

## FROM QUINAQUINA TO ‘QUININE LAW’: A BITTER CHAPTER IN THE WESTERNIZATION OF TURKISH MEDICINE\*

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Medical theory and practice in Ottoman Turkey owes much to medieval Islamic, as well as to native Central Asian and Near Eastern medical traditions. Galenic humoral pathology, which constituted the core of Islamic medicine, provided a conceptual framework of Ottoman medical teaching and practice well into the 19<sup>th</sup> century. As Ottoman physicians studied and complemented medieval Islamic works, medical knowledge and therapeutics were being transmitted from Europe and became part of the Ottoman physicians’ medical lore from the 15<sup>th</sup> century onwards.<sup>1</sup>

Blood-letting, cauterization, phytotherapy, and balneotherapy were the most common methods of treating illnesses, believed to be caused by the imbalance of the humors (*hilt*, pl.*ahlat*) of nature. Bleeding (*fasd*, *hacamat*), cupping, and ‘leeching’ were established popular practices. Treatment by vegetal and animal products was common and widespread among the populace. Some 600 vegetal drugs were named in Ottoman medical books compiled during the 14<sup>th</sup> and 15<sup>th</sup> centuries. Ottoman physicians of the era would refer to the formularies (*akrabadin*) and materia medica of ancient and medieval physicians like Dioscorides, Galenos, Ibn Sina, Ibn el-Beithar, and the Hippocratic Corpus for their prescriptions. The use of minerals as remedies (i.e.iatrochemistry) was introduced in the Ottoman Empire in late 17<sup>th</sup> century. Traditional pharmacological formulae, however, remained in circulation even after the import of specialities from Europe into the Ottoman market, and the adoption of the French Codex as the official pharmaceutical codex of the Ottoman Empire by the mid-19<sup>th</sup> century.

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<sup>1</sup> F. Günergun, Ş. Etker, ‘Medicine’, in *Encyclopedia of the Ottoman Empire*, G. Ágoston and B. Masters (eds.), New York, Facts On File, 2009, pp. 357-362

## Ottoman medical encounters with Europe and the transfer of iatrochemical therapeutics

Commerce between Italian cities and the Aegean ports of Byzantine Asia minor was well instituted by the 14<sup>th</sup> century. Following the settlement of Ottomans Turks in western Anatolia and in Constantinople in the 15<sup>th</sup> century, trade between Italy and the Ottoman cities flourished. While vegetable and mineral drugs (alum, gall nuts) were exported to Italy, medical books, simple and compound medications were brought over to the Middle East.<sup>2</sup> European physicians educated in the medical schools of Salerno and Padua came to settle in Ottoman towns, carrying along their texts in Italian and Latin alongside new medical practices and remedies.<sup>3</sup>

In the 16<sup>th</sup> century, following the expulsion of Jewish from the Iberian Peninsula by decrees issued by the kings of Spain and Portugal, a considerable number of Jewish physicians came to settle and practice in Ottoman cities, where they were allowed to profess their own religion and to treat Muslim and non-muslim patients alike. European travelers<sup>4</sup> to Asia Minor and to the Middle East witnessed the presence not only of Jewish and Turkish, but also Spanish and Italian physicians practicing in Ottoman lands.<sup>5</sup>

The 17<sup>th</sup> century saw the influx of medical knowledge from Europe. While compendia dealing with diseases and their cure by traditional remedies compiled by Islamic medical authors and complemented physicians' personal experiences remained popular among Ottomans, manuscripts introducing iatrochemical practices were compiled either through translating European texts or by consulting European physicians practicing in Istanbul. Iatrochemistry was called *tıbb-i kimyâi* (chemical medicine) or *tıbb-ı cedid* (novel medicine) because it introduced new therapies with mineral drugs not widely used in

<sup>2</sup> The printed version of Avicenna's *Canon* (Rome, 1593) in Arabic was available in the Ottoman market. Copies were extant in the library of Sultan's palace, the private collections of wealthy Ottomans and the public libraries of Istanbul.

<sup>3</sup> Ünver, Süheyl. 'Sur les relations médicales entre la Turquie et l'Italie dans l'histoire de la médecine', *Ist. Univ. Tıp Fak. Mecm.*, 18 (3), 1955, 519-527.

<sup>4</sup> The Flemish traveler Ogier Ghislain de Busbecq (1522-1592) related in his *Turkish Letters* that before leaving Istanbul in 1562, he had sent a Spanish doctor by the name of Albacare to the Island of Lemnos, and asked of him to attend the annual ceremony organized for the opening of clay beds and the production of *Terra sigillata*. This drug was much popular because of its several medicinal properties: it was used to prevent hemorrhage, heal wounds, treat ulcers and gonorrhoea, for its astringent and siccative effects. It was also recommended as an antidote in food poisoning because of its emetic properties.

<sup>5</sup> An interesting account is given in Domenico Hierosolimitano's (c.1552-1622) memoirs describing Istanbul in his years as court physician to Sultan Murad III: *Domenico's Istanbul*, trans. M.J.L. Austin, ed. G. Lewis, Wiltshire, E.J.W. Gibb Memorial Trust, 2001.

traditional Islamic medicine.<sup>6</sup> Seemingly, the private physicians to the Ottoman sultans were the first to learn about iatrochemistry and study the texts of the iatrochemical school of medicine. The Aleppo born Salih bin Nasrullah ibn Sallum (d.1699) referred to Paracelsian authors and transmitted their theories (*tria prima* and *signatures*) and prescriptions to Ottoman physicians. Moché ben Raphaël Abranavel – alias Hayatzade Mustafa Feyzi (d.1692) after his conversion to Islam – borrowed from European physician/iatrochemists such as Daniel Sennert (1572-1611), the private physician of the Prince of Saxony, Jean Frenel (1497-1558), and the French physician de la Rivière in his book on diseases and their treatment. Conveyors of iatrochemical cures and remedies, Ibn Sallum and Hayatzade pioneered also in writing on diseases hitherto unknown to the Ottomans: such as chlorose, syphilis, and plica polonica.

The head physician of the Bursa *darüşşifa* (Yıldırım Bayezid hospital), Ömer Şifai (d. 1742) attempted to write on the iatrochemical cures himself. His main works: *Tibbü'l-cedid* (Novel medicine), *Tibb-ı cedid el-kimyai* (Novel chemical medicine), *el-Fevaid-i cedide* (Novel remedies), *Minhacü'ş-şifai fi tubbi'l-kimyai* (Dispensary of cures with chemical medicine) refer to Paracelsus and are testimony to his deep interest in iatrochemical medicine. Ottoman physicians seem to be interested mostly in therapeutical and practical aspects than the basic concepts of iatrochemical medicine, that all life and disease processes are based on chemical actions.

### ***Cinchona bark and Ottoman physicians***

Prior to the introduction of cinchona bark as a febrifuge, Ottoman physicians prescribed vegetal drugs having purgative/laxative/vomitive properties, and even cooling drinks to combat various kind of fevers (*hummayat* or *ısıtma*). Bleeding (*fasd*) was also frequently recommended according to the kind of fever to be treated.<sup>7</sup> The purgatives and bleeding were also regularly used in the 17<sup>th</sup> century Europe for fevers, including malaria, and these procedures can be traced back to the Hippocratic corpus where absinth, centaury and cinquefoil were prescribed as antipyretics.<sup>8</sup> According to the ancient humoral theory, bloodletting and purgation would free the body from corrupt humors and help to expel poisons. The classification or nosology of fevers in

<sup>6</sup> H. Ebrahimnejad, 'What is 'Islamic' in Islamic medicine? An overview', in F. Günergün, and D. Raina (eds.), *Science between Europe and Asia: Historical Studies on the Transmission, Adoption and Adaptation of Knowledge*. London, New York, Springer-Vlg., (Boston Studies in the Philosophy of Science, 275). pp. 259-270.

<sup>7</sup> See, Abdülvehhâb bin Yûsuf ibn-i Ahmed el-Mardani [d.1420]. *Kitâbu'l-Müntehab fi't-Tib*. ed. Ali Haydar Bayat, Merkezefendi Geleneksel Tıp Derneği, İstanbul 2005, 163-168, 76-78; Tabîb İbn-i Şerîf. *Yâdigâr*, [Vol.2], eds. A.Alintaş, Y.Okutan, D.Koçer, M.Yıldız, Merkezefendi Geleneksel Tıp Derneği, İstanbul, 2004, 139-148, 309-317.

<sup>8</sup> Dousset, Jean-Claude. *Histoire des Medicaments*, Payot, Paris, 1985, p.43.

the Ottoman medical literature was essentially similar to that of Islamic and western medicine.<sup>9</sup>

There is no precise information when or how cinchona barks entered the Turkish compendium. Although its name is mentioned in the documents related to the commerce made between Istanbul, Venice and Marseille in the 18<sup>th</sup> century,<sup>10</sup> cinchona should easily have reached Asia Minor before this date, bearing in mind that it was introduced as early as the 17<sup>th</sup> century in India, the primary supplier of spices for the Near East.

The earliest work in Turkish introducing cinchona/quinaquina (*kınakına* in Turkish) bark and promoting its use was compiled by Ali Münşi in 1732.<sup>11</sup> Another undated and anonymous manuscript in Turkish on cinchona is kept in Süleymaniye Library in Istanbul. The manuscript was presumably written some time before 1783 when a copy of Ali Münşi's treatise and the anonymous manuscript were bound together by a medical *medrese* student.

The author of the first manuscript, Ali Münşi (d. 1733/34) had studied medicine in Bursa (Proussa ad Olympum), a town in the western Asia Minor before he entered the Ottoman Palace in Istanbul as court physician. In Bursa, he was a student of Ömer Şifai, who had written extensively on iatrochemical medicine. Ali Münşi, in the steps of his master, delved in European medical texts. He compiled two *akrabadins*<sup>12</sup> (formulary) where he frequently referred to the physician and chemist Adrian von Mynsicht (1603-1638). In all likelihood Münşi had access to Mynsicht's standard formulary *Thesaurus et Armamentarium Medico-Chymicum* (Venice, 1696) which describes in detail the preparation of medicines, either discovered by himself or used by local apothecaries. Münşi also wrote on the properties and therapeutics of ipecacuanha root, an efficient emetic and purgative used in the treatment of dysentery.<sup>13</sup> These two drugs of South American origin, hitherto unknown to

<sup>9</sup> *Yâdigâr-ı İbn-i Şerif-i İlmi Tıp* [Ms., early 15<sup>th</sup> century] ch.30. Tabîb İbn-i Şerif. *Yâdigâr*, [Vol.2], pp.139-148, 309-317

<sup>10</sup> For a list of drugs imported to Istanbul, compiled as based on the documents kept in the archives of Marseille and Venice, v. E. Eldem, 'Le commerce des herbes, drogues et épices à Istanbul (XVIII<sup>e</sup> siècle)', in *Herbes, Drogues et Épices en Méditerranée*. Actes de la Table Ronde de l'Institut de Recherches Méditerranéennes et de la Chambre de la Commerce et d'Industrie de Marseille, Mémoires et Documents No.3. CNRS Centre Régional de Publication de Marseille, 1990, p.125-138.

<sup>11</sup> Ali Münşi's treatise on cinchona has been studied and published by F.N.Uzluk. See Uzluk, F.N. 'Die Monographie über die Chinarinde von Ali Münshi Aus Bursa (?-1733/34)', *Acta Medica Turcica*, vol.7, 1955, 67-91. For a new Turkish transliteration, v. S. Ayduz, E. Yıldırım, 'Bursalı Ali Münşi ve Tuhfe-i Aliyye/Kına Kına Risalesi adlı eserinin çevirisi', *Yeni Tıp Tarihi Araştırmaları* 8, 2002, s. 85-106.

<sup>12</sup> *Bizaatü'l-Mübtedi* (A primer for beginners) and *Künâsâtü'l-Kımya* (Fragments of chemistry) were both compiled in early 18<sup>th</sup> century.

<sup>13</sup> His treatises on two other drugs *narçil-i bahri* (coconut?) and *padzehr* (?) need further study.

the Ottomans were called *efrenci* (Frankish, i.e. European) because Ottomans learned about them through European medical texts.

Ali Münşi's treatise on quinaquina is originally named *Tuhfe-i Aliye* which means "A present for Ali." It was offered to the grand vizier Hekimoğlu Ali Pasha (1689-1758), the son of the physician Nuh Efendi (Ali being both the author's and his patron's name, and the revered name of Prophet Mohammed's son-in-law, the title remained as such.) Some of its copies are simply entitled *Kınakına Risalesi* (Quinaquina treatise). The monograph begins with a foreword which relates the transport of cinchona bark from the New World to Spain and explains that the articles of Jesuit priests written in Rome have been the channel for the spreading of its name. European druggists, however, held campaigns against the quinaquina, which posed a serious threat to the traditional therapies. The writings of European doctors accounting for the benefits of this new drug, however, reinstated its usage.

Then, Ali Münşi gave a description of the cinchona tree. He noted the variations of the characters of the bark in the trees growing at different altitudes. He wrote that pure quinaquina is seldom available in Turkey as it seems to be the case in Europe. In the early years of its discovery, 1 miskal (5 g) was sufficient for the treatment of *febris periodica*, later on, 2 drachmes (6,5 g) and presently [early 18<sup>th</sup> c.] 8 to 16 drachmes (25 to 50 g) are required to treat malarial/intermittent fevers.

A chapter is devoted to the effect of the drug. Münşi presented the case of two patients suffering from 9-days and 14-days malarial/intermittent fevers. He related the experience he gained when curing patients with quinaquina in 1720 and 1725, in Bursa and Istanbul respectively, well before he penned his treatise in 1732. The chapter ended with two cases dated 1725 and 1728, quoted from a European book that Ali Münşi has studied. The dates, if correct, reveal a seemingly close and direct connection or transfer of knowledge between European and the Ottoman physicians, at least in this particular case.

Ali Münşi also discussed the advantage and the mode of administration of quinaquina, and noted that in Turkey, purgatives are used before quinaquina remedies are given. He explained how to prepare its extract, decoction and electuary in which Rose jam and Rose syrup can also be used, as proposed by Thomas Sydenham. He stressed the importance of administering the drug between two spikes of fever, and recommended to prolong its usage for some days even after the fever has subsided. Details for the preparation of enemas and ointments with cinchona and their application and dosage were given, based on doctors Helvetius and Valentini's recipes. Besides conventional antipyretic



Ali Münşi, *Tuhfe-i Aliye*, Süleymaniye Library (Istanbul) Esad Efendi MS 2483/1.

procedures such as purgatives/laxatives and cooling drinks, Ali Münşi administered quinaquina powder to his patients. Thomas Sydenham's (1624-1689) and Adrien Helvetius's (1661?-1727) treatments of fevers by quinaquina were known to him.

The anonymous and undated 18<sup>th</sup> century treatise on cinchona bark introduces the properties, the benefits, the administration (time and pharmaceutical form), and the dosage of quinaquina remedies. Cinchona bark is named *kışır-ı şeceretü'l-peruvi* or *kışır-ı peruî*, a literal Arabic translation of *Cortex peruvianus*. The administration of cinchona powder in wine is especially recommended. Pills can be prepared for those who have a sensitive stomach or abstain from wine. Emetics and purgatives can be used if necessary, especially before the drug is received. The physical properties of various kinds of barks were described in order to help distinguish real cinchona barks from others sold for cinchona. Questions pertaining to the action and administration of the drug and their effect were offered answers, together with many recommendations that a doctor requires for the treatment of the fevers. The author concluded with this personal assurance: if used in accordance with the given recommendations and under the supervision of a capable doctor, this "strange" bark or this "ciliated powder for fevers" shall aid all patients to recover their health.

Both 18<sup>th</sup> century Turkish manuscripts on quinaquina mention a good number of European authors. It is, however, clear that the source(s) of both textes were different. European authors mentioned in Ali Münşi do not appear in the anonymous text and vice versa with the exception of the Sebastiano Bado (Sebastiani Badi) who in *Anastasis corticis peruviae* (Genoa, 1663) had related the history of cinchona bark. Among the authors cited by Ali Münşi were V.F. Plempius (1601-1671),<sup>14</sup> R.Sturmius,<sup>15</sup> R.Morton (1637-1698),<sup>16</sup> M.B. Valentini (1657-1729),<sup>17</sup> G.Fonseca,<sup>18</sup> J.A.Helvetius,<sup>19</sup> L.Bellini (1643-1704)<sup>20</sup>

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<sup>14</sup> V.F. Plempius (1601-1671) who was a medical professor at Louvain had spent 30 years to translate the first two books of Avicenna's treatise *The Canon* and the chapter dealing with fevers in Book 4. Plempius's book was published in 1658 and was used as a reference manual by medical students for many years. J. Tricot, 'Vopiscus Fortunatus Plempius', *ISHM Vesalius*, 6,1, Juin 2000, 11-20.

<sup>15</sup> Rolandus Sturmius (Roland Sturm), author of *Febrifugi Peruviani Vindicarum* (Antwerp 1659).

<sup>16</sup> R. Morton is the English physician known for his study of phytisis. R.R. Trail, 'Richard Morton (1637-1698)', *Medical History*, 14,2, 1970, 166-174; R.Y. Keers, 'Richard Morton (1637-98) and his Phthisiologia', *Thorax*, 37,1, 1982, 26-31.

<sup>17</sup> Michael Bernhard Valentini (1657-1729), German natural scientist and medical professor. He was the personal physician to the Margrave of Assia in Giessen. I. Veith, 'Michael Bernhard von Valentini non-specialist in medicine and science: physician of the Enlightenment', *Bull Hist Med*, 52 (1), 1978, 96-101.

<sup>18</sup> Gabriele Fonseca, the physician of pope Innocenti X, was one of the first physicians to use cinchona.

<sup>19</sup> Jean Adrien Helvetius was the physician to the Duke of Orléans. He was the first physician to popularize Ipeca (Brazil root) in Europe as a treatment for dysentery in *Traité des maladies les plus fréquentes...* Paris 1707. F. Vidal, 'Dr. Helvetius, physician to His Royal Highness the Duke of Orleans', *Chir Dent Fr*. 1985 March 21; 55 (287):37-41.

<sup>20</sup> The Italian physician and anatomist, L.Bellini is known for his research on the structure of the kidneys. He taught medicine in Pisa in the second part of the 17th century. He was physician to the Grand Duke Cosimo III and senior consulting physician to Pope Clement XI.

and T.Sydenham. Determining the authors' contributions mentioned in the anonymous text needs further study.

Did all these names come from a single source book of an unknown author that Ali Münşi used to compose his treatise on cinchona? Or, did Münşi personally consult the books of all authors in mention? Considering the information given in the text and its arrangement, one can argue that Münşi had more than one book at hand. There is no indication as to how and where he obtained these books. Were they ordered by the palace or did he get it from European physicians living within the Empire? Was he familiar with Latin and Italian languages? If not, did he have collaborators? These questions are as yet unanswered.

The fact that Ali Münşi detailed his treatment of two patients with cinchona, and that the author of the anonymous text explained the results of his own experiences, is proof that that both texts on cinchona constitute an amalgamation of transferred knowledge from Europe and with personal experience attained personally. The structure of the texts and the information they contain suggest that these manuscripts were not written immediately after the arrival of cinchona barks in Turkey. On the contrary, they reflect a familiarization with the use of the drug and a command of the European literature. The two doctors (assuming that the author of the second manuscript is also a physician) seem to have compiled these treatises after having accumulated personal knowledge and experience to a certain level in the treatment of fevers with cinchona.

### ***“Quinine is the drug people call Solfato”***

Around 1800, chemists researched on the active component of cinchona bark. This ‘principle’ was isolated in 1819 in Jena and named “China base”. The same year, P.J.Pelletier (1788-1842) and J.B.Caventou (1795-1877) isolated the alkaloids cinchonine and quinine from grey and yellow cinchona barks, respectively. In 1820 they undertook the production of quinine [Lat. chininum] which would amount to some 1800 kilos in 1826.<sup>21</sup> As a consequence, quinine salts did not only become extensively used in Europe against fevers including malaria, but also as a tonic under various pharmaceuticals forms. This was even before the parasitology of malaria was clarified.<sup>22</sup>

<sup>21</sup> The ‘China base’ isolated by Friedlieb Runge in Jena was not different from quinine. Bernardino António Gomes, a physician in Lisbon, had isolated ‘Cinchonina’ earlier. Pelletier and Caventou are however remembered as the ‘discoverers’ of the alkaloid. F. Chast, *Histoire contemporaine des médicaments*, La Découverte, Paris, 1995, p.73-78.

<sup>22</sup> A. Laveran, *Du Paludisme*, Paris, Gauthier-Villars et fils & G. Mason, 1892, p. 122-150.

Quinine sulfate – popularised as “solfato”, short for its Italian name *solfato di chinina* – became included within the pharmaceuticals to be used in Ottoman military hospitals in the 1830s. Two lists of medicaments dated 1831 and addressed for the Ottoman troops based in Macedonia comprised each 100 grams of quinine sulfate and 300 grams of quinaquina.<sup>23</sup> Quinaquina and quinine sulfate are recorded on the order lists for the years 1835 and 1836 for the Maltepe Military Hospital, founded in Istanbul for Sultan Mahmud II’s new army.<sup>24</sup> Likewise, both drugs were included in the 1837-38 registers of the pharmacy of the same hospital.<sup>25</sup>

A pharmacopoeia translated from Italian into Greek and published in Istanbul in 1818, lists four forms of quinaquina, viz. *alcoole de chinato*, *decotto di china*, *estratto di china*, *estratto resinoso di chinina*. One can assume that quinaquina arrived in Turkey in all its available preparations, through different routes and at different times.<sup>26</sup> In 1844, the cinchona bark species used in medicine were described in the Ottoman military pharmacopoeia:<sup>27</sup> The yellow cinchona (*Sarı kınakına* in Turkish), known as royal or Calisaya, was recommended for preparing the fine powder of cinchona and quinine sulfate (*Kınakına çiçeği* in Turkish). The grey quinaquina (*Esmer kınakına* in Turkish, *Cortex Peruvianus*) was good for preparing the coarse and fine powders, as well as the aqueous extracts. Methods for preparing quinine sulfate and decoctions from the bark were also described.<sup>28</sup>

In a list annexed to the military pharmacopoeia army physicians were allotted 250 drachma (780 grams) of quinine sulfate for a regiment of 3500 persons per annum, from the central pharmacy.<sup>29</sup> According to the 19<sup>th</sup> century Ottoman statistics, the diseases most frequently treated with quinine formulas in the military were intermittent fevers, and the demand on the drug was high.

<sup>23</sup> S. Ünver, and M. Belger, ‘Yugoslavya’nın eski Osmanlı vilayetlerinde malaria tarihi üzerine rapor’, *Ist. Üniv. Tıp Fak. Mecm.*, 3 (9), 1939, 1156-1159.

<sup>24</sup> İ. Başağaoğlu, ‘Maltepe Askeri Hastanesi’, *IV. Türk Tıp Tarihi Kongresi, Kongreye Sunulan Bildiriler, İstanbul, 18-20 Eylül 1996*, Türk Tarih Kurumu, Ankara, 2003, p.213-226 (+6 pl).

<sup>25</sup> S. Ünver, ‘Türkiye malarya tarihi hakkındaki düşüncelerim,’ *Dirim*, 19 (7-8), 1944, 206-208; 20 (1-2), 1945, 34-36; 21 (1-2), 1946, 34-36.

<sup>26</sup> *Farmakopiia Genike...* [L.V. Brugnatelli, trans.] D.Pyrrou, Konstantinoupoli, 1818, p.39, 63, 74, 75.

<sup>27</sup> Charles Ambroise Bernard, *Pharmacopoea Castrensis Ottomana – Pharmacopée Militaire Ottomane*, Constantinople, 1844, p.6.

<sup>28</sup> *Ibid.*, p.37-38, 96-97.

<sup>29</sup> ‘Table indiquant les médicaments que les médecins de l’armée peuvent obtenir de la pharmacie centrale, selon les règles établies et leur quantité approximative pour un régiment de 3500 hommes pendant un an: Chinium sulphuricum – sulfate de quinine 250 drachma.’ C.A. Bernard, *op.cit.* p.131. C.A. Bernard, in his textbook of pharmaceutical botany published two years earlier than his military pharmacopoeia mentions five species of cinchona bark and referres to its tonic, febrifugal, antiperiodical and antiputride properties (C.A. Bernard, *Eléments de Botanique*, Constantinople, 1842, pp.263-64).

### *Cinchona barks and quinine salts on the Istanbul market*

The army was not the sole consumer of quinine salts. In the capital Istanbul and in many provinces of the Empire, various intermittent fevers were prevalent, especially during the summer season. Cinchona barks and quinine salts were shipped in large quantities to Istanbul from Trieste, Marseille and London. These were sold in the herbalist shops and pharmacies, and widely employed. Ready made forms of quinine (tablets, *Quina Laroche*) were also imported from Europe and sold in the pharmacies.<sup>30</sup>

Various kinds of cinchona barks or powder were available at the Istanbul herbalist shops. According to a research made in 1864, however, most of them contained only traces of alkaloids.<sup>31</sup> Medicinal cinchona barks which should contain between 14 and 37 % of alkaloids<sup>32</sup> were almost non-existent. The analysis of yellow cinchona barks, known to be the best, proved to contain traces of quinine and some cinchonine. Barks of Indian origin were occasionally sold instead of cinchona.<sup>33</sup> Georgio Della Sudda (alias Faik Pasha, 1835-1913), a renowned pharmacist of Istanbul and professor of pharmacology at the Military Medical School (Imperial Medical School), observed that cinchona barks sold in Istanbul were the barks of *Carthagenia platta*. These were devoid of bitterness and alkaloids. Barks or powder sold on the market were in the most cases rendered bitter through absorption of gentiane decoctions or by mixing aloe powder.<sup>34</sup>

Market prices also confirm the low quality of cinchona barks. The yellow cinchona barks were sold for 13-15 piasters the kilogram (18-20 piasters the oke) while in Paris, the kilogram costs 63 piasters (82 piasters/14 francs the oke). Together with transportation expenses the yellow cinchona should have been sold for over 75 piastres (100 piastres the oke) in Istanbul. This price (one fifth of the required price) in actuality corresponds to its low content of alkaloids.<sup>35</sup>

<sup>30</sup> The importation of ready made quinine preparations was prohibited in 1927 to protect the development of Turkish pharmaceutical industry. For the list of these pharmaceuticals see T. Baytop, *Laboratuar'dan Fabrika'ya*, Istanbul, Bayer, 1997, p.30-34.

<sup>31</sup> For a review of the 'Cinchona wars' in the Latin American habitat, see D. Bleichmar, *Visible Empire: Botanical Expeditions and Visual Culture in the Hispanic Enlightenment*, Chicago and London, The University of Chicago Press, 2012, pp. 145-147.

<sup>32</sup> A. Séput, 'Sur le sulfate de quinquina' (communication read at the meeting of Société de Pharmacie de Constantinople on 30 Décembre 1864), *Gazette Médicale d'Orient [GMO]*, vol.10, Mai 1866, 28-29.

<sup>33</sup> *Ibid.*

<sup>34</sup> Remarks of G. Della-Sudda in *GMO*, vol.10, Mai 1866, 29.

<sup>35</sup> A. Séput, *op.cit.* p.28.

*Pure or counterfeit? Debates on the quality of quinine sulfate*

Most of the quinine sulfate sold in the Ottoman Empire prior to World War I was imported from French, English and German producers. Herbalists, pharmacists and wholesale dealers were involved in its commerce. It was sold in bottles or by weight. Pure quinine sulfate was rarely available on the Istanbul market, although some merchants and pharmacists would import and sell it. Its use seems to have been exclusive to the wealthier patients because of its high price.<sup>36</sup> Moreover, it was not readily available in the provinces. People could unknowingly use falsificated quinine sulfate or other drugs were prescribed for the treatment of fevers. A good example is from Damascus where J.B.Latour, sanitary physician, treated intermittent fevers rather conveniently with arsenate of potassium, because of quinine sulfate was unaffordable (240-250 piasters/60 francs per ounce)<sup>37</sup> A trip to Asia Minor in 1858 revealed that peasants and villagers were exploited by the prescriptions of individuals dressed *à la franca* (after the European style) or a barber or a blacksmith/farrier, and that among the eight samples of pills analyzed, one contained pure quinine sulfate, the others holding barely amounts of salicine.<sup>38</sup>

The purity of the imported quinine salts was subject to many debates. A pharmacist in Istanbul argued that the imported quinine sulfate was pure in most of the cases, and that the dealers would mix it locally with other cheaper alkaloids which they imported from Europe separately. This mixture was put on sale under the label of any renowned European manufacturer, and sold to buyers from the provinces and even to complacent Istanbul pharmacists. The latter generally favored cheap products of whatever quality, and would examine the shape of the bottle and the weight (lightness) of the powder. Among the samples taken from twenty five "authentic" bottles only six proved to be pure. Alkaloids used in falsification were cinchonine, quinidine sulfates or salicine. The previously used falsification substances such as starch, lime sulfate, calcium sulfate were not used any longer.<sup>39</sup> Pharmacists were advised to analyze substances chemically before their purchase. Ottoman pharmaceutical journals, borrowing from their European counterparts would frequently publish new methods for determining the purity of quinine sulfate.<sup>40</sup> A pharmacist in the chemical laboratory of the Imperial Hamidiye Etfal Hospital in the capital

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<sup>36</sup> *GMO*, 1, 7, Octobre 1857, 132.

<sup>37</sup> J.B. Latour, 'Observations sur la fièvre intermittente à Damas', *Gazette Médicale de Constantinople*, 2, 7, Novembre 1850, 16-21.

<sup>38</sup> G. Della-Sudda, 'Etudes sur les falsifications pharmaceutiques IV – Du sulfate de quinine', *GMO*, vol.3, 1859, 101-103.

<sup>39</sup> *Ibid.*

<sup>40</sup> 'Essai de sulfate de quinine,' *Revue Médico-pharmaceutique [RMPh]*, 1, 2, 1888, 28.

would publish in 1903, methods to determine the quantity of alkaloids (*řibh-i kaleviyyat*) in cinchona barks and extracts.<sup>41</sup>

Falsification process did not solely occur in Istanbul or other Ottoman centres. Analyses had demonstrated that adulterated or substandard quinine sulfate from Europe found its way into the Empire. A sample taken from a bottle labeled ‘sulfate de quinine’ bought from Europe by an Istanbul pharmacist proved to be pure ‘quinidine sulfate.’ The mixture of both salts, however, was available at a lower price on the market, with a note about the real composition of the mixture.<sup>42</sup>

Dispatch of falsified quinine sulfate from Europe, led the Ottoman government to take necessary steps to prevent the exploitation of pharmacists. A note/memorandum (*tezkeres*) presented to the office of the Grand Vizier by the Military Medical School, informed the authorities that pharmacists in Istanbul have difficulties in differentiating between the pure and counterfeit quinine sulfate, and suggested that *solfatos* delivered to the customs be analyzed in the laboratory of the Medical School and banderols (stamped by the *Cemiyet-i Tibbiye-i Mülkiye / Conseil Médical Civil*) be affixed on each bottle or package. An imperial decree dated 1883 approved this proposal and entrusted the Directorate of the Military Medical School (*Tibbiye Nezareti*) with its implementation.<sup>43</sup> Subsequently, a decree was issued for the analysis of imported drugs firstly at the customs laboratories. In 1888, communications exchanged between the government and the customs administrations, showed that the Medical School neither informed them about the analytical procedures, nor sent the appropriate labels. The absence of drug inspectors in the provinces was another issue that the government had to address.<sup>44</sup> While the Medical School opposed the entrusting of municipal doctors (*ettibba-yı belediye*) with the analysis of quinine salts in the provinces, qualifying them incapable, the government sought to rely on provincial doctors (*memleket tabipleri*) or allowed these substances to be analyzed at the provincial custom offices, as before.<sup>45</sup> The Medical School’s insistence for the examination of all imported quinine

<sup>41</sup> Mehmed Ali, ‘Kinakına müstahzaratı,’ *Hamidiye Etfal Hastane-i Alisi İstatistik Risaleleri*, 4.sene 1319-1321 [Istanbul, 1903], p.135.

<sup>42</sup> A. Séput, *op.cit.*, p.28-29.

<sup>43</sup> For the memorandum of the State’s Council and the imperial decree see BOA (Bařbakanlık Osmanlı Arřivi, Istanbul), LSD 62/36-3, 1300 Ra 11 (20.01.1883) Taxes collected will be allocated to those in charge with the analytical work. In the following years, the directorate of the Medical School requested from the government that every kind of quinine salt be analyzed at the customs by the ‘‘drug inspectors’’ (*ecza-yı tubbiye müfettiřleri*), affixed with banderols and taxed. BOA, DH.MKT 1555/104, 15 L 1305 (24.6.1888).

<sup>44</sup> BOA, DH.MKT 1555/4, 1306.S.10 (16.10.1888).

<sup>45</sup> BOA, DH.MKT 1577/106, 1306. R.20 (24.12.1888).

sulfate in the Istanbul customs, their taxing and their dispatching to all over the Empire would harm, as claimed by the government, the commercial transactions and the needs of the population.<sup>46</sup>

Why did the Medical School insist that inspections be carried exclusively in the School's laboratory and then the Istanbul customs? Did the direction of the Medical School believe that analyses made in the provinces were unreliable and permissive of the infiltration of adulterated drugs in the Empire, thus harming public health? Government's correspondence with the Medical School and the customs implies that the School's concern was not purely sanitary or academic, and certain interests seem to be in play.

### ***The Zimmer Affair: French versus German standards***

In the laboratories at the customs, chemical analyses of quinine sulfate were made after the procedure given in the French Codex.<sup>47</sup> Consequently, banderols were not granted to samples which did not fulfill the requirements of the French Codex. Parcels sent from factories Poulenc (Paris) and Howards & Sons (London) were not granted the banderole, although these were recognized plants for the manufacturing high quality quinine sulfate.<sup>48</sup>

The chemical analysis of quinine sulfate seems to have been subject to endless deliberations. Various methods for detecting the purity of the salt were proposed and chemists / pharmacists did not always agree on the degree of their qualities. Arguments raised against the analysis of "Mr. Zimmer's quinine sulfate" represent not only disagreements on technical issues, but also the political, commercial and personal competition that erupted among individuals and institutions.

Conrad Zimmer, of the Vereinigten Chininfabrik Zimmer & Co. in Frankfurt, had delivered "very large" amounts to the Istanbul market in 1860s. For unknown reasons he had stopped exporting to Istanbul after some time. In early 1880s he re-dispatched a certain amount of quinine sulfate, through a certain Mr. Zehnder, a wholesale dealer in Istanbul. The drug was analyzed at the customs laboratory, reported to be pure and was bought by the owners of the Pharmacie Madella in Galata, and Mr. Kassapian, an *aktar* (druggist) in the city. The examination of the second consignment of 10 kilograms sent in 1882 was declared by the Customs to be unsatisfactory. Samples were sent to the Medical Council (*Meclis-i Tıbbiye-i Mülkiye*) to be re-analyzed in the laboratory of the

<sup>46</sup> DH.MKT 1585/81. 1306.Ca.17 (19.1.1889).

<sup>47</sup> Article X of the regulations concerning the analysis at the customs dated February 27, 1900 (26 Şevval 1317). For the French text of the regulations see 'Les analyses chimiques dans les douanes', *RMPH*, 13, 5, 1900, 52-54; 'L'entrée des médicaments spécialisés à la douane', *RMPH*, 14, 23, 1901, 276.

<sup>48</sup> 'Le sulfate de quinine', *RMPH*, 8, 9, 1895, 122.

Military Medical School. A report (July 3, 1882) issued from the School, declared that the Mr. Zimmer's *solfato* contained 4,5 % of impurities, i.e. alkaloids other than quinine. Mr. Zehnder's request for a new analysis of new samples taken from the customs was rejected by Dr. Marko Pasha (Marko Pitsipio i Apostolidis, 1824-1888), the Director of the Medical School, arguing that similar results will surely be obtained. Mr. Zehnder contacted the German Mission in Istanbul, and with the approval of the Ministry of Foreign Affairs, samples taken from the custom were sent to Mr. A. Séput, chemist/pharmacist in Pera, and to Ch. Bonkowski, the chemist of the Imperial Palace, for examination. A. Séput declared the powder pure (report dated August 10, 1882). The report (August 1/13, 1882) of Ch. Bonkowski attested that the sample held only 0,5 % of impurities and can be considered as pure. An undated report of the Sanitary Council of the German Empire stated that Mr. Zimmer's sulfate contains 0,5 % of impurities and satisfies all the conditions required in the second edition of the German Pharmacopoeia.<sup>49</sup> Mr. Zehnder, in order to contest the "erroneous assertion" by the experts of the Military Medical School, asked the German consul to intervene on his behalf for a counter-valuation.<sup>50</sup>

The counter-(re)valuation took place at the laboratory of the Military Medical School between January 31 and February 6, 1883. P. Apéry,<sup>51</sup> a delegate from the German Consulate, Mr. Zehnder, representative of C. Zimmer, and Dr. Gies, dragoman of the German Consulate met with the members of the "Commission for [Chemical] Analysis" of the Medical Council<sup>52</sup> to analyse the fresh samples received from the Istanbul Customs.

The examination of the three reports<sup>53</sup> accounting for the counter-valuation reflect the great conflict between P. Apéry advocating the purity of the

<sup>49</sup> 'Précis des travaux de la Commission Sanitaire de l'Empire Allemand, relatifs à l'analyse des échantillons de sulfate de quinine de la maison Zimmer de Frankfort', *GMO*, 27, 5, 1884, 71-77.

<sup>50</sup> 'Un dossier intéressant (suite) - II', *GMO*, 27, 7, 1884, 110-113.

<sup>51</sup> Pierre Apéry (1852-1918). Chimiste, owner of a pharmacy and a private laboratory for chemical analysis in Istanbul, Honorary Secretary of the Société de Pharmacie de Constantinople, Delegate of the Corps Pharmaceutique de Constantinople within the Conseil Médical Civil.

<sup>52</sup> The members of the 'Commission d'Analyse' were Antoine Calleja (professor of chemistry at the Military Medical School, owner of a pharmacy in Istanbul), Dr. Ömer Effendi (chimiste attaché à l'intendance de Séraskérat), Haidar Effendi (micrographe de l'École Impériale de Médecine) and Dr. Joseph Zanni (chimiste, owner of a pharmacy and a laboratory for chemical analysis in Istanbul).

<sup>53</sup> For the report addressed to the German Consulate by P. Apéry see, 'Rapport sur l'analyse d'un lot de sulfate de quinine de la fabrique de M. Zimmer, dans le laboratoire de l'École Impériale de Médecine', *GMO*, 27 (5), 1884, 66-71.

For the detailed account dated February 10, 1883 of the counter-valuation given by Dr. Gies, J.A. Zehnder and P. Apéry see "Procès-verbal de la contre-expertise sur l'analyse d'un lot de sulfate de quinine de la fabrique de M. Zimmer de Frankfort, déclaré falsifié par un mélange d'environ 4 ½ % d'alcaloïdes étrangers à la quinine par la Direction des Affaires Médicales Civiles, et confisqué à la

*olfato* and the delegates of the Medical Council insisting on its impurity. Both parties accused each other for having failed in choosing and applying the appropriate methods. The findings were interpreted in different ways. The layer that appeared between the two liquid phases was described qualitatively as an "imperceptible white layer" by P. Apéry and as "considerable quantity of flakes" by the delegates of the Medical Council. While a report would claim that from the three experiments made with the pure *olfato*, two were successful, but the third failed. The other report would ignore the unsuccessful experiment and announce only the two successful experiments. It is not clear which methods were used at the Medical School; P. Apéry argued that J. Zanni<sup>54</sup> used Liebig's method, while the report of the Medical School stated that one had referred to the French Codex. Under such statements, the interpretation of the whole "Affair Zimmer" becomes rather difficult. It is clear, however, that some of the discrepancies reported by P. Apéry were not taken into account by the delegates of the Medical Council. Yet, Apéry's claims remains open to debate.

Rivalry between J. Zanni and P. Apéry, both owning private laboratories for chemical analysis in Istanbul, may have had a certain influence on the course of the counter-valuation. J. Zanni had previously refused to act as a member of the commission, because P. Apéry, the delegate of the German Consulate was not chosen according to his taste (*le choix de l'expert chimiste délégué par le consul general d'Allemagne n'est pas de son goût*). The impelling of the director of the Medical School had obliged him to join the commission. On the other hand, P. Apéry's objections regarding the empirical way of the examinations, the impossibility of measuring the degree of the ether, the lack of instruments led to heated discussions and irritated the director and the delegates of the Medical School who accused P. Apéry of smear against the School's laboratory and its chemicals. The report compiled at the Medical Faculty following the re-evaluation, proved to be a kind of refutation of the P. Apéry's arguments, but one should also admit the chemists of the Medical Council diminished the rate of impurities from 4,5% (as previously announced) to 3,5 %.

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Grande Douane de Stamboul, conformément au rapport de la Commission d'Analyse de l'Ecole de Médecine, en date du 3 juillet 1883', *GMO*, 27, (7), 1884, 114-118; 27 (8), 1884, 131-136.

For an account of the Commission for Analysis charged by the Conseil Médical Civil see 'Rapport remis par la Commission des Analyses du Conseil Médical Civil de Constantinople sur un lot de sulfate de quinine de la fabrique Zimmer de Francfort appartenant au négociant Zehnder', *GMO*, 27 (9), 1884, 191-196.

<sup>54</sup> Dr. Joseph Zanni (Hovsep Papazyan, 1854-1934), chemist and pharmacist opened his laboratory in 1891 in the Pera district of İstanbul. J. Zanni, completed his PhD in chemistry at the Heidelberg University under Prof. Robert Bunsen.

According to Faik Pasha (Della Suda), who was himself professor of pharmacology and chemistry at the Military Medical School where the examinations were held, the reliance upon the “completely abandoned” procedure of 1866 French Codex was the main reason for the confusion. In an article in which he referred to the Zimmer Affair,<sup>55</sup> he maintained the idea that Commission’s members should follow scientific progress and adopt G. Kerner’s procedure of the German-Austrian Codex, the latter procedure being also included in the new French Codex. Moreover, they should expect to find the (industrially non-producible) chemically pure chincona sulfate, but tolerate the presence of 2 to 3 % of alkaloids, as experts of the War Ministry did earlier, prior to the issuing of banderols on the proposal of the Military Medical School. Furthermore, these should bear the inscription “*Sulfate de quinine pur officinal*” instead of “*Sulfate de quinine pur.*” The absence of tolerance, he claimed, would lead in the future to the refusal of many lots of quinine sulfate that were admitted by world hospitals.

Prof. Della Suda sen. proved right. In 1890, after the constant refusal of pure quinine sulfate of German origin by the Military Medical School, German companies, in agreement with the German Consulate in Istanbul, decided to send a chemist to Istanbul to check the examinations officially adopted at the Ottoman Customs.<sup>56</sup> In 1895, when a lot of quinine sulfate from Howards & Sons of London was held at the Customs and specimens sent to the Military Medical School for re-examination, the new director of the laboratory referred not only to the French Codex (as was the case in the Zimmer Affair), but to other methods as requested by P. Apéry and G. Della Sudda, a decade earlier.<sup>57</sup>

Deciding on the purity of M. Zimmer’s sulfate, based on the published documents is no easy matter. Already in 1880s it had given rise to heavy correspondence between the Ottoman government (Sublime Porte), German Embassy and the Military Medical School that lasted for about two years. The Zimmer Affair is, however, significant not only in demonstrating the authority of the Military Medical School and the complex relationship among the members of the pharmaceutical profession, but also for having raised scientific discussions about the analysis of quinine sulfate.

### ***The pharmacists’ rush for quinaquina***

The publication of the Turkish translation of the 1866 French Codex in 1874 in Istanbul led Ottoman pharmacists to learn more about the preparation of

<sup>55</sup> Faik Pacha [Della Sudda, Giorgio]. ‘Le contrôle du sulfate de quinine’, *La Turquie*, 19, 101, 3-4 Mai 1885.

<sup>56</sup> ‘Quinine allemande,’ *La Turquie*, 24, 91, 24 Avril 1890.

<sup>57</sup> ‘Le sulfate de quinine,’ *RMPH*, 8, 9, 1895, 122.

quinaquina's various pharmaceutical forms, among them powder, vine, extract, syrup, pills and decoctions.<sup>58</sup> By 1900, pharmacies were obliged to procure for cinchona (yellow, gray and red), salts and compounds (sulfates, chlorhydrates etc.), and various pharmaceutical and galenic forms of quinine (extract, wine, pill etc.) as well as certain brands of quinine products (e.g. *Quina Laroche*), totaling over 30 specialities altogether.<sup>59</sup> This made quinaquina the most valuable drug of prescription. Attempts were also made to grow chincona trees in the Yemen province of the Empire, in the last decade of the 19<sup>th</sup> century.<sup>60</sup>

Quinaquina fluid extract (*extrait fluide de quinaquina*) was popular among Ottoman pharmacists and European methods describing its preparation from the bark were published in Ottoman pharmaceutical journals.<sup>61</sup> Some pharmacists developed their own methods of preparing extracts. In 1890 a pharmacist in Kadıköy (Istanbul) described the instrument he used for preparing the extract and the procedure.<sup>62</sup> In 1893 another pharmacist from Istanbul published his procedure to prepare the extract named "*Essence de Quinquina*."<sup>63</sup> In early 20<sup>th</sup> century, Dr. A.J. Matcovich had produced "*Extrait fluide de quinquina special*" and "*Eau de Quinine*" in his chemical laboratory in Istanbul.<sup>64</sup> By 1929, the pharmacist Beşir Kemal would produce the extract bearing his name (*Beşir Kemal Kınakına Hülasası*) in his newly established pharmacy.<sup>65</sup>

<sup>58</sup> *Düsturu'l-edviye*, transl. Hüseyin Sabri, Mekteb-i Tıbbiye-i Şahane Matbaası, [Istanbul] 1289 (1874), pp.117, 138, 141, etc.

<sup>59</sup> "Liste et quantité des médicaments magistraux, officinaux et spéciaux, ainsi que les ustensiles qui doivent se trouver dans toute officine à partir de la date de la présente réglementation [1894], dressée par le Conseil des Affaires Médicales Civiles, de concert avec la Délégation du Corps Pharmaceutique, et approuvée par la S.Porte", *RMPH*, 11 (5), 1898, 60-63; 11 (6), 1898, 74-76.

<sup>60</sup> The proposal of Dr. Mehmet Bey, municipal physician at the province of Yemen was approved by the Ministry of Commerce and Public Works in 1888. BOA, DH.MKT 1557/70 1306.S.18 (24.10.1888).

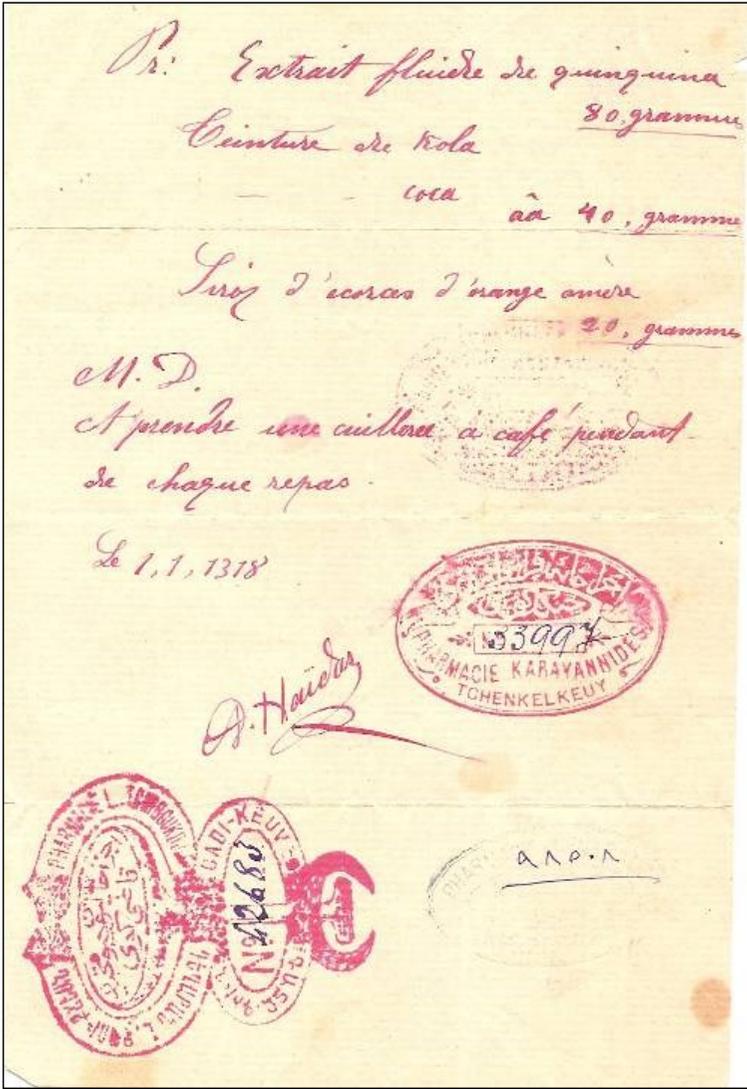
<sup>61</sup> 'Extrait de quinquina liquide de M.deVrij (from *Pharm. Centrall Un. Pharm.*)', *RMPH*, 1 (10), 1888, 155.

<sup>62</sup> A. Ergun, 'Les extraits fluides', *RMPH*, 3 (9), 1890, 150-151.

<sup>63</sup> 'Essence de quinquina', *RMPH*, 3 (6), 1890, 104; 'Extrait fluide de Quinquina - Mode opératoire par Palaiocassas Nicolas, pharmacien a Kutchuk Moustapha Pacha, Constantinople', *RMPH*, 6 (9), 1893, 128.

<sup>64</sup> Baytop, Turhan. *op.cit.* p.86.

<sup>65</sup> *Ibid.*, p.89.



A quinaquina extract prescription from 1902. Prepared in turn by the pharmacies of Karayannides (Çengelköy), and Çubukciyan (Kadıköy, İstanbul)

Cinchona syrups were prepared as well. Iskender Hamdi Bey, a pharmacist in Beirut produced a cinchona-strawberry syrup (*Çilekli Kınakına Şurubu*) and sent in 1894 to the international exposition of Anvers, for which he was awarded a gold medal with a certificate from by the Faculty of Medicine of Brussels. Another Ottoman pharmacist, Mehmet Ali Nasuhi Bey, produced in 1899 a non-alcoholic quinaquina syrup (*İspirtoşuz Osmanlı Kınakına Hülasası*)

for Muslims.<sup>66</sup> A pharmacist published in 1895 his method for preparing syrups from cinchona barks.<sup>67</sup> An enterprising pharmacist from Giresun, on the Black Sea coast, by mixing cinchona with various drugs taken from the “formularie pratique” prepared a ready made drug *Pilules de quinine indiennes* – indicating import from India or production in Indonesia, and its use was approved by the Medical Council (*Conseil Superieur de l'École Imperiale de Medecine*) in Istanbul.<sup>68</sup>

### Mosquitoes, German military physicians, and the Quinine Law

The use of quinaquina by Ali Münşi, the early 18<sup>th</sup> century court physician and his contemporaries must have been very limited. The inclusion of the drug in 19<sup>th</sup> century pharmacopeias both in Europe and Turkey, formalized and broadened and its usage. This coincided with the commercial production of chincona in plantations, and the mass production and marketing of quinine. The pathogenesis of malaria was elucidated by the end of the century and two researchers earned Nobel prizes in the field, in 1902 and 1907 respectively. The Ottoman Institute of Bacteriology (*Bakteriyolojijane-i Şahane*) in İstanbul, having close ties to the Institut Pasteur (Paris) and headed by French specialists,<sup>69</sup> closely followed scientific developments in parasitology. Research priorities, however, were largely confined to the sanitary conditions of the Capital – where stray dogs occupied the agenda.<sup>70</sup> It was only after 1914 that systematic research into malaria in Anatolia began.<sup>71</sup>

Quinine became widely known following its prescription within the Ottoman army. The new Gülhane Military Hospital inaugurated in 1898 the Asian quarter of İstanbul was under the command of German (Prussian) physicians until the end of WWI, who had their own regimen for quinine. Subsequently, the trade of quinaquina expanded within the Empire and the drug, pure or falsified, reached the periphery through suppliers/negotiators/quacks. Quinaquina was utilized in Asia Minor for the treatment of any kind of fever,

<sup>66</sup> *Ibid.*, p.22.

<sup>67</sup> ‘Préparation facile et limpide du sirop de quinquina par Nicolas Palaiocrassas,’ *RMPH*, 8 (11), 1895, 164.

<sup>68</sup> ‘Pillules de quinine indiennes préparées à Kérassunde par B.Iatropoulos,’ *RMPH*, 22 (1), 1909.

<sup>69</sup> E.K. Unat, *Osmanlı İmparatorluğunda Bakteriyoloji ve Viroloji*, İstanbul, İ.Ü. Cerrahpaşa Tıp Fak., 1970; Ş. Etker, ‘Paul-Louis Simond ve Bakteriyolojihane-i Osmani'nin Çemberlitaş'ta açılışı (21 Eylül 1911)’, *Osmanlı Bilimi Araştırmaları*, c. 10, sayı 2, (2009), s. 14-33.

<sup>70</sup> P. Remlinger, ‘Les chiens de Constantinople, leur vie, leur mort’, *Mercure de France*, no. 817, 43e Année, Tome 237, 1er Juillet 1932, pp. 24-70. Dr. Paul Remlinger was the director of the Institute between 1901-1911.

<sup>71</sup> E. Martini, İrfan İ. [Aker], Mahmut Sabit [Akalın], R. Vogel, ‘Beiträge zur Stechmücken- und Malariakunde Anatoliens’ *Arbeiten über Tropenkrankheiten und deren Grenzgebiete, Bernhard Nocht zu Seinem 70. Geburtstag gewidmet von Freunden und Schülern* (Hamburgische Universität, *Abhandlung aus dem Gebiet der Auslandskunde*, Bd. 26, 1927) pp. 286-313.

well before to the discovery of quinine's specific effect on malaria. It was also used for veterinary diseases.<sup>72</sup> Local authorities from areas devastated by malaria began to request 'solfato' from the government in Istanbul.<sup>73</sup>

In 1910, each province was allocated the sum of 15 000 piasters as *solfato parası* (monies) for the purchase of quinine sulfate to be distributed gratis to the poor patients.<sup>74</sup> The absence of local laboratories for quantifying the purity of the drug, the advantages of a purchase directly from the Dutch by auction in Istanbul<sup>75</sup> were the primary reasons for abandoning purchase and import of quinaquina by retailers.<sup>76</sup> A government announcement concerning the purchase of quinine pills (comprimés) was published the same year. Two pharmacists from Istanbul, Ethem Pertev (1871-1927) and Mehmet Kazım (1877?-1930) applied to the Medical Council stating that the import of pills from Europe would cause delays and prove expensive, and that they could deliver up to 2,400,000 pills within the 95 days of the order. Their supply of 600 kgs of quinine sulfate to Ottoman provinces should be considered as the guarantee of their commitment.<sup>77</sup> Ethem Pertev had already started to producing pills in 1900 after he bought a manual pill machine in the Paris International Exhibition.<sup>78</sup> In the summer of 1911, the government decided to undertake the selling of quinine sulfate in areas in need. This quinine sulfate would be called *hükümet solfatosu* (literally government's sulfate).<sup>79</sup>

The concept of 'State quinine' in Turkey was inspired by the Italian experience which had begun a decade earlier.<sup>80</sup> The campaign against malaria in Italy was largely supported by educational efforts, research institutes, and

<sup>72</sup> Letter dated March 20, 1864 written from Istanbul to the governor of Izmir prescribes the administration of 5 g solfato in 150 g dough to each animal affected. BOA, A.}MKT.MHM. 1280.L.11 3/3/294 /70.

<sup>73</sup> For the petitions sent from Düzce and Konya, towns in western and central Anatolia, see BOA, A.}MKT.MHM.340/57, 1282.R.07 (30.8.1865); A.}MKT.MHM.427/37, 1285.Ş.07 (21.1.1869) and A.}MKT.MHM.428/16. 1285.Ş.14 (28.1.1869).

<sup>74</sup> The quinine distributed free amounted to 2000 kgrs per annum between 1910 and 1914. This dropped to 308 kgrs in the first year of the war primarily because of transfer difficulties. In 1916 the government could provide only 608 kgrs, due hyperinflation in warring Europe, *Şihhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1058.

<sup>75</sup> By asking suppliers to lower the price successively.

<sup>76</sup> Memo (18.9.1910) sent by the Ministry of Health to the Ministry of Home Affairs. BOA, DH.ID 55/1, 1328.N.13, Lef 2.

<sup>77</sup> BOA, DH.ID 55/1, 1328.N.13, Lef 4.

<sup>78</sup> T. Baytop, *op.cit.*, p.18.

<sup>79</sup> BOA, DH.İD 55/31, 1329.B.30 (27.7.1911).

<sup>80</sup> Doktor Zeki, 'Hıfzıssıhha şubesinin 1332 senesi zübde-i mesaisi', [Şihhiye Nezareti Şihhiye Müdiriyet-i umumisi] *Şihhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1042-1051 'Isıtma mücadelesi ve Devlet Kinini'.

societies promoting the cause.<sup>81</sup> These elements did not emerge in Turkey, and the spread of malaria was tackled by quinine tablets alone.<sup>82</sup> The monopoly created in Greece on quinine dispensing set another example.<sup>83</sup>

The need for quinine increased enormously during the Balkan Wars (1912-1913) and WWI (1914-18). The most devastating epidemics during the Balkan Wars occurred between November 1912 and February 1913. A few months later, in May 1913, a regulation was issued concerning the free public distribution of quinine.<sup>84</sup> This practice restricted during the WWI.

WWI led to the general mobilisation of the population of Europe and the Middle East. People were deprived of their livelihood, and little could be afforded for the improvement of public health and welfare. Devastating epidemics came not one after another, but virtually all at once. In the Ottoman Empire fatalities from malaria alone accounted for more than all communicable diseases combined. Malaria in Turkey, unlike other European states, was both an endemic and a 'colonial' problem,<sup>85</sup> and conscription from provinces such as Syria and Baghdad exacerbated its incidence. The army sanitary corps were being refashioned after the German model and strict quarantine measures came into effect after 1915, but for practical purposes quinine remained the drug of choice for all cases.<sup>86</sup>

Germany became a main producer of quinine during WWI, and Turkey benefited to a certain extent from the supplies of its ally. The provision of quinine over vast spans of terrain, however, proved impossible, and in 1917 the Minister of War Enver Pasha issued a regulation on the prophylactic use of

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<sup>81</sup> F.M. Snowden, *The Conquest of Malaria: Italy, 1900-1962*, New Haven, Yale University Press, 2006, pp. 53-86; Giancarlo Majori, 'Short History of Malaria and its eradication in Italy with short notes on the fight against the Infection in the Mediterranean Basin', *Mediterr J Hematol Infect Dis*, 2012, 4 (1). <http://www.mjhid.org/article/view/9990> (accessed 30.08.2013).

<sup>82</sup> Dr. Milaşlı İsmail Hakkı, a 'malaria specialist' in charge of the İzmit and İznik regions, went so far as to claim that it was 'possible to eradicate malaria globally, just with the proper use of quinine, and there was no need to deal with the swamps', 'Malarya yani sıtma mücadelesi ve Kininin vaki suretde istimali', *Sihhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1144-1051.

<sup>83</sup> In Greece, 'The sale of quinine was made a government monopoly in October, 1908, since which the amount used has nearly doubled. The annual sale now amount to 8,301 kilograms, which, though sold at a very low rate brings into the government a revenue of 83,000 drachmae, or about £ 3290, or \$ 16,121', *The Orient* (Istanbul), vol III, no. 24, June 12, 1912, p. 8.

<sup>84</sup> 'Sıtmalı mahallerde fukara-yı ahaliye ve zürraa meccanen kinin tevzii hakkında Nizamname' 5 Mayıs 1329 (18.5.1913), *Düstur*, II. Tertip, c. 5, s. 506-507 (22 Cemaziyelahir 1331 / 16 Mart 1339).

<sup>85</sup> R. Deb Roy, "Quinine, mosquitoes and empire: reassembling malaria in British India", *South Eastern History and Culture*, vol 4 (1): 2013, pp. 65-86.

<sup>86</sup> H. Becker, *Äskulap zwischen Reichsadler und Halbmond: Sanitätswesen und Seuchenbekämpfung im türkischen Reich während des Ersten Weltkriegs*, Herzogenrath, Vlg.-Murken-Altrogge, 1990, pp. 46, 124-125. E. Von Düring, 'Ärtzliche Kulturaufgaben in der Türkei,' *Arch. F. Sch.- u.Tr.Hyg.*, 20 (4), 1916, 73-90.

quinine, in the designated fronts: the commander of every troop was ordered to personally supervise the administration of the drug.<sup>87</sup>

German military physicians serving in the Ottoman theaters of war were keenly interested in malaria control, and were in a position to dispense quinine in its different modalities. It was, however, becoming increasingly clear that quinine alone, either in its prophylactic and therapeutic administration, was not as effective under the given the poor conditions, and the employment of quinine caused a controversy among the German physicians.<sup>88</sup> Malaria cases exploded in 1916, following a 'wet' winter, causing as much casualty as the military operation in the southern front under the Fifth Army Division.<sup>89</sup> Deaths from malaria reported in the Turkish troops were as much as 10-fold higher (6,8 % vs. 0,5 %) than the fatalities among German soldiers.<sup>90</sup>

On the civilian side, quinine was a much sought commodity owing to its reputation as a panacea for fevers, and had already hit the blackmarket in the cities and countryside alike. People resorted to shrines and charms for malaria, where quinine or anything that resembled it was not available.<sup>91</sup> Malaria came into the political discussion after the Young Turk Revolution of 1908. New regulations had to be implemented for its provision and standardisation, and the government attempted to provide high-quality quinine at low fixed-prices through the State Agricultural Bank (*Ziraat Bankası*).<sup>92</sup> Even this 'pure quinine'

<sup>87</sup> *Birinci Dünya Savaşı'nda Doğu Cephesinde Sağlık Hizmetleri*, yay.haz. Ö. Demireğen, A. Keskin, F. İlhan, Ankara, Genelkurmay Askeri Tarih ve Stratejik Etüt ATASE Bşk. yay., 2011, s. 68-70 (Belge: Gnkur. ATASE Bşk.lığı Arşivi; Kol: BDH, Kls: 2090, Dos. 47, Fih:23).

<sup>88</sup> H. Flebbe, 'Ueber die Malaria im Taurus (Kleinasien),' *Deutsche Med. Wochenschrift*, Nr.5, 30 Januar 1919, 126-128; V. Schilling, 'Ueber relativ chinin resistente Malaria in cilicischen Taurus und Amanus,' *Deutsche Med. Wochenschrift*, Nr.17, 24 April 1919, 463-4; E. Bentmann, 'Ueber die Malaria im Taurus (Kleinasien), nebst Bemerkungen zur Bewertung der Malaria-Schutzbehandlung durch Chinin,' *Deutsche Med. Wochenschrift*, Nr.25, 19 Juni 1919, 686-689; V. Schilling, 'Über die schwere cilicische Malaria', *Arch. F. Sch.-u.Tr.Hyg.*, 23, 20-21, 1919, 475-498.

<sup>89</sup> E. Bentmann, 'Das bewegliche Seuchenlaboratorium für Anatolien', *Vor 20 Jahren, zweite Folge: von den Dardanellen zum Sues mit Marineärzten im Weltkrieg durch die Türkei*, Georg-Thieme-Vlg., Leipzig, 1935, 218-227.

<sup>90</sup> E. Bentmann, *Kriegsärztliche Erfahrungen in Anatolien*, Vlg.-Johann-Ambrosius-Barth, Leipzig, *Arch.F.Sch.-u.Tr.Hyg.*, 27, 1, 1923, 87.

<sup>91</sup> Ömer Fevzi [Öget], 'Sıtmadan niçin kurtulamıyorduk? Nasıl kurtulduk?', *Yeni Türk Mecmuası*, 1, 21-22, 1934, 1500-1503.

<sup>92</sup> The motive of this enterprise, the authorities stated, was to 'free the emaciated and helpless villagers from the cruelty of the profiteers' (...*suluk benizli biçare köylülerin yalnız bakkal, attar ve çerçi gibi muhtekir esnafın pençe-i gadr ve itisafından* kurtulub bedava ve müessir bir kinin bulabilmesi ihtimali nazar-ı dikkate alınmış', *Sıhhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1050.

was ineffective because the prospectuses were not observed. Publications on malaria containment were incomprehensible for the patients.<sup>93</sup>

Another scheme was formulated by the German military physicians, who contemplated a "Malaria tax" from which revenue would be spent on eradication:<sup>94</sup>

We believe that measures for eradication can only work if the trade of quinine is entirely prohibited, as well as its sale in the local pharmacies. If the quantity of quinine necessary for the annual requirements of a family is not distributed freely, and even if it is sold to a moderate price, the illegal trade of quinine will develop and the combat against malaria will fail or slow down. To avoid this, it is necessary to dispatch large amounts of quinine to the area in order to prevent local people to consider the drug as precious. We are not in the position to decide if the expenses can be recovered by issuing a malaria tax.<sup>95</sup>

In summer 1916, the Ottoman government passed a provisional law (*kanun-ı muvakkat*) authorizing the transfer of 50,000 gold coins (*liras*) to the budget of the Department of Sanitation (*Sihhiye Müdüriyet-i Umumisi*) to purchase quinine sulfate. The drug would be sold to the public with a marginal 15% total profit to cover the expenses.<sup>96</sup> On November 30, 1916, Chamber of Deputies (*Meclis-i Mebusan*) considered the quinine issue and a law concerning its supply and sale passed and sanctioned by the Sultan on April 4, 1917.<sup>97</sup> Again, a special fund (*faşl-ı mahsus*) was added to the budget of the Department of Sanitation for the purchase of pure quinine. In the meantime, a regulation<sup>98</sup> was issued on January 27, 1917 to organize the sale of a State Quinine (*Devlet Kinini*) or the so-called Quinine of the Ottoman Government (*Osmanlı Hükümeti Kinini*).<sup>99</sup>

<sup>93</sup> Feyzi Paşa [İzmidî], *Maraz-ı Merzagi (Sitma – Paludisme)*, İstanbul, 1913; Hamit Osman, *Sıtma (Malarya)*, Kader Matbaası, İstanbul, 1914; Tevfik Rüşdi [Aras], *İsitma*, İstanbul, Matbaa-yı Hayriyye, 1914.

<sup>94</sup> E. Rodenwaldt, and H. Zeiss, 'Malariastudien im Wilajet Aidin (Kleinasien)', *Arch. F. Sch.- u.Tr.Hyg.*, 22, 7-8, 1918, 97-129.

<sup>95</sup> *Ibid.*

<sup>96</sup> 'Kinin tedariki için 1332 Sihhiye Müdüriyet-i Umumisi bütçesine 50 000 lira tahsisat-ı fevkalade ilavesi hakkında kanun-i muvakkat. 2 Ramazan 1334 – 20 Haziran 1332 [20 Haziran 1916]', *Düstur*, 2. tertip, vol.8, İstanbul 1928, pp.1218-1219.

<sup>97</sup> 'Kinin tedarik ve furuhtu hakkında kanun, 12 Cemaziyelahir 1335 / 4 Nisan 1333 [4 Nisan 1917]', *Düstur*, 2. tertip, c. 9, İstanbul 1928, pp.628-29.

<sup>98</sup> 'Kinin tedarikine dair 2 Ramazan 1334 [3 Temmuz 1916] tarihli kanun-i muvakkatin suret-i tatbikiyesi hakkında nizamname. 14 Kanûnusanı 1332 - 3 Rebiülahir 1335 [27 Ocak 1917]', *Düstur*, 2.tertîp, vol.9, İstanbul 1928, pp.127-29.

<sup>99</sup> The texts of the legislation are given in, G Sert, E Dölen, 'Osmanlıdan Cumhuriyete Devlet Kinini', *Osmanlı Bilimi Araştırmaları*, c. XIV (2013), sayı 2, s. 69-86, and in Z. Köylü, N. Doğan, 'Birinci Dünya

In compliance with the regulation, the Ministry of Health would dispatch the quinine salts to the branches or pay-offices of the State Agricultural Bank to be sold at prices fixed by the government. As the main dealer, the state bank will sell the solfato at the wholesale price to individuals (second dealers) endowed with a permit issued by local authorities. Their number is limited by the government. The public will buy the quinine at the retail price indicated on the packages from these individuals, who will receive a fixed sum from the government for undertaking the selling of quinine. Governors of provinces or their subdivisions can act as main dealers, and local authorities as second dealers in case of necessity. In case charitable societies distribute the quinine gratis, they are allowed to buy it at reduced prices. Shops selling the quinine tablets bought from the State are asked to display the following statement: "Government Quinine - Solfato is sold here". Dealers will be inspected by state physicians and requested to purchase quinine, once 8/10 of their stock are sold out. State Quinine was sold in boxes affixed with banderols indicating the quantity, the price and posology.<sup>100</sup>

Apparently, even the State Quinine was not a commodity within reach of the populace, and particularly the most hopelessly affected by the disease: the displaced and the immigrants, who lived in squalid conditions and had not developed immunity to malaria. In 1916 the government, again resorted to distribution of free quinine tablets, which came to be known as 'Immigrant quinine' (*Muhacir kinini*). To meet this need the government imported machinery and some 5000 kg of quinine hydrochloride from Germany for a 'tablette comprimé' factory in İstanbul.<sup>101</sup>

A prospectus (*tarifname*)<sup>102</sup> describing the use of the State Quinine indicates that each tablet contained 20 centigrammes of quinine chlorhydrate (*klormaiyyet-i kinin*) and will be used before and/or after one is affected with malaria. The prospectus announces that tablets could be used both for preventing and curing malaria and gives the posology for under and above 15 years-old individuals. It reveals that not only the sulfate, but also the chlorhydrate of quinine was sold as State Quinine. Alternatively, 'Immigrant

Savařı sırasında Osmanlı Devleti'nde sıtma Mücadelesi ve bu amaçla yapılan yasal düzenlemeler', *Türkiye Parazitol Derg.*, cilt 34 (3), 2010, s. 209-215.

<sup>100</sup> The contract dated 1st March 1917 between the Ministry Health and the Agricultural Bank limits the profit margin of the Bank and agencies to 5 and 10 %, respectively, v. *Sihhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1054-1055.

<sup>101</sup> 'Kimyahane-i Osmani Dar'ül-istihzarında Komprime Fabrikası', *Sihhiye Mecmuası*, yıl 4-5, sayı 11-12, 1917-1333, s. 1193.

<sup>102</sup> For the prospectus entitled "Devlet kinininin suret-i istimaline dair tarifnamedir" see İ. Tekeli and S. İlkin, 'Türkiye'de sıtma mücadelesinin tarihi', *70. Yılında Ulusal ve Uluslararası Boyutlarıyla Atatürk'ün Büyük Nutuk'u ve Dönemi*, G. E. Kundakçı (ed.), Ankara, ODTÜ yay., 1999, p.209-255.

quinine' tablets contained the same dosis, but came in different colors and package. Quinine provision had become a major social project and challenge for the Ottoman government.

### **Conclusion**

Quinaquina was a highly valued drug for therapeutic purposes throughout the 17<sup>th</sup> and 18<sup>th</sup> centuries; probably over-valued in the absence of any effective alternative drug for febrile conditions, infectious or other. It can be argued that quinine became an index drug during the 19<sup>th</sup> century, with respect to its production, dissemination and proven indications for malaria, which was the most prevalent disease in most parts of the world.

Quinine and chincona derivatives created a vast medical literature besides a folklore, which was sometimes abused and commercially exploited. Countless products came into the local market following its mass production by the end of the 19<sup>th</sup> century. Endemic malaria allowed for experimentation with quinine, and it was found to be curative under specific conditions. The discussions around quinine and its effect on malaria provided for a refinement in the nosology of diseases. It also provided for an understanding of the environmental conditions in public health, and the social infrastructure for the provision of health care.

The Ottoman Empire spanned a geographical area where not only malaria and other communicable diseases were prevalent, but wars, migrations, trade and religious movements (such as pilgrimage) layed its people open to epidemics. That the Ottoman Government could provide quinine only by law enforcement, through an organization intended for agricultural development shows the underlying conditions of quinine trade and distribution. It must, at the same time, be accepted that quinine became an instrument of health provision by instigating arguments from different perspectives, a search for higher-quality medication, and bringing forth public demand.

At the institutional level, quinine was the subject of correspondence between the medical school, the customs, private establishments, producers, practitioners, and consumers. The pharmaceutical codex became a reference that was debated and frequently updated. Pharmacies were encouraged to prepare chincona products with added value. Quinine became the prime commercial drug in the market.

Positions of interest biased debates on quinine and malaria. Popular beliefs and customs tainted the limited efficiency of preventive cum curative

measures.<sup>103</sup> At the same time, tropical medicine became an essential discipline for empires expanding South and East. Medical records show that provision of quinine was of paramount importance for the Ottoman army in the early part of the 19<sup>th</sup> century, but more so for the people in the first quarter of the 20<sup>th</sup> century.<sup>104</sup>

In brief, quinine has contributed to the reformation of traditional medicine and the emergence of public health in Turkey,<sup>105</sup> as much as any other administrative measure. Quinine, the bitter wonder drug, is etched into popular memory, and the arduous battles against malaria,<sup>106</sup> fought through the 18<sup>th</sup> to 20<sup>th</sup> centuries within a “miasmatic” political environment, reflect a telling aspect of modernization in Turkish medicine.

### **Türk Tıbbının Batılılaşma Sürecinde Kınakına Kullanımı: Başlangıçtan ‘Kinin Kanunu’na Kadar**

Osmanlı İmparatorluğu’nda tıp teorisi ve tedavi, 19. yüzyıla gelinceye kadar Ortaçağ İslam tıbbı üzerine kuruluydu. Yeni tedavi yöntemleri ve yeni droglar, 15. yüzyıldan itibaren, Osmanlı topraklarında çalışan Avrupalı doktorlar veya Avrupa tıp kitaplarının tercümesiyle Batı’dan aktarılmaya başlandı. Ateşli hastalıkları tedavide etkin olan kullanılan Güney Amerika menşeli kınakına kabuğu, bu “Avrupa” droglarından biriydi. Kınakınayı Türkiye’de tanıtan ve kullanımını teşvik edenlerden ilk hekimlerden biri Ali Müşi (öl.1734) ise de, bu drog İslam dünyasına daha önce ulaşmış olmalıdır. Müshil ve müleyyinler, serinlik veren içecekler gibi geleneksel ateşdüşürücü yöntemler yanında, Ali Münşi hastalarına kınakına tozu da tavsiye etmekteydi.

<sup>103</sup> A. Santur, ‘Anadolu’da geçmişte bazı geleneksel uygulamalar çerçevesinde sıtma ve Atatürk dönemi sıtma mücadeleleri’, *Atatürk Dönemi Sağlık Tarihi Kongresi (1920-1938), Bildiriler, 6-9 Kasım 2007, İzmir*, M. Mutluer, E. Akçiçek (eds.), Bornova, İzmir, Ege Üniv. Basımevi, 2009, E.Ü. Edebiyat Fak., yay. no. 156, ss. 423-438.

<sup>104</sup> K.T. Evered, E. Evered, ‘Governing population, public health, and malaria in the early Turkish republic’, *J Hist Geog.*, 37 (2011) 470-482.

<sup>105</sup> Malaria remained as major problem of public health in Turkish Republic throughout the first half of the 20th century. It was the main topic of the First National Medical Congress which convened in 1925 in Ankara, the new capital. Malaria was of strategic concern, and Dr. Ahmet Fikri Tüzer (1878-1942) who, together with Dr. Abdülkadir Noyan, compiled the comprehensive report on the disease for said medical congress, was appointed interim Prime Minister and Minister of Interior in 1942.

<sup>106</sup> E. Aydın, *Türkiye’de Sıtma Savaşı*, Ankara, Türk Tabipleri Birliği yay., 1998; M. Temel, ‘Atatürk Döneminde Türkiye’de Sıtma Mücadelesi’, *Hacettepe Üniversitesi Cumhuriyet Tarihi Araştırmaları Dergisi*, Sayı, 5, (Bahar 2007), s.97-140; Fatih Tuğluoğlu, ‘Türkiye’de Sıtma Mücadelesi (1924-1950)’, *Türkiye Parazitoloji Derg.*, 32 (4): 2008, s. 351-359 [http://www.tparazitolog.org/pdf/pdf\\_TPD\\_392.pdf](http://www.tparazitolog.org/pdf/pdf_TPD_392.pdf) K.T. Evered, E. Evered, ‘State, peasant, mosquito: The biopolitics of public health education and malaria in early republican Turkey’, *Pol. Geog.*, 31 (2012) 311-323.

Anlaşıldığı kadarıyla, Thomas Sydenham'ın ve Adrien Helvetius'un ateşli hastalıkları tedavi yöntemlerinden haberdardı.

Kinin, ilk defa 1820 yılında, kınakına kabuğundan P.J. Pelletier ve J.B. Caventou tarafından elde edildi. Sıtma gibi ateşli hastalıklara karşı 19. yüzyılda Avrupa'da kullanıldı. Halk arasında 'solfato' olarak tanınan kinin sülfat, 1831 yılında, belki de daha önce, Osmanlı askeri hastanelerine girdi. Osmanlı askeri farmakopesi (1844), kınakına kabuğundan kinin hazırlanmasını ve pozolojisini vermektedir. Orduda kullanılan ve dükkânlarda satılan kınakına ve kinin sülfat Avrupa'dan ithal edilmekteydi. Ondokuzuncu yüzyılın ortasında, önemli sayıda eczanede tağşiş edilmiş kinin sülfat bulunuyordu. Yüzyılın sonunda, Osmanlı eczanelerinde 26 kadar kinin bileşiği ve kınakının değişik farmasötik formları yer almaktaydı. Safsızlık iddiaları ve kinin bileşiklerinin tağşişi ticari rekabet çerçevesinde şiddetlendi ve Tıbbiye Meclisi'nin hakemliğine başvuruldu. I. Dünya Savaşı sırasında, Osmanlı ordusunda çalışan Alman hekimler, sıtmanın andemik olduğu Güney Anadolu'da klinik araştırmalar yaptılar. 1917'de çıkarılan Kinin Kanunu, bu maddenin kalitesine ve dağıtımını düzenlemekteydi. Bu kanun ile 19. yüzyılın sonunda Türkiye'de modern tıbbi tedavinin doğuşunu simgeleyen kininin öncülüğü ortaya konmuş oldu.

**Anahtar sözcükler:** Kınakına, solfato, Ömer Şifai, Ali Münşi, tıbb-ı kimyai, Pierre Apéry, Zimmer olayı, Joseph Zanni, Kinin Kanunu, Devlet Kinini, sıtma

### **From Quinaquina to 'Quinine Law': A Bitter Chapter in the Westernisation of Turkish Medicine**

Medical theory and therapeutics prevailing in the Ottoman Empire until the 19<sup>th</sup> century were founded in medieval Islamic medicine. From fifteenth century onwards, however, new treatment modalities and drugs were introduced from West, either by European physicians practicing in Ottoman lands and/or through translations of European medical books. Trade was another vehicle of dissemination. The cinchona bark or quinaquina of South American origin proved to be an effective drug for treating fevers, and was among these "European" (*efrenci*) remedies. The earliest work introducing quinaquina (*kınakına* in Turkish) and promoting its use was a treatise compiled by Ali Münshi (d. 1734), a Turkish court physician. Cinchona bark, however, should have reached the Islamic world well before Ali Munshi's description. Besides conventional antipyretic procedures such as purgatives/laxatives and cooling drinks, Ali Munshi administered cinchona powder to his patients. Apparently, Thomas Sydenham's and Adrien Helvetius's treatments of fevers by quinaquina were known to him.

Isolated from cinchona bark in 1820 by P.J.Pelletier and J.B.Caventou, quinine became to be widely used in Europe against intermittent fevers

including malaria, in the 19th century. Quinine sulphate – popularised as “solfato” – was included among the pharmaceuticals to be used in Ottoman military hospitals in 1831, if not earlier. The Ottoman Military Pharmacopoeia dated 1844 described the preparation of quinine sulphate from cinchona bark and gave its posology. Quinaquina and quinine sulphate employed in the military and sold in the drugstores were imported from Europe. In mid-nineteenth century, quite a number of apothecaries would sell counterfeited quinine sulphate, as well. By the end of the century, the list of pharmaceuticals that should be kept in Ottoman drugstores counted about twenty-six quinine compounds and pharmaceutical forms of quinaquina. Allegations of impurities and adulteration in quinine compounds were exacerbated by commercial competition, and necessitated for the arbitration of the Imperial Medical Council. Quinine became widely available and its indications specified following its large scale, yet monopolistic, production in South-East Asia, and the elucidation of malaria parasitology. During World War I, German physicians serving under the Ottoman command undertook clinical research in Southern Anatolia/Asia Minor where malaria was endemic. A “Quinine Law” issued in 1917 enforced control over the quality and distribution of the substance, and established the priority of the drug which symbolised the evolution of traditional Turkish medicine at the turn of the 18th century, and signified the emergence of modern medical treatment with pharmaceuticals at the close of the 19th century, heralding the westernisation of Turkish medicine.

**Key words:** Cinchona bark, quinine, quinaquina, solfato, Ali Münři, Ömer Şifai, Pierre Apey, Zimmer affair, Joseph Zanni, Quinine Law, State Quinine, malaria, iatrochemistry, therapeutics.