other traders without resorting to any kind of inquiry on the

[321] BOA. HR.TO 258/19, [8.M.1265]

grounds of governmental prohibition and theft. The ambassador stated that it was almost common knowledge that there was also a considerable supply of leech other than those found in the fisheries under the tax farming regime, and that there were even imported leeches circulating in the lands of the Empire. Therefore the ambassador demanded that the Ottoman government make a distinction between these two kinds of leeches and stop backing up the tax farmers' monopolistic claims. This attitude, the ambassador almost warningly said, would be a violation of the trade treaty, which in turn could be regarded as unjust to traders and an insult to the foreign friendly countries, thus contributing to weaken the esteem and dignity of the Empire on the international arena. This document can be taken as a fundamental model for the various other documents addressed by the embassies of France, Italy and Austria underlining the same considerations.

Such diplomatic notes must have placed the government in a stressful position between the demands of the foreign countries and the profitability of its tax farms. There was less or no demand for the auctions of areas with high outside intervention and the tax farmers of such areas could not pay their due amount to the government. Obviously such problems threatened the whole structure but there were also other benefits in keeping the monopolistic system. These are summarized by the Director of the School of Medicine in an effort to argue against the foreign trader Roskovich who offered the Porte a proposal to provide every interested trader with a license to fish leech. Roskovich claimed that extracting customs duty from the exported leech would be more profitable for the government than adopting the monopolistic tax farming method. The Director as a counter-argument to Roskovich stated the difficulty of providing medicinal leech for the hospitals during extreme weather conditions that could result in the freezing of the lakes without a proper system like

tax farming. He also reminded the economic burden of employing numerous officials with high wages to collect these taxes throughout the Empire. Finally he pointed to the impossibility of this commercial freedom as the rush of many people to the water sources to fish leeches would result in the total extinction of the annelid within a few years.[322]

The rather aggressive tone of the *HR.TO* (Foreign Affairs Translation Office) documents and their great numbers can be taken as another clue as to the importance of, and to the high foreign demand for, leeches. There could however be more direct cases of diplomatic intervention as can be seen in the case of an Austrian trader who manipulated the workers of the İşkodra leech fishery by claiming that he was an official of the state and bought from them 300 okes of leeches in three months by paying more than double the usual daily wage applied in leech fishing.[323] The relevant document stated that the inquiries about this case led to the conclusion that the council itself had to do with the theft and the case and the investigation was forwarded to Trieste in order to assess the total amount of stolen leeches and the consequent loss brought about by this theft.

Under the light of these documents one understands better what was meant by the word "*sızıldı*" (whining) so frequently used by Ottoman officials to describe foreign complaints. Various documents suggest that the Ottoman government was not completely at ease with the idea of opening up the tax farming of leech fisheries to foreigners.

[322] BOA. C.ML. 4109, [5.S.1269]

[323] BOA. A.MKT.UM, 18/43 ,[2.Ş.1266]

A document[324] sent to the Finance Ministry in 1853, while trying to settle the problems of some foreign traders, expressed concern over the lease of leech fisheries to foreigners and demanded that the issue be discussed at the Supreme Council (*Meclis-i Vâlâ*) as foreigners could cause various difficulties in the future.

Another document dealt with the case of the selection from among the bidders for the lease of the province of Tırhala in 1853, to which had also applied an Ottoman Greek trader by the name of Foti Papa for the yearly amount of 45,000 piastres. The other candidate applying for the same bid was a foreigner. It was underlined in the document that if the lease was given to a non Muslim Ottoman subject, the tax farming would be managed with greater ease and more peacefully than it would have been in the case of foreigners, with risks of rumors, gossip and general disturbance on the part of the community. This is one of the rare documents that reflected a potential unease and disturbance on the part of the community and of the residents of that area as a reaction to foreign leech traders. However, the second part of the thesis in which I tried to reconstruct the life of a foreign leech trader, revealed the same uneasiness on the part of the locals of Maraş. The attitude of the locals was described as a state of uncomfortable tolerance for the sake of the official document given to the trader by the Ottoman Government. Apart from the residents, the workers were described to be in a state of animosity contained only for the sake of the daily wages they were paid by the foreign merchant.

It is impossible to determine the attitude and sentiment of leech fishery hunters and locals towards foreign tax farmers due to scarce evidence. However as there had been numerous tax farmers and foreign traders operating in the Ottoman

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[324] BOA. A.MKT.NZD 93/9, [29.Z.1269]

realm throughout the years 1840-1870, it is safe to assume that no major disputes took place with the locals nor with the workers that reflected themselves onto the documents.

A document[325] dealing with the tax farm auction of the province of Menteşe in 1856 stated that a certain Ali Efendi had taken the fishing rights of the province for two years at the cost of 10,500 piastres. The document demanded that the utmost care be given to the organization of the official procedures so as not to leave any space for foreign claims, discontent and whining.

The documents above reveal caution and sensitivity on the part of the government but also hint at the probability of a very tight and close follow up on the part of embassies over the tax farming management of leech fisheries, which might be considered as another proof to the almost aggressive foreign interest in the commodity.

This sensitivity about foreign intervention can be taken into consideration in the evaluation of a set of documents that did not made much sense at first sight. These documents also can be regarded as a clue to understanding the attitude of the Ottoman government in the face of foreign demand and intervention backed up by the Baltalimanı Treaty. It must be stated that although the archival documents are mostly the records of governmental decisions and actions, it is very difficult to decipher the deeper thoughts and intentions of the governmental machinery as the self-expression of the government, as it is revealed through the documents of leech fishery, remains highly discreet. However, the document below can point to a

[325]BOA. A.MKT .UM, 223/54_2, [28.Ca.1272]

strategy, an initial attempt on the part of the government to deal with foreign pressure over the management of leech fishery.

The document [326] dates from the beginning of the year 1842 and it is rather like a registry of the yearly tax farming prices of various provinces; in that sense it is unique among the documents in the Cevdet Maliye series. The tax farming of these areas, as stated in the document, were not given to foreigners but to Ottoman citizens (*tebe'a ve re'âyâ-yı Saltanat-ı Seniyye*) who were backed up by local and reliable guarantors.

This exclusion of foreigners from tax farming in the year 1842 could be due to a variable unspecified in the document but might also be an initial attempt to reserve leech fisheries to Ottoman traders who were less problematic, who did not open doors to foreign intervention, and whose financial return to the treasury could be guaranteed by trustworthy guarantors.

Whether this was an initial attempt or not, it was not successful, for after that date the documents reveal many foreign tax farmers operating in the Ottoman lakes and streams probably in the face of a mounting foreign demand and the mounting need of cash.

In 1850, the Ottoman government adopted the extreme measure of leasing all its lakes and streams in Rumelia and Anatolia to four Austrian and English traders for the duration of four years starting in March of 1264.[327] This company of foreign traders in turn subcontracted their lease of the area to other traders. For example, they subcontracted the leeching rights of the provinces of Üsküp (Skopje), İşkodra,

[326] BOA. C.ML. 454/18381_1 and C.ML 454/18381_2, [29.Z.1258]

[327] A.MKT.UM 4-68

Ohri, Leskofça, Niş and Elviye to a non-Muslim resident of Ohri for the sum of 22,000 piastres.

The 1850's seem to have been the period when the documents related to leech trade reached their maximum in the archives and when foreign intervention seems to have been most intense as revealed from the Translation Bureau documents. In need of cash and/or under the mounting demand and aggressive foreign pressure on the commodity, the Ottoman government might have found the lease of the whole area to a group of foreign tax farmers more functional in dealing with the increasing tension between the tax farmers and traders who operated outside this system.

However, as suggested by the following documents, leasing out all the leech fishing rights of the Empire to a single company remained a single case, which eventually failed as claimed in the sketch published in *De Bow's Magazine.*[328] The article gives the reason of the failure as the inability to sustain the monopoly promised by the government.

The Domestic Market

The rise of a domestic market for medicinal leeches is voiced by the director of the School of Medicine who claimed that in 1852 that only about 10-15,000 okes of leeches out of 25,000 could be exported to foreign countries due to the domestic market that had developed in the last few years and consumed 8-10,000 okes of the total leech supply.

The major part of the domestic demand seems to have originated from the military hospitals which are also referred to in the archival documents. One understands that the leech price given to the military hospitals by the tax farmer was

[328] De Bow, pp.302.

lower from that given to "others" (*ahara*), of 5 piastres per oke.[329]An Imperial decree from about the same period confirms the same amount for hospitals exposing the prior price as 25 piastres per oke. The decree also gives an idea of the prices of leeches in the domestic market, estimating an amount of 3 to 4 "*para*" per unit (*approx. 63 piastres per oke*).[330]

As understood from the first part of the thesis, leeches were regarded also as important *materia medica* in times of war, and it is also possible to track the same sensitivity in the Ottoman documents to make sure that the supply of military hospitals was properly provided for. The golden age of medicinal leech which seems to be the period between 1850 and 1860 also coincides with the Crimean War *(1853-1856).*

As a certain Pirogov who performed martial medicine during the Crimean War and the Caucasian expedition has related, leeches were quite popular on the war fronts: "I put 100 to 200 leeches a day. Even in simple fractures, where only slight swelling was observed, immediately leech. Of the last forces to help a dying friend, a military doctor put mortally wounded Pushkin in the stomach 25 leeches. Fever and abdominal inflammation decreased, the pulse became smoother."[331]

In the Ottoman case, according to the military health organization of the Crimean war, a hospital building would be built in a hygienic, ventilated and central

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[329] C.ASKERİ 10275, [17. L. 1255]

[330] We have to keep in mind that the documents belong roughly to the beginning of 1840's and the rise of domestic demand is associated to with the 1850-1860 interval. Therefore it is probable that this price followed an upward trend in the fifties.

[331] http://hirudo.kiev.ua/languages/hirudo_en.html

location around the headquarters of each army. The medical personnel of these central armies would include twenty one attendants specialized in applying leech.[332]

Although a meaningful reflection of the war over leech fishery can not be traced in the documents, it would not be wrong to assume a substantial increase in the leech demand created by the war time conditions.

Decline

In order to understand the popularity of leeches as a commodity, another clue comes from taking a cursory look at the leech tax farming costs in a comparative manner which would act as another indication of the change in the demand for leeches. Unfortunately the sources in this respect are quite scattered, disorganized and as far as we can see, incomplete. One of the most fundamental sources to be used in order to get an idea of price changes over a long period are the registers transferred from the Financial Administration (*Maliye Defterleri*).

The price registries from the 1840s and 1850s, which can also be tracked from the Cevdet Maliye series documents[333] give lists of around fifty places, which included many provinces that were grouped together with the districts or other provinces in their close vicinities and which were priced in a range from a minimum of 2,500 piastres to a maximum of 250,000 piastres demanded for the province of Salonica. In the 1850s the leech tax farming prices registered in MAD series were transferred from the *Ruznamçe* registers to the *Sarraf* series and it seems that the

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[332] Serap Torun, Kırım Savaşında Hasta Bakımı ve Hemşirelik, (Ph.d. Diss. Adana University, 2008), p.63

[333] BOA. C.ML. 18381_1 ,_2 ,[29.Z.1258]

costs were stretched over several installments.[334] It is difficult to estimate prices through these registers as the number of installments was not clearly specified.

The final leech registries that can be tracked in the *Maliye Defterleri* registers seem to have been recorded around 1870's and the same series' tax farming price registries between 1860 and1868 portray a totally different picture from the crowded lists of the 1840s and 1850s. The provinces offered for tax farming were confined to only a few provinces without feeling the need for any grouping and there seems to have been no foreign traders among the tax farmers. If we are to make some comparison of prices, the province of Avlonya was given to tax farming between the years 1281 and 1284 for 6,000 piastres,[335] whereas in the registries of 1842, Avlonya was listed together with Yanya and some other districts, for the total cost of 129,000 piastres. The cost of the Filibe-Tatarpazarı farm was of 200 piastres in 1282 against 14,250 piastres for the entire province in 1842. Leech had also ceased to be an important item of export and a significant commodity in Smyrna, around 1870's the price of one oke of medicinal leech declined to 35-38 piastres.[336]

The fall described above in the demand as reflected by the decrease in the number of provinces and of the costs of the provinces offered for leech tax farming is quite consistent with the end of the leech craze in Europe, which can be once more be demonstrated with the case of German businessmen: they proposed the establishment of a prestigious leech trading company Die Actiengesellschaft Hirudinea in 1863 but they were too late, as in the age of Koch, Pasteur, and

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[334] BOA., MAD.d, 12077 and MAD.d,10821

[335] BOA.,MAD.d, 7690

[336] Cihan Özgün, Sülük in İğdiş, Sünnet, Bedene Şiddet Kitabı, ed.Emine Gürsoy-Naskali, Aylin Koç, Kitabevi, İstanbul,2009, p.259

Virschow, leeching disappeared from the medical repertoire[337] of the nineteenth century and from the archives of the Sublime Porte.[338]

[337] Michalsen, p. 19

[338] In fact there are a bunch of documents which belong to the beginning of the twentieth century. However they indicate unsystematic cases of small, scarce volumes of leech that could for example meet the needs peripheral medical sector, like the barbers and the hamams.

CHAPTER VI

CONCLUSION

This thesis consists of three parts. In the first part the general medicinal history of the leech from Greco-Roman origins until its fall in the late second half of the nineteenth century is reviewed and its theoretical underpinnings are examined. The main conclusion of this part is two-fold. Firstly, it can be concluded that leeches which are commonly associated with medicinal backwardness and folklore, were regarded and utilized as a reputable “materia medica” by scientific/academic medicine, and somehow that they kept their viable status for centuries in the midst of the shifting approaches to medical modernity. Secondly the medicinal use of leeches had acquired a more important and elevated status in the west due to some specific developments discussed in the first part of the thesis. It was this elevated status of medicinal leeches which prepared the ground for the extreme theories of Broussais and the enthusiastic and uncritical welcome they received in the rest of the Continent and America. Broussais changed the leech from a reputable “materia medica” into a rare commodity. This new perception of the leeches created a huge demand described by the contemporaries as the ‘leech craze’ and dried the European and British lakes off its leeches.

The main argument of the second part is that although the leech had been utilized in Ottoman scientific medicine since the classical times, it had never acquired the medicinal particularity it had achieved in the west. As it can be deduced from some primary sources, the leech was rather utilized as an auxiliary to scarification in the angular and internal parts of the body where it was difficult or impossible to work with a lancet. The early nineteenth century sources reveal

scarification with horns to be the most popular and esteemed method of letting blood in the Ottoman Empire. Towards the mid- nineteenth century, however, Brossais' new evaluation of medicinal leeches made a considerable impact on the Ottoman theoretical medicine turning leeches into a more popular method of letting blood. The adoption of Broussais' theories is confirmed in the memoirs of Lorenz Rigler who was appointed to be the General Inspector of all the hospitals and the Chief of the Health Office in the Ministry of Defense in 1844. This popularity was followed by an attendant increase of leech consumption in the domestic market. This domestic demand could have further been inflated by a corresponding increase in the folkloric utilization of leeches due to a possible resistance to new modern medical institutions by groups who hung onto the traditional ways.

The argument of the third part is that as the leech got scarce in European lakes and ponds towards the end of 1830's, the European merchants turned their gaze to the leech supply of the Ottoman Empire, creating a huge and almost aggressive foreign demand. This provided an unexpected but highly profitable resource of cash money for the Ottoman treasury through tax farming of leech fishery. The extent of foreign demand and the flexibility that the government adopted in order to make profit out of this demand can best be measured by the high number of European traders operating as government's tax farmers, by the assertive interference of foreign embassies, and especially by one specific case when the tax farming of all leech fishery of the Empire was leased to a company of four European traders. However, due to conflicting statements about the general volume of leech trade, it remains a question whether the government was successful in transferring most of this revenue to treasury or whether a considerable part of the gain was lost to

smuggling and theft which was, as understood, a common malpractice of the leech trade.

As a conclusion, the medical theories of Broussais seem to have triggered a period of intensive activity in the Ottoman finances created by an inflation of both domestic and foreign demand of medicinal leeches. The archival documents related to leech fishery begin to appear in the late 1830's, about ten years after the launch of the leech craze which is consistent with the scarcity of European lakes and ponds. The documents roughly disappear around 1870s which is consistent with the death of Broussais' theories and the medicinal utilization of leech due to the rise of microbiology.

The leech trade seems to be another article of commerce much like cotton, which had been induced by foreign demand triggered by the technological and scientific improvements of the west and eased by the revolution in overseas transportation, and which integrated the Ottoman Empire into an almost global network as a part of the center- periphery trade. The high demand seems to have transformed the local understandings of the medicinal leech, domestic markets and the total organization of leech fishery until another shift in western medical technology closed the brief but intense chapter of the trade.

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