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The Uses of Honey in Abū al-Ḥasan al-Ṭabarī's *al-Muʿālajāt al-Buqrāṭīyah*

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Abstract

The medical compendium attributed to 10th century physician Abū al-Ḥasan Aḥmad b. Muḥammad al-Ṭabarī entitled *al-Mu'ālajāt al-Buqrāṭīyah* (or *The Hippocratic Treatments*, hereafter referred to as MB) is a text of historical importance which remains relatively understudied to this day. Whilst previous research into MB has been primarily centred on illuminating Abū al-Ḥasan al-Ṭabarī's most notable contributions to the field of medicine and on the production of partial critical editions, the present thesis aims to enquire into the *materia medica* of MB for the purpose of elucidating the ways in which a particular medical substance, namely honey, is used in the treatment of disease and illness in the text. With reference to three manuscripts of MB, each mention of honey in books 2-5 of the text has been studied with the aim of determining the individual and general uses of honey in those books.

This thesis is divided into four parts. The first part presents the scope of the study along with a comprehensive contextual background and details the methodological underpinnings of the study. The second part sets forth the results of the study. In the third part the results of the study are discussed. Finally, part four concludes the paper with recommendations for further avenues of study.

Keywords: al-Mu'ālajāt al-Buqrāṭīyah, Abū al-Ḥasan al-Ṭabarī, materia medica, manuscript studies, medieval medicine,

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Note on transliteration

Transliterations provided in this work comply with Brill's transliteration system except for in direct quotations. The following table is adapted from Brill's *Encyclopaedia of Islam* transliteration guidelines[1].

ء	ʾ	ق	q
ا	ā	ك	k
ب	b	ل	l
ت	t	م	m
ث	th	ن	n
ج	j	ه	h
ح	ḥ	ة	a;-at in iḍafa
خ	kh	و	ū
د	d	ي	ī
ذ	dh	Short vowels	a;i;u
ر	r		
ز	z		
س	s		
ش	sh		
ص	ṣ		
ض	ḍ		
ط	ṭ		
ظ	ẓ		
ع	ʿ		
غ	gh		

[1] Brill's transliteration guidelines were accessed in May 2023 at the the following web-document: https://brill.com/fileasset/downloads_products/27684_EI3-Instructions-for-Authors.pdf

1 Introduction

The medical compendium entitled *al-Mu'ālajāt al-Buqrāṭīyah* (hereafter MB) is a 693 page text[2] attributed to the 10th century physician Abū al-Ḥasan Aḥmad Ibn Muḥammad al-Ṭabarī. To this day MB remains unedited in its complete form and is extant only in the Arabic language. Such is the case for the countless numbers of manuscripts emanating from the earliest periods of Arabic-language literary history and beyond, which remain scattered around the world in libraries, institutions and private collections - to say nothing of those that remain undiscovered. These manuscripts are preserved with varying degrees of safe-keeping and even in cases where works are well-preserved and catalogued, it is not uncommon for them to be unattributed and unidentified. Beyond the information contained within these manuscripts which may be revealed through concerted efforts to study them, their potential to inform us about the material culture of not only of Arabic society but also of the surrounding societies, both geographical and temporal, is immense. It is within this context that the importance of the study of these manuscripts becomes manifest. Works like MB are uniquely poised with respect to their ability to contribute to our understanding of the history of medicine and the various influences that impacted the development of an Arabic-language medical corpus including ancient Greek medicine, Persian traditional medicine, Indian traditional medicine (Ayurveda) and prophetic medicine[3].

The factors that have led to many manuscripts remaining unstudied are numerous, not least of which is the practical challenges of working with handwritten texts. The process of working with Arabic handwritten texts can be time-consuming and laborious. In the case of working towards a full-critical edition it often requires researchers from various fields and specialisms in addition to researchers who are well trained in Arabic philological practices with an expert understanding of classical Arabic. The steps are manifold and require complex expertise and many man-hours. Moreover, there also exist barriers to access given that many manuscripts are part of private collections, may be restricted for public access or may be located in regions where, for one reason or another, travel might be difficult. This makes the efforts towards digitisation of manuscripts all the more pertinent. In spite of all this the rewards are clear. In studying these texts we gain a deeper appreciation of not just the texts themselves but also the individuals that contributed to their production and the societies in which they were produced.

[2] Page numbers according to Sezgin's 1990 facsimile reproduction.
[3] For a comprehensive study into the prophetic medicine tradition see: Perho, 1995.

Despite its relative oversight in the realms of academic study, MB is recognised as an important early Arabic language work within the field of medicine which makes the absence of an exhaustive study all the more glaring. That is not to say that there has been any lack of interest in Abū al-Ḥasan al-Ṭabarī and his work. There have been several recent studies[4] that have centred around MB in particular. Previous research on MB has focused on al-Ṭabarī's notable contribution to the discovery of the scabies mite[5], his work on ophthalmology and his emphasis on professional ethics within the medical field[6]. Even as far back as the the 19th century, German ophthalmologist Julius Hirchberg published a study of the third book of MB which deals with ocular diseases[7]. A similar study of book seven with a partial translation was published in 1927[8] by Mohamed Rihab. More recently, Qalaji and Al-Wafai produced a partial critical edition of some sections of MB on diseases of the eye[9] and in 2010 a research project at Lund University's Centre for Languages and Literature aimed to conduct a survey of the text resulted in further publications[10]. It is with the expressed aim to further contribute to our understanding of MB and add, however modestly, to the repository of knowledge of medieval Arabic manuscripts that this thesis proceeds. It is also the case that this thesis may be of relevance to fields related to the study of honey itself on account of the enduring cultural significance of honey[11].

Whilst much of the previous research into MB has been primarily focused on learning about its author and translating and producing critical editions of sections or books of the text, the present study aims to explore the way in which honey is used in books 2-5 of MB. Over the course of this work, each individual mention of honey in books 2-5 of MB has been determined and examined with the aim of identifying the specific uses and applications of honey. The enduring significance of honey on a historical and cultural level, which will be further discussed in section 1.2, made it a substance of interest for further study. In total six different types or forms of honey are mentioned in books 2-5 of MB, with some types of honey being solely mentioned in one specific book or treatment. Given the nature of the text, the uses of honey were found to have medicinal applications and intended to be used in the treatment of disease. I found that in books 2-5 of MB, honey is used in the treatment of 24 distinct diseases over different areas of the body including the skin, brain, eyes, nose and ears. Additionally, this work lead to the delineation of three approaches to treatment that honey is utilised as a part of namely: prescriptions, regimens and practical

[4] See: Ambjörn, 2011; Ambjörn, 2016; Ambjörn, 2017; Ghaffari et al., 2014; al-Kadaan, 2014; Qalaji and Al-Wafai, 1998
[5] Friedman, 1938:163-176
[6] Alni et al., 2018; Azmi and Siddiqui, 1999;
[7] Hirschberg, 1889:107-114
[8] Rihab, *Der arabische Arzt Aṭ-Ṭabarī,* 1927
[9] Qalaji and al-Wafai, *Amrāḍ al-ʿAyn wa Muʿālajātuha*, 1998
[10] Ambjörn, 2011:103-112
[11] This will be expanded upon in section 1.2.1 *Cultural Context, Honey*

treatments[12]. Determining the context of each mention as well as identifying the semblant organisational features of the manuscripts lead to the revelation of these specific approaches to treatment. Furthermore, this work has found that honey is utilised in at least 17 different pharmaceutical forms, in some cases as possibly as an active substance and in other cases as an agent to bind or meld other substances together into specified pharmaceutical forms.

General overview

This thesis is divided into four chapters. The current chapter is an introduction and includes a cultural background to honey, biographical information about the author of MB, detailed information on the source material, a brief section on reference works and finally an outline on the methodological framework with a reflection on its limitations. Chapter two presents the results of the study**.** Chapter three offers a thorough account of the results of this paper. Finally, chapter four offers conclusional remarks and reflections on potential avenues for further research.

1.2.1 Cultural Context, Honey

From its use in ancient rituals, its importance in many of the ancient medical traditions and its use as a sweetener up until the present day, the use of honey throughout history is well-documented. For at least ten-thousand years humans have been consuming honey[13]. It has even been posited that the consumption of honey goes back even further than this and that its consumption of critical importance to human evolution[14]. Before its wide-scale propagation, honey was hunted in the wild and its significance to early man is suggested by the fact that he would go to considerable lengths to obtain it as shown in cave paintings depicting a person climbing a ladder to reach a beehive to extract honey[15]:

[12] More about how these categorisations were determined and their definitions may be found in sections 1.5.5 and 2.
[13] Ransome, 2004:21.
[14] Crittenden, 2011:257-273.
[15] *Findings of a cave painting with the best scene of honey harvesting in the Levantine art* (2021) (Accessed online on 10 June 2023 https://www.ub.edu/web/ub/en/menu_eines/noticies/2021/07/012.html)

Figure 1: Cave Painting

Honey and bees are mentioned in the earliest literature that we have available to us. The cuneiforms of the Sumerians, the Hittite laws, and the Vedas all make mention of bees and honey[16]. The use of honey as a vehicle for administering other medicaments is attested in a 5000 year old Sumerian cuneiform tablet[17]. Furthermore, the use of honey as a medicament "figures largely in recipes in the Medical Papyri"[18] [19]of Ancient Egypt, whose physicians were "aware of its healing properties"[20]. It is also around the time of the Ancient Egyptians, where honey was used across all strata of society, that the organised large-scale cultivation of honey has its roots[21].

Throughout antiquity the reverence of honey persisted. The ancient Greeks claimed honey to be "*ros caelestis"* ("heavenly dew") which fell from the upper air onto flowers, from where the bees collected it."[22] Popular uses of honey in ancient Greece were as a drink called mead (fermented honey wine) or in the medical preparations hydromel, which is unfermented honey wine, and oxymel, a medicinal mix of honey and vinegar[23]. Oxymel and hydromel are the most common uses of honey in the Hippocratic Corpus[24] with oxymel being used to treat pain and hydromel to treat fever[25]. Oenomel, composed of wine and honey, was another popular preparation of honey[26]. Beyond its use in preparations, honey features in the Hippocratic corpus as a topical treatment for ulcers and haemorrhoids and it was also used in wound plasters and in uterine pessaries.[27] Taken internally honey was prescribed as a treatment for scurvy and

[16]Ransome, 2004, 24.
[17] Teall, 2014
[18] Ransome, 2004:24.
[19] For more on honey in ancient Egyptian medical papyri see: Jones, "Honey and healing through the ages", *Journal of ApiProduct and ApiMedical Science* (2001)
[20] Ransome 2004:24.
[21] Germanido, "The Ancient Lands of Honey: Middle East, Egypt, Greece" *Friends of ASOR* VIII, 2020
[22] Cilliers and Retief, "Bees, Honey and Health in Antiquity" *Akroterion* 53, 2008
[23] Cilliers and Retief, 2008:10
[24] Cilliers and Retief, 2008:10
[25] Eteraf-Oskouei and Najafi , *Traditional and Modern Uses of Natural Honey in Human Diseases,* 2013 (Accessed online on February 2023 at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3758027/)
[26] Eteraf-Oskouei and Najafi, 2013
[27] Cilliers and Retief, 2008:11

distension[28]. From this period and even into the middle ages honey was known to refer to both bee honey and other 'honeys' made made from fruits like dates, grapes and carob[29].

Honey also features frequently in religious scriptures, including the Vedas, the Torah, the New Testament and the Quran, where the virtues of honey are often extolled and it reaches a symbolic status. The Quran devotes an entire chapter to the bee, wherein it describes honey as a drink that comes from the belly of the bee and "in which there is healing for people."[30] Honey is also of primary significance in the prophetic medicine tradition, which arose in resistance to the influence of medical ideas from Hellenistic society that had been taken up by early Islamic society. Honey is considered with such reverence that it is compared to scripture in regards to its healing potential[31]. However the religious reverence for honey is not universal. In the ancient writings of Zoroastrianism, bees are categorised as a noxious creature and by extension honey was not viewed favourably[32].

1.2.2 The Author: Abū al-Ḥasan Aḥmad b. Muḥammad al-Ṭabarī

The physician Abū al-Ḥasan Aḥmad b. Muḥammad al-Ṭabarī lived and practised during the 10th century. The exact dates of his birth and death are unknown though it is speculated that they occurred somewhere between 916-985 CE[33]. Further biographical details about life of Abū al-Ḥasan al-Ṭabarī are scant but it is known that he served as court physician to the Buyid ruler Rukn ad-Dawla (r. 935-976 CE)[34]. Additionally, it is known that he studied under Abū Māhir Mūsā b. Yūsuf b. Sayyār and that he was a contemporary of the physician and psychologist 'Ali b. al-'Abbās al-Majūsi (also known as Haly Abbas).

In spite of the dearth of biographical information presently available to us, Ambjörn highlights the potential for MB to serve as a source for the creation of a detailed biography of Abū al-Ḥasan al-Ṭabarī stating that "MB provides information that makes it possible to map the approximate area in which he was active, get an idea of which people he met and worked with, what medical and philosophical literature he had studied, the cases he was confronted with in his clinical work, as well as many other things." [35] This

[28] Cilliers and Retief, 2008:11
[29] Lev & Amar, 2008:186
[30] The Quran, sūrat l-naḥl (16:69)
[31] *"Make use of the two remedies: honey and the Qur'an.",* Mishkat al-Masabih 4571
[32] Daryaee, "Honey: A Demonic Food in Zoroastrian Iran?" *Studia Litteraria Universitatis Iagellonicae Cracoviensis*, 2019:54.
[33] Ghaffari at al, 2014
[34] See: Ibn Abī Uṣaybiʿah, The Best Accounts of the Classes of Physicians, (11.6) (Accessed online on February 12 2023 at https://doi.org/10.1163/37704_0668IbnAbiUsaibia.Tabaqatalatibba.lhom-tr-eng1)
[35] Ambjörn 2011:104

potential is evidenced in a recent paper[36] which highlights that in in MB, Abū al-Ḥasan identifies Yaḥyá ibn ʿAdī as his master.[37] This connection between Abū al-Ḥasan al-Ṭabarī and the prominent Christian philosopher is not highlighted in any of the earlier biographical entries on Abū al-Ḥasan al-Ṭabarī and deserves more attention. Through further study of MB it is possible that additional connections of this kind can be identified.

The study of MB has a number of practical applications. In addition to the potential of MB to help form the basis of a biography of its author, Ambjörn highlights MB's value as a source for study for its potential to further our understanding of medical practice at the time stating:

> One of the features that make MB particularly valuable as a source is the constant presence of a practical, clinical perspective: many case histories are reported and the text allows the reader to follow the activities of a clinically active physician and get an idea of the problems he – or she, female practitioners are mentioned – is confronted with.[38]

Abū al-Ḥasan al-Ṭabarī's diligence in documenting his activities makes MB a source of particular interest within the field of medical history.

When it comes to Abū al-Ḥasan al-Ṭabarī's contributions to the field of medicine one of his most significant contributions is the discovery of the parasite which causes scabies[39]. In addition to this, his writings on ocular migraines (*shaqīqat al-'ayn*) in MB appear to have been amongst the important contributions to the field of ophthalmology from the Arabic language medical works of medieval period[40].

A number of texts are attributed to Abū al-Ḥasan al-Ṭabarī[41] most of which are lost and some that exist only as extracts included in MB. However Sezgin identifies three of al-Ṭabarī's texts that still remain which are *Risālah fī Ḏikr al-qārūra* (Treatise on Urology), *'Ilāj al-atfāl* (The Medical Treatments of Children) and *Maqāla fī Ṭibb al-'ain* (Book on Ophthalmology)[42].

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[36] Wakelnig, "Al-Ṭabarī and al-Ṭabarī Compendia between Medicine and Philosophy" *Philosophy and Medicine in the Formative Period of Islam*, 2017
[37] Wakelnig, 2017:249
[38] Ambjörn 2011:103
[39] Friedman 1938:163-176
[40] Leffler, 2015: 207-215.
[41] Ghaffari at al, 2014
[42] Sezgin, 1995:308

1.3 Source Material

MB is the 10th century medical encyclopaedia attributed to Abū al-Ḥasan al-Ṭabarī. It was compiled in its initial iteration around the year 950 CE preserved to this day in 21 separate manuscripts[43]. Three of these manuscripts have been reproduced for open public availability including one printed facsimile reproduction[44] and two digital facsimiles.

1.3.1 The Text

al-Muʿālajāt al-Buqrāṭīyah (MB)

The first book (*maqāla)* of MB is a philosophical introduction wherein "the author aims at giving his work a firm philosophical, i.e., in this context, scientific, basis."[45] Abū al-Ḥasan al-Ṭabarī also uses this introduction to distinguish himself from his contemporaries and to object to those physicians who "abandon the use of basic laws in their diagnosis and their medication as laid down in the books of the ancients, contenting themselves with the consultation of contemporary manuals."[46] It is according to this sentiment that Abū al-Ḥasan al-Ṭabarī wished to emulate the rigour of the ancients in his magnum opus, which is reflected in its title which can be rendered in translation as "The Hippocratic Treatments" .

The books of MB deal with diseases that occur in a specific area or system of the body in descending order, beginning with the head and ending with the excretory organs. This is in deviation from the standard arrangement of the time where medical treatises were arranged '*a capite ad calcem*' or from head to foot. Each of the books is divided into chapters which number 472 in total. Most of these chapters share a similar structure[47] which consists of a brief explanation of the disease itself which is then generally followed by a description of the treatment which may consist of references to case histories or other physicians and their works.

[43] Sezgin 1995:308
[44] al-Ṭabarī, *al-Muʿālağāt al-Buqrātīya*, facsimile ed. (1990)
[45] Ambjörn 2011:103
[46] Sezgin, 1990:VI
[47] A systematic study of the way that chapters are structured in MB, though out of the scope of this thesis, warrants further study.

Finally there is usually a subsection on prescription(s) that are recommended for treatment of symptoms. The titles of the ten books [48] in MB are:

1) Philosophical Introduction
2) Illnesses of scalp and skin of the face
3) Illnesses of the brain
4) Illnesses of the eyes
5) Illnesses of the nose and ears
6) Illnesses of the oral cavity, including the teeth
7) Illnesses of the skin of the body
8) Illnesses of the respiratory organs
9) Illnesses of the oesophagus and gastric ventricle
10) Illnesses of the excretory organs

With further regards to the structure of MB, the individual chapters generally follow a similar structure[49]. In both the British Library (BL) manuscript and Osler Library (OL) manuscript[50], this structure is made clear through the use of red ink[51]. The use of red ink may have been an editorial decision made at the prerogative of the scribe in order to indicate some kind of structural regularity in the chapters and chapter titles are written or underlined in red ink, so as to distinguish them from the main body of the text[52]. The red handwriting and underlining is exemplified in figures 2 and 3.

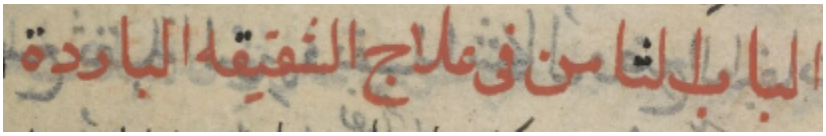

Figure 2: Chapter title from British Library Manuscript

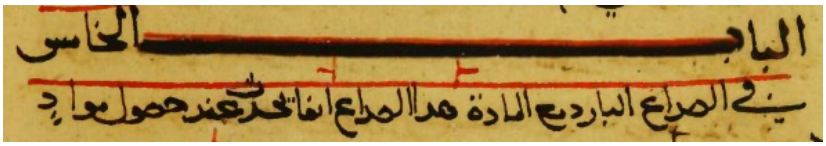

Figure 3: Chapter title from Osler Library Manuscript

[48] These book titles are not direct translation but rather an indication of the book content. They are reproduced here based off of the translations offered in Ambjörn, 2011:103.
[49] This structure does exhibit variation however this summary intends to give a general picture of the most common book structure.
[50] Both these manuscripts will be discussed in more detail in section 1.3.2.
[51] It should be noted here that although the writing of chapter titles in red ink is fairly regular, they are also written in black regularly too.
[52] It is unclear if these are also marked in red ink in the source manuscript of Sezgin's printed facsimile due to the manner in which it was copied.

All chapters begin with a title and an introduction describing the disease and its name. This introductory section may also provide background of the disease including references to other physicians and their statements on the disease and can range between a few lines to most of a whole page. The remainder of the chapter is usually variably divided into three other subheadings treatments, prescriptions[53] and symptoms. In all three manuscripts, these are identified in the text body with 'subheadings'. In the printed facsimile, these are mostly indistinguishable from the rest of the text; however the BL manuscript uses red ink to demarcate headings and subheadings, as demonstrated in figures 2 and 3. As for the OL manuscript, subheadings are sporadically indicated through emphasis via elongation of the word in comparison to the surrounding text. It should be highlighted here again that this emphasis in the form of different ink colours and elongation might be a scribal addition and without further research it isn't possible to claim that these subheadings have any bearing on the text as a whole. This elongation is exemplified in figures 4 and 5.

Figure 4: Elongated *'Treatment'* subheading in OL manuscript

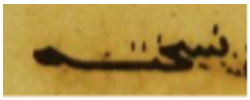

Figure 5: Elongated *'Preparation'* subheading in OL manuscript

Sezgin offers an explanation of reasoning behind Abū al-Ḥasan al-Ṭabarī's choice of how to structure the books in MB, stating that al-Ṭabarī models his descriptions of diseases and their treatments based on the approach of Hippocrates:

> He thus wrote his book and named it al-Muʿālajāt al-buqrāṭīyah, indicating thereby that he was following the path of Hippocrates in his description of diseases dividing them into categories "from genus (*jins)* to species (*naw'*)" and finally "to subspecies (*naw' al-anwā'*) and to the last, indivisible number one", intending furthermore to compare "every medication with the basic laws pertinent to it", and to explain "how the physician has to cause (*al-sabab al-bādi'*), and the 'arriving' cause (*al-sabab al-wāṣil*)." He wishes to compose a book "which perfectly combines theory and practice", balancing, so to speak, theory and experience of medical art. [54]

[53] Any given book might contain several sections of prescriptions and or treatments, in varying orders.
[54] Sezgin, 1990:VI

1.3.2 The Manuscripts

MS Malik Milli

The primary reference material for the present study is volume one of the facsimile print[55] of the manuscript which was published by Sezgin in 1990. It was reproduced from MS Malik Millī Library (Tehran) 4474 which was copied in 1479 CE. It consists of two volumes of handwritten text with each volume comprising five books. Regarding the handwriting Sezgin describes it as "difficult to read and full of scribal errors."[56]

British Library (BL) Manuscript

In addition to the printed facsimile, the two digitised facsimiles of the manuscript were consulted extensively for cross-referencing. The first of these copies is held in its physical form in the Oriental Manuscripts collection at the British Library[57] and accessed digitally via Qatar Digital Library. Qatar Digital Library provides a detailed description of the manuscript stating that it was copied in the *naskh* script between the years 1705-1709 CE by the scribe identified as Kāẓim (كاظم) . The handwriting of this manuscript may be described as more legible than that of the facsimile edition. This legibility is aided by its digitisation which facilitates the ability to enlarge more clustered portions of the text whilst still maintaining the text's visual integrity. Much like the printed facsimile, this manuscript also suffers from a significant amount of scribal errors.

Osler Library (OL) Manuscript

The second digitised facsimile that was consulted for cross-referencing is an incomplete manuscript held in its physical form Osler Library of the History of Medicine[58] at McGill University. It was digitised by McGill University and made accessible through the Internet Archive. The manuscript was copied in Marv (Marw) in 1215 AD and displays features of the Maghribi script[59]. It is missing the first folio entirely and repairs to the four final folios has led to some additional text loss[60]. In the online listing of this volume on

[55] Sezgin, "Editors Introduction" in al-Ṭabarī, *al-Muʿālağāt al-Buqrātīya*, facsimile ed., 1990:V-IX
[56] Sezgin, 1990:VII
[57] Identified in GAS as London, Ind. Off., Or. 1296
[58] Gacek, 2009:134.
[59] See Gacek 2009:134. Gacek notes the handwriting style of this manuscript as a prime example of divergence of script style and region. The Maghribi script is atypical to the region in which this MS was copied in Marw (the historical region of Khurasan).
[60] Gacek 2009:134

the WorldCat database[61], notes on the microfilm of the manuscript are attributed to one W.W. Francis[62] and states about the manuscript that it is "on paper which looks much more recent than A.H. 611, A.D. 1214, the year the copyist says he finished it[63]. Contains the first 3 of the 10 books or treatises consisting the whole work."

1.4 Reference Works

A number of works have been consulted extensively throughout the process of this thesis. Ibn Sīnā's Canon of Medicine, which is a contextually adjacent material with several partial translations, has been instrumental in aiding with understanding key terms and concepts. Lev and Amar's *Practical Materia Medica*[64] has been particularly useful for its detailed monographs (including one on honey itself) of various substances that are mentioned along with honey in MB and its practical information on the medical uses of various substances. There are also number of glossaries of *materia medica*[65] and technical terminology in Arabic that have served as indispensable resources, including those included in two of Ambjörn's works[66] and in an article by Max Meyerhof[67].

1.5 Method

This section details the methodological process employed by this thesis in the form of a working methodology. Initially, I will describe the preliminary steps which included selecting a text and finding source manuscripts. Next, I detail what went into the preparatory phase of including the selection of a suitable substance to focus the research on and defining the scope of a mention of honey. I then go on to discuss the practical stage of working directly with the text which broadly includes examining and

[61] The WorldCat database entry for the OL manuscript was accessed online on May 24 2023 via the following link: https://mcgill.on.worldcat.org/search/detail/428077129?sortKey=DATE_A&databaseList=638%2C283&queryString=Arabic%20Manuscript&changedFacet=scope&clusterResults=on&stickyFacetsChecked=on&subscope=wz%3A12129%3A%3Azs%3A37888

[62] William Willoughby Francis (W.W. Francis) was Osler Library's first Librarian.

[63] W.W. Francis brings into question the dating of the manuscript thereby highlighting the need to approach the not just manuscripts themselves but the information provided regarding them with a degree of vigilance. With advances in the forensic dating of historical documents it may be yet possible through paper and ink analysis to enquire into the question of the manuscript's dating.

[64] Lev and Amar, *Practical Materia Medica,* 2008

[65] ibn Janāḥ, *On the Nomenclature of Medicinal Drugs* (2020); Avicenna, *The Canon of Medicine Volume II: Natural Pharmaceuticals* (2012); Fellmann, *Das Aqrābādhīn* (1986); Bedevian, *Illustrated Polyglottic dictionary of plant names* (1936); Maimonides, Rosner, *Moses Maimonides' Glossary of drug names* (1979); Bos, *Maimonides: medical aphorisms glossary & indexes* (2021)

[66] Ambjörn 2000 & Ambjörn, 2007

[67] Meyerhof, 1931

deciphering the text through both contextual and comparative analysis. Finally, I consider the limitations of the working methodology as a whole and also touch on the broader limitations of working with handwritings of this nature.

1.5.1 Text Selection

The choice of which text would form the basis of this thesis was decided with regard to two primary concerns. These were that it should be of interest and that it should be relevant. MB is a text that I had previously worked with during my masters studies and it stood out as an obvious candidate with regards to these central concerns. That MB was both of interest and relevant for the purposes of the current thesis can be demonstrated by the fact that it is the subject of recent and ongoing research by researchers from numerous fields across the world. Access to Lena Ambjörn's working paper of a *materia medica* index (hereafter MMI) of MB also confirmed the potential of MB for further study and demonstrated the scope of research that was possible. This would include the study of specific medicaments from a treatment approach as differentiated from the previously explored avenues such as the disease-centred approach[68].

1.5.2 Finding Source Manuscripts

Following the decision to study MB, it was then important to locate and access a manuscript that could be consulted as the primary source of data. In terms of accessibility, completeness[69] and the fact that it was used as the primary reference for the aforementioned MMI[70], the Malik Milli manuscript (as reproduced in Sezgin's facsimile edition) was the most suitable available primary source manuscript for the purposes of this thesis. Due to the poor readability of the facsimile edition of MB it was soon determined that it would be of benefit to be able to consult as many sources as possible in addition to it. As the scope of the research was dependent on being able to comprehend the relevant excerpts of text in order to piece together the best interpretation possible it was important to be able to consult multiple manuscript sources in tandem in order to bolster or eliminate certain readings. Sezgin's index of Arabic manuscripts *Geschichte des Arabischen Schrifttums* (or GAS) identifies the existence of numerous manuscripts, most of which are either incomplete, not available for prolonged use or otherwise inaccessible due to location.

[68] The disease centred approach was taken as was taken by Rihab and Hirchberg, who focused their work surrounding MB specifically on the diseases referenced in the text.
[69] Complete compared to the other remaining manuscripts and in terms of what is currently discernable.
[70] The materia medica index which was instrumental for the work entailed in this thesis is entirely based on the page numbers and locations as they are displayed in the facsimile edition.

It was therefore necessary to seek out alternative avenues to access MB. This led to the eventual discovery of two digitised copies of MB that could be consulted for cross-referencing[71].

1.5.3 Selecting a Substance

After identifying the source text of the thesis and further textual witnesses for consulting, the next focus was to turn back to the MMI in order to choose which substance to concentrate on. This decision was guided by two central considerations. The first of these considerations was choosing a substance with a moderate amount of mentions in order to delimit the scope of the work. This consideration would ensure the selection of a substance with enough mentions to be able to form a robust analysis whilst also not too many mentions as to make the scale of the task too big. For the purposes of the specific aims of this thesis, being able to provide insights on substance with a lot of mentions would have led to a broader understanding of the ways in which that substance was used within the context of MB. In spite of this, researching a substance with too large a number of mentions would expand the scale of the work beyond the scope of this thesis. As for working on a substance with too few mentions, it would have meant that each mention could have been examined in a lot more depth but it would have been more difficult to draw general insights and to categorise and compare data from a limited sample of mentions during the analysis phase. Upon implementing the first consideration, the large pool of potential substances was reduced to around 20.

The second consideration which would help to further reduce the selection was that the substance should be widely used historically and in modern times and across several ancient medical traditions. On the one hand, this consideration was practical in that it would help to further reduce the remaining selection of substances to choose from. On the other hand, the second consideration would help to situate this research within a wider contextual milieu allowing it to build upon previous knowledge and thus expand the potential for further studies to build upon the results. It would also mean that the present study would be able to offer a unique contribution which is new knowledge and information about a culturally and historically relevant substance from a hitherto unexplored perspective. Among the substances that remained, honey stood out as the substance that best fit the second brief with a total of 118 mentions over both volumes of the printed facsimile of MB. As discussed in section 1.2.1, honey's cultural and medical significance has endured throughout recorded history and this makes it of relevance to many fields of study. Therefore, the practical applications of the results of the current thesis may extend beyond the

[71] The exact method of cross-referencing will be discussed further on in this section.

fields of Arabic language studies, manuscript studies and the study of medieval Arabic-language medical texts into other fields of relevance to the study of honey itself.

1.5.4 Definition of a Mention

At this stage it was important to define clearly what should count as a 'mention'. Using the MMI as the starting point meant that every explicit mention of the word honey (Arabic: عسل ʿasal) was recorded. This meant that the process of demarcating what counts as a mention of honey could be defined as: any instance in text in which the word honey appears explicitly[72]. Any compound substance which may include honey as a significant component but does not include the word honey as part of its name would thus not be counted as a 'mention' of honey. This delimitation was guided by the need to make the scope of the research manageable in terms of quantity. Furthermore, in the absence of a reference material indicating the components of each compound substance it would be impossible to decide which to include or exclude in the analysis. Composing such a reference material, if possible, would be of great use but ultimately outside the scope of the current thesis.

1.5.5 Process

The completion of the first preparatory stages including the selection of text, locating of source manuscripts and the selection of the substance necessitated the formulation of the primary aim: '*How is honey used in the treatment of illness and disease in MB?'*. The scope of my materials initially covered books 1-10 of MB as these are the books included in both volumes of the printed facsimile edition of MB. However, as a philosophical introduction to MB that includes no mention of honey, book 1 was further eliminated from the materials that I was working with. Given that this task would involve closely examining a significant amount of poorly legible handwritten text it was important to take any measures that could make the navigation of these handwritings more efficient. The first of these measures involved using the MMI through both volumes of the facsimile print to further specify the exact locations of each mention. This task included going to the page number as specified in the MMI, finding the specific mention of honey, highlighting it on photocopied version of the page and noting the exact line number. Doing this aided in the efficiency of moving between the mentions of honey because it eliminated the need to search through the dense handwritings for the location of each mention every time. Moreover, going through the copious amounts of handwritings demonstrated the scale of the task in a tangible sense beyond just identifying the total number of mentions. After noting the line numbers of all mentions across the two volumes of the facsimile print it became apparent that the sample size of mentions was still too

[72] Implicit mentions of honey through the use of pronouns or demonstratives were treated as contextually relevant to the explicit mention but not counted as mentions in their own right.

large and would be infeasible to work through within a reasonable time frame. The decision was made to proceed with honey as the choice of substance and to work solely on the mentions in volume one of the facsimile print of MB instead of both volumes. This meant cutting down the sample size of mentions from 118 to 33 and limiting my materials to books 2-5 of the text. Books 6-10 deal with the oral cavity and downwards to the excretory organs and would necessitate a separate study due to the sheer volume of work that their inclusion would entail.

Upon completing the previous task it was apparent that access to page and line numbers of each corresponding[73] mention of honey in the two digital facsimiles would also be necessary. This task proved to be time-consuming. This process entailed using the page and line numbers of honey mentions in the printed facsimile to approximate the general location of each corresponding mention in the digital facsimiles. Using the approximated whereabouts as a guide all that remained was to go through the handwritings to identify the page and line numbers for each mention in the digital facsimiles[74]. These details were noted and then compiled into a table for ease of reference[75].

The next stage of the process was to go through each individual mention on a systematic basis. This first step towards this entailed identifying the context of the mention. This step was important because determining where each specific mention begins and ends wasn't always straightforward. That notwithstanding, the general structure of most of the chapters in MB, as described in section 1.3.4, is similar and this facilitated determining the overall context of a mention.

In order to determine the wider context of the mention it was necessary to first identify which subsection it was included in. It is important here to again emphasise, as discussed in section 1.3 of this paper, that although these 'subheadings' appear as be highlighted as a structural element in both the OL and BL[76], this paper does not claim that these divisions are determined and/or emphasised by the text's writer. In books 2-5 of MB, all identified mentions of honey occur under the subheading 'prescription' (نسخة) or 'treatment' (علاج). If the prescription or treatment section was relatively short, I would work on understanding the specific mention within the context of the section in its entirety thus taking into account most, if not all, of the prescription section. If the prescription or treatment section was very long or the beginning and/or ending of the section wasn't easily determinable due to lack of discernible subheadings

[73] Corresponding to the first volume of the printed facsimile.
[74] The OL manuscript is missing the final four folios and due to this has only 22 out of the total 33 mentions as corresponds to the printed facsimile.
[75] See: Appendix A
[76] And to a lesser extent in the printed facsimile.

it was then necessary to make an approximation of portion text to focus. This approximation was based on other cues like contextual or grammatical signals that the previous sentence or paragraph was finished. Figure 6 shows an example of the scope of the context of one mention from the printed facsimile version of MB. The image[77] shows an example of a mention of honey that occurs as part of a prescription for an aloe infusion. The red dotted line indicates where the context of a mention begins and ends and the solid red line shows where the mention of honey occurs:

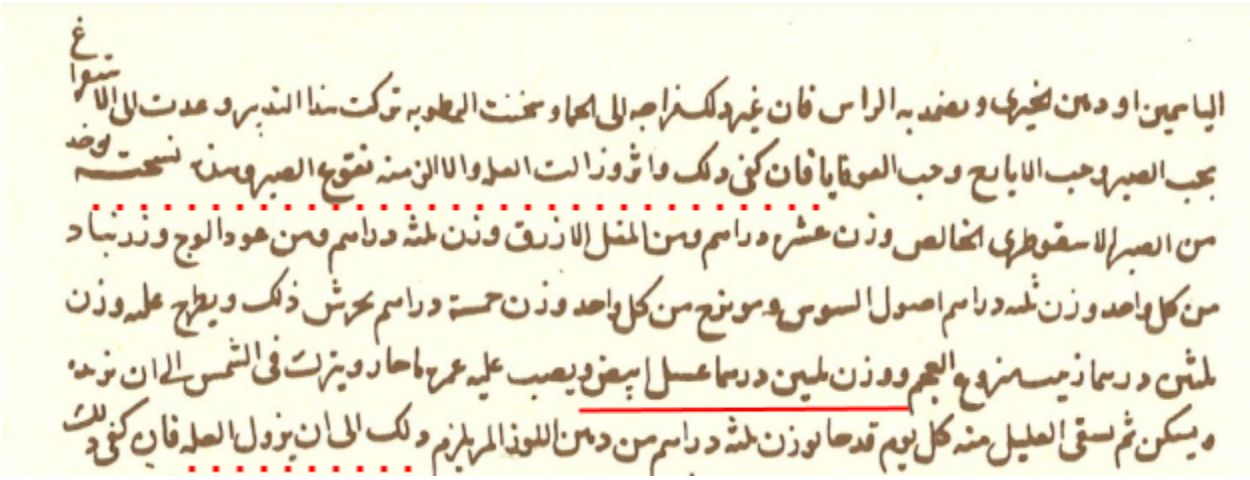

Figure 6: Determining context, section from facsimile print of MB

Once the surrounding context for the particular mention had been determined the next step was to decipher the meanings of the handwritings on the page. Due to the aforementioned poor readability and scribal errors combined with the still copious amounts of text that needed to be read this was a time-consuming and incredibly laborious process. Additionally, the terminology and grammatical anachronisms required the use of specialised glossaries and the close consultation of contemporary medical encyclopaedias and their editions[78].

Through cross-referencing between the manuscripts it was possible to decipher the relevant sections of text and to interpret them as accurately to the words on the page as possible. For each individual mention the process of cross-referencing might be repeated several times before arriving at the final reading.

[77] The image, which is scanned from the printed facsimile, also provides an insight into the type of small, clustered handwriting that occurs in this text which oftentimes proved challenging to read.

[78] The most useful of these sources have been Ibn Sina's Canon of Medicine and its translation and critical edition by Bakhtiar (1999), Bos' critical edition of *Ibn al-Jazzār's Provision for the Traveller* (2015) and the glossary in Meyerhof's 1931 article on the text Paradise of Wisdom.

Cross-referencing involved first consulting the facsimile print and putting forward a tentative first reading and then consulting the two digital manuscripts to check for either correspondence with the initial reading or interpretation for any deviations. In the case where there was any deviation between the texts, preference was given to the reading from the printed facsimile whenever the reading was the more plausible and contextually relevant. The purpose of this process of cross-referencing was to provide support for the reading of the more challenging examples of handwritings while still prioritising the printed facsimile as the primary reference material.

Next, the type of honey and the ways in which it was used would be described and noted down. When doing this, four factors began to emerge as significant factors in the way that honey was being described. The first of these factors was the type of honey used. All in all, there are six different types of honey mentioned in books in my materials covering books 2-5: honey, white honey, malabathrum honey, tamarisk honey and defoamed honey. The second factor was the quantity of honey. Some mentions of honey include no suggested quantity, some instruct to use 'a little bit' of honey, some recommended a desired quantity and one case instructs a very specific quantity. This became significant enough to be included in the descriptions of each mention because the variation in the descriptions of quantity of honey to be used emerged as an interesting factor worthy of more investigation. The third factor was the pharmaceutical form that honey was included in. Some examples of the pharmaceutical forms that were in my materials were: plaster[79], eye salve[80] and drink[81]. The fourth and final factor that was included in my descriptions of the mentions was the descriptions of the ways in which honey was prepared or used in the preparation of these various pharmaceutical forms. In most of the mentions the author gives some instructions for the way that honey should be prepared for its inclusion in a treatment. Some examples of means of preparation include grinding, sieving and kneading honey, cooking honey with other ingredients and simply adding honey to prepared treatments.

In the next step, the approach to treatment that honey was included in was noted. In section 1.3.1, some of the structural devices that are apparent in BL and OL manuscripts were discussed, for example the emphasised subheadings. Along with helping to identify the delimitations of certain sections in any given chapter, these subheadings also became a useful tool to help understand the different ways that honey is utilised within the text with regards to approach to treatment. As discussed previously, two of these emphasised subheadings in the text are 'prescription' and 'treatment' and these two subheadings formed and so whenever a mention of honey was included under one of these subheadings this was noted down.

[79] ضماد
[80] شياف
[81] شراب

A prescription is defined as a recipe for a compound remedy which includes *materia medica,* their quantities and method of preparation. Prescriptions are part of the pharmaceutical approach to treatment. On the other hand, practical treatments (*'ilajat*) are forms of treatment that may include pharmaceutical elements but are not specifically designated as prescriptions and do not share the characteristics of prescriptions. Furthermore, in practical treatments the measurements or quantities of all substances are not specified unlike in prescriptions

Additionally, there were some mentions of honey that occurred under the subheadings 'prescription' or 'treatment' but were further specified by the writer to be part of a 'regimen' and all mentions of honey that were specifically designated as being part of a regimen were noted. Even though 'regimen' was not highlighted as a subsection in the same way that 'prescription' and 'treatment' are, it was important to define mentions of honey that occur as part of regimens as differentiated from those occurring as part of prescriptions or practical treatments due to the fact that the physicians of antiquity considered regimen as a specific approach to treatment[82].Regimen is defined as the dietary and/or lifestyle recommendations that a patient should implement into their overall treatment plan in response to environmental factors (like climate or season) or internal factors (such as temperament). It is differentiated from the other two categories in that the text always mentions the word regimen[83] to specify when it is a regimen being discussed.

The boundaries between prescriptions and practical treatments were not clear in every case, for example clear subheading to indicate the beginning of a new prescription or treatment. With this said, the majority of cases the occurrence of a prescription, treatment or regimen is clearly labelled or otherwise specified by the author. In the cases where it was not made explicitly clear by the author, I have categorised the mention according to shared characteristics. The shared characteristics of prescriptions in MB are: list of *materia medica*, quantities of ingredients included in the prescription, instructions for preparation and instructions for use. The shared characteristics of practical treatments are: short list of substances to be used in the treatment without measured quantities, instructions for application or use of the treatment and/or instructions for preparation of the treatment. The shared characteristics of regimens are: recommendations of a dietary or lifestyle nature, time frame for the regimen and instructions for preparation or administration.

[82] For more on the place of regimen in ancient medical theory see: Berryman, "Motion and rest: Galen on exercise and health", 2012
[83] تدبير

The final step was then provided descriptions for each individual mention that was included in my materials. These descriptions are compiled in section 2, *Results*.

1.6 Limitations

This section expands upon some of the limitations encountered in the process of conducting this study.

While the starting point for further research of MB naturally begins with concerted effort to examine the available manuscripts that we have available to us, it is important to highlight that in the absence of a full critical edition of MB the researcher should approach the available manuscripts with a level of careful consideration. Ambjörn highlights this stating "the facsimile-print must be consulted with caution since it might contain later interpolations."[84,85] and Sezgin makes it clear that that the facsimile edition is replete with scribal errors[86]. This factor should be acknowledged and borne in mind when approaching such manuscripts. Consulting more than one textual witness is one method that has been employed to mitigate such factors; however it stands to reason that the manuscripts consulted for this thesis might be copies of one and other, thus compounding the effects of scribal errors and interpolations.

In terms of the impact of some of the methodological decisions, one of the most important was the limiting of what counts as a mention of honey to strict mentions using the word honey[87]. This decision was guided by the need to make the scope of the research manageable in terms of quantity. Furthermore, the aim of this study was to explore the uses of honey in the text and making the definition of honey too wide would have hindered my ability to conduct a clear and concise study. One of the limitations of this choice is that there may have been some mentions of honey that appear in the text but for some reason have not been recorded in the index. The poor legibility of the handwritings combined with the fact that there are some positions where damage to the text or unclear sections may have led to a missed mention. It is also the case that additional mentions of honey in MB may have been left out of the MMI on account of being misconstrued for another contextually appropriate interpretation. Although it was possible to locate every single mention listed in the MMI in both digital manuscripts, without going through the content of the BL and OL manuscripts in more extensive detail it is outside the scope of the current thesis to determine whether or not there are additional mentions of honey besides those identified in the MMI.

[84] Ambjörn 2011:104
[85] While this point is noteworthy to highlight, to produce a complete stemma of the relationship between the manuscripts would go beyond the scope of this thesis.
[86] Sezgin, 1990:VII
[87] عسل ʿasal, العسل al-ʿasal

Another impact of the decision to count only strict mentions of honey[88] is that there are commonly used compound substances that are primarily composed of honey or otherwise honey-based that are omitted from the analysis. One example of this is sakanjubīn[89] which is a preparation of honey mixed with vinegar. The decision to focus only on strict mentions of honey has meant the exclusion of compound substances which are possibly used in similar ways to honey and which can contribute to the understanding of the uses of honey in MB.

In section 1.5.5, I discussed how the context surrounding a mention of honey would be determined. In some cases however, there were no contextual indications that facilitated this determination without having to work through entire books of the text which would have been an extensive undertaking. Due to the fact that honey is not always explicitly mentioned in the text and may be referred to indirectly, this meant having to estimate where the context for a mention began and ended for some cases. In order to resolve this, every reasonable effort was taken to ensure that indirect mentions of honey with contextual relevance have been taken into account.

[88] عسل ʿasal, العسل al-ʿasal

[89] Appears in MB as سكنجبين ; otherwise known as oxymel.

2 Results

This chapter provides the results of the study, compiled in a table which sets forth the descriptive details pertinent to each individual mention. The first column provides the reference number and chapter title of each mention which works as follows:

> **I:2:1** corresponds to volume I, book 2, chapter one.

Additionally, the page number and line number of each mention corresponding to Sezgin's printed facsimile of MB[90] is provided. In the second column there is a brief description of each mention and its context. The third column lists the type of honey named in each mention and column four lists the quantity of honey that is specified for use in each individual case. Columns five and six detail the pharmaceutical form that honey is to be included as a part of and the means of preparation of honey respectively. These two designations are to be understood in the following way:

- Pharmaceutical form[91] may be understood as referring to the form in which drug or medicine is presented and/or administered.

- Means of preparation may be understood as referring to the specific instructions that are given about what should be done to the honey as part of its preparation for inclusion in a pharmaceutical form. These instructions may give direct details of what is to be done with the honey (i.e. add honey to the decoction) or indirect details of how honey interacts with other ingredients (i.e. add the ingredients to honey).

[90] A table providing page and line numbers corresponding to the BL manuscript and the OL manuscript may be found in Appendix A.
[91] For anyone interested in the exact terminology of pharmaceutical designations as relates to forms and means of administration see: Fellmann:1986.

2.1 Table of Results

Approach to Treatment Key: **Prescription** **Regimen** **Practical Treatment**

Ref #	Description of Mention	Type of Honey	Quantity	Means of Administration	Means of Preparation
Book 2: Illnesses of the scalp and skin of the face					
I:2:1 (p.57, line 15) **Alopecia**	Honey is mentioned in the prescription section for the treatment of symptoms of alopecia that have arisen due to imbalance of the humors. Honey is mentioned in the instruction for preparation for a pill referred to as 'roman dodder pill'.	Honey	No quantity suggested	Pill	Ingredients should be ground, sieved and then kneaded into honey.
I:2:18 (p.75, line 7) **Injuries Which Occur in the Skin of the Head**	Honey is mentioned in a section detailing the prescription for an ointment which is to be applied to a head injury that has become unclean by some unspecified means. Honey is mentioned after the main recipe for the ointment in the instructions for its preparation.	White honey	A little bit	Ointment	Honey is added to ointment concoction and then pounded together with the other ingredients until well-mixed.
I:2:19 (p.78, line 5) **Headaches Which Occur in the Skin of the Head or in the Subcutaneous Membrane**	Honey is mentioned as part of a treatment for a headache in a prescription for an aloe infusion. Honey is mentioned as part of the main list of ingredients for the infusion.	White honey	30 dirhams	Infusion	Specified quantity of honey is added to ingredients of aloe infusion.

I:2:28 (p.86, line 23) **Improvement of Swarthy Complexion and Corruption of the Complexion**	Honey is mentioned as part of a practical treatment for a compound remedy of a plaster. The mention occurs after the main list of ingredients for the plaster in the instructions for its preparation.	Honey	A little bit	Plaster	Plaster ingredients are mixed into milk and honey. Honey may be used interchangeably with psyllium mucilage and yoghurt.
Book 3: Illnesses of The Brain					
I:3:5 (p.99, line 2) **Cold Headache**	Honey is mentioned as part of a prescription for decoction used to induce evacuation. The mention occurs after the main list of ingredients for the decoction in the instructions for its preparation.	Honey	No quantity suggested	Decoction	Ingredients are ground and then kneaded into honey.
I:3:8 (p.102, line 21) **Cold Migraines**	Honey is mentioned as an ingredient in a drink that should be administered as post-treatment for a patient who has undergone a venesection. The mention occurs in the description of regimen recommendations for the patient.	Honey	No quantity suggested	Beverage	Honey is cooked with radish and salt and should be drunk alongside oxymel.
I:3:19 [1] (p.114, line 11) **Cold**	Honey is mentioned as part of a regimen for a patient suffering from a cold. It is mentioned as "malabathrum honey drink" which is recommended as an alternative beverage to water. The mention occurs in the regimen recommendations.	Malabathrum[92] honey	No quantity suggested (not applicable)	Beverage	Malabthrum honey drink should be drunk instead of water.

[92] Lev & Amar 2008, p. 444

I:3:19 [2] (p.114, line 17) **Cold**	Honey is mentioned as part of a practical treatment for clearing throat blockage in a patient suffering from a cold. It is mentioned, along with several other substances, as part of the instructions for how to prepare the bottle that is to be used in the smoke treatment.	Tamarisk honey	No quantity suggested.	Smoke inhalation via bottle	Tamarisk honey should be burned and inhaled along with several other dry ingredients.
I:3:20 (p.117, line 9) **Vertigo**	Honey is mentioned as one of the substances used to create a gargling solution. It is mentioned as part of a practical treatment for vertigo as post-treatment after an enema.	Honey	No quantity suggested	Gargle	Dry ingredients should be warmed in honey and gargled.
I:3:21 [1] (p.112, line 13) **Dizziness**	Honey is mentioned as a pre-treatment regimen for a patient who is about to undergo an enema for treatment of dizziness. It is mentioned as a pre-prepared malabathrum honey drink, the recipe of which is not specified.	Malabathrum honey	No quantity suggested (not applicable)	Beverage	Malabathrum honey drink should be drunk.
I:3:21 [2] (p.121, line 15) **Dizziness**	Honey is mentioned as part of a post-treatment regimen for a patient who will be treated with an enema.	Honey	No quantity suggested	Unclear	Honey should be used to “strengthen and purify the stomach”. No further information provided.
I:3:23 (p.125, line 21) **Lethargy**	Honey is mentioned in a prescription for the treatment of lethargy. It is mentioned after the main list of ingredients in the instructions for the prescription’s preparation.	Honey	No quantity suggested	Decoction	Ingredients should be ground, sieved and kneaded into honey and then drunk.

I:3:25 (p.129, line 2) **Catatonia**	Honey is mentioned as part of a prescription for an enema. It is mentioned after the main list of ingredients in the instructions for preparation along with several other liquid ingredients to be added to the prepared enema solution.	Honey	Desired quantity	Enema	Dry ingredients and a number of liquid ingredients including honey should be incorporated using a mortar. Honey may be used interchangeably with brown sugar.
I:3:27 [1] (p.131, line 24) **Epilepsy**	Honey is mentioned as part of a prescription for a decoction used to treat symptoms of epilepsy. It is mentioned after the main list of ingredients in the instructions for preparation.	Honey	No quantity suggested	Decoction	Bitter ingredients should be ground, sieved and kneaded into honey. The resulting electuary should be added to a prepared decoction and drunk lukewarm.
I:3:27 [2] (p.132, line 13) **Epilepsy**	Honey is mentioned as part of a practical treatment for epilepsy. It is mentioned in the treatment section as part of the instructions to induce expulsion.	Honey	No quantity suggested	Consumed	Honey and salt are added to boiled radishes and consumed.
I:3:27 [3] (p.134, line 20) **Epilepsy**	Honey is mentioned as part of a prescription for syrup suggested by a student of an unspecified Bukhtishu[93] to resolve epilepsy. The mention comes at the end of the chapter as ancillary information.	Honey	No quantity suggested.	Syrup	Honey should be added into a pre-prepared decoction in order to make it into a syrup. Honey may be used interchangeably with sugar.
I:3:31 [1] (p.142, line 5) **Melancholia**	Honey is mentioned as part of a prescription for the treatment for melancholia.	Honey	No quantity suggested	Electuary	Ingredients should be kneaded into honey and then consumed.

[93] Bukhtishu (or Bakhtīshūʿ) is a family name for family of physicians who were prominent between the 7th to 9th centuries. Although it is not specified by al-Tabari which exact person is being referred to here, more can be found about this family in the article entitled "Bakhtīshūʿ" found in the Encyclopaedia of Islam <http://dx.doi.org/10.1163/2214-871X_ei1_SIM_1236>

I:3:31 [2] (p.147, line 20) **Melancholia**	Honey is mentioned in a prescription section detailing the recipe for epithymum electuary. It is mentioned after the main list of ingredients in the instructions for the prescription's preparation.	Honey	No quantity suggested	Electuary	Ingredients should be kneaded into honey.
I:3:38 (p.162, line 15) **Stroke**	Honey is mentioned as part of a regimen for a stroke patient. It is mentioned as part of the dietary recommendations that the patient should undergo during a phase of treatment.	Honey	No quantity suggested	Beverage	Honey should be boiled with dill and salt to make a drink.
I:3:39 (p.165, line 2) **Hemiplegia**	Honey is mentioned as part of a regimen for a patient suffering from hemiplegia. The mention occurs as part of a five day regimen recommendation that the patient should undergo concurrently with a treatment.	Malabathrum honey	No quantity suggested	Beverage	Malabthrum honey drink should be drunk instead of water.
I:3:40 [1] (p.168, line 20) **Facial Paralysis**	Honey is mentioned as part of a regimen for the treatment of facial paralysis. Malabathrum honey drink along with avoiding exposure to cold air and water is recommended to a patient with a cold disposition.	Malabathrum honey	No quantity suggested (not applicable)	Beverage	Malabathrum honey drink should be drunk instead of water.
I:3:40 [2] (p.168, line 21) **Facial Paralysis**	Honey is mentioned as part of a regimen for the treatment of facial paralysis for a patient living in a cold climate.	Acacia honey	No quantity suggested (not applicable)	Beverage	Acacia honey drink should be drunk instead of water.
Book 4: Illnesses of the eyes					
I:4:25	Honey is mentioned as part of a	Honey	A little bit	Eye drop	Honey that is mixed into a

(p.209, line 19) **Eye Ulcer**	practical treatment for a swelling eye ulcer that is not responding well to other treatments.				fenugreek decoction should be dripped into the ulcerated eye.
I:4:26 [1] (p.210, line 17) **Leucoma**	Honey is mentioned as part of a prescription for the treatment of leucoma. It is mentioned after the main list of ingredients as part of the instructions for preparing an eye salve.	White honey	No quantity suggested	Eye salve	White honey is mixed with ingredients to form a paste that should be applied to the eye.
I:4:26 [2] (p.210, line 21) **Leucoma**	Honey is mentioned as a reference to a treatise written by al-Sāhir[94]. Honey is part of the treatment recommended by al-Sāhir as a treatment for leucoma.	Honey	No quantity suggested	Eye salve	Honey that has been warmed is mixed with other pulverised ingredients.
I:4:39 (p.225, line 15) **Types of Water Descent**	Honey is mentioned in a prescription for an eye salve to treat a type of eye watering. It is mentioned after the main list of ingredients in the instructions for preparation.	De-foamed honey	No quantity suggested	Eye salve	Crushed and ground non-food ingredients are kneaded into de-foamed honey to form an eye salve.
Book 5: Illnesses of the nose and ears					
I:5:8 (p.253, line 26) **Necrosis of the Nose**	Honey is mentioned in a chapter detailing a practical treatment for rotting that has set in in the nasal bones.	De-foamed honey	No quantity suggested	Nasal drops	Honey is mixed with an unclear substance inserted into the nose.
I:5:13 (p.257, line 7) **Ear Ailments**	Honey is mentioned in the chapter detailing the different kinds of ear ailments. It is mentioned as a practical treatment that should be undergone after a prescription.	De-foamed honey	No quantity suggested	Unclear	Honey is mixed with other ingredients.

[94] For more on al-Sāhir see: See GAS III: 269

I:5:16 (p.261, line 20) **Cholesteatoma**	Honey is mentioned as part of a prescription for the treatment of heaviness in the ear caused by cholesteatoma.	De-foamed honey	No quantity suggested	Inserted into the ear on woven wool.	Honey is mixed with other ingredients and put in the ear using a vessel.
I:5:20 (p.263, line 23) **Ear Ailments**	Honey is mentioned as a part of a prescription to treat an unclear ear ailment. Honey and vinegar may be used interchangeably in this prescription depending on the patient's temperament.	Honey	No quantity suggested	Inserted into the ear on a piece of cotton.	Ground ingredients are diluted using honey and put in the ear using a vessel.
I:5:23 (p.264, line 24) **Tinnitus**	Honey is mentioned as part of a practical treatment for tinnitus for a patient with a cold temperament.	Honey	No quantity suggested	Inserted into the ear on a piece of wool.	Ground ingredients are added to honey and put in the ear using a vessel.
I:5:27 [1] (p.267, line 16) **Deafness**	Honey is mentioned as part of a practical treatment for deafness. It is mentioned along with three other ingredients that should be kneaded in honey and used as an ear drop.	Honey	No quantity suggested	Ear drop	Honey is mixed with black figs and red borax to form a paste that is dripped into the ear.
I:5:27 [2] (p.267, line 19) **Deafness**	Honey is mentioned as a secondary practical treatment for deafness should hearing loss persist after other treatments.	Honey	No quantity suggested	Ear drop	Crushed black hellebore is added to honey and dripped into the ear.

3 Account of Results

In the following chapter, an account of the results of this study as presented in chapter 2 will be provided. In section 3.1, we will give an account of all of the diseases that honey is used in the treatment of within chapters 2-5 of MB. Section 3.2 describes the types of honey references in books 2-5 of MB in more detail. The pharmaceutical forms that honey is used as a part of will be discussed with reference to the means of preparation in section 3.3. In section 3.4 the approach to treatment that honey is used in such as prescription, regimen or practical treatment will be accounted for. Finally, in section 3.5, we will account for what books 2-5 say about the quantity of honey used.

3.1 Diseases

This study set out to explore what books 2-5 have to say with regards to the uses of honey through the lens of a few different factors. One of these factors is disease. In books 2-5 of MB, honey is used in the treatment of 20 different diseases or conditions. In this section, an account of the way that honey is used in connection with these diseases will be provided.

Book 2: Illnesses of the Scalp and Skin of the Face

In book 2 which is titled *Illnesses of the Scalp and Skin of the Face* honey is mentioned a total of 4 times in the treatment of four diseases. The diseases that honey is used in the treatment of in book 2 are: alopecia, head injury, headache and corrupted complexion.

- **Alopecia**[95] (I:2:1):. Honey is mentioned once in the first chapter of book two of MB which is entitled Alopecia. It is mentioned as an ingredient used in a prescription for a pill which is to be used as part of the course of treatment for the condition.

- **Injuries which occur in the skin of the head (**I:2:18): This chapter is a general chapter that covers various different types of non-specific injuries, traumas or wounds that may occur on the scalp or skin of the head. In this mention, white honey[96] is mentioned in a prescription for an ointment called *honey ointment*[97] to topically treat a head injury that has become unclean.

[95] داء الثعلب
[96] العسل الأبيض
[97] مرهم العسل

- **Headaches that occur in the skin of the head of in the subcutaneous membrane known as *al-bayḍa*[98]** (1:2:19): Honey is mentioned as one of the main ingredients in a prescription for an *aloe infusion* that is to be used in the treatment of a specific type of headache that occurs in the subcutaneous membrane. The type of honey that is in the treatment of this condition is white honey.

- **Corruption of the complexion** (I:2:28)**:** This condition involves the patient taking on a swarthy complexion and according to al-Ṭabarī it primarily afflicts the aged and infirm. Honey is one of two liquid ingredients[99] that are used in the preparation of a plaster[100] or dressing that is to be applied directly onto the skin of the face.

Book 3: Illnesses of the Brain

Honey is mentioned 18 times in book three of MB, entitled *Illnesses of the Brain* is used in the treatment of 12 different diseases. The diseases that honey is used in the treatment of in book three are: *cold headache with substance, cold migraine, cold, vertigo, dizziness, lethargy, catatonia, epilepsy, melancholia, stroke, hemiplegia and facial paralysis.*

- **Cold headache "with substance"**[101][102] (1:3:5)**:** In books three of MB, numerous chapters are devoted to discussing the treatments for headaches in several different manifestations. Two of the main types of headaches are cold headaches and hot headache and both of these types may occur with or without substance. This particular type of headache is defined as cold and occurring with moist substance. Honey is used in a prescription for a decoction to induce evacuation.

- **Cold migraine**[103] (I:3:8)**:** Like headaches, migraines are differentiated by whether they are hot or cold. In this section on cold migraines, honey is mentioned once as an ingredient in a drink that should be taken by a patient after a venesection treatment.

[98] الصداع التي تحدث في جلد الرأس وفي الغشاء التي تحت الجلد المعروفة بالبيضة
[99] With the other liquid ingredient being milk.
[100] الضماد
[101] الصداع البارد مع المادة
[102] In book 3, al-Ṭabarī makes a distinction between headaches and migraines with substance and without substance but the meaning of this distinction is not made immediately apparent.
[103] الشقيقة الباردة

- **Cold**[104] (I:3:19)**:** Honey is mentioned twice in the chapter that focuses on the treatment of the common cold or coryza. In the first mention, malabathrum honey drink[105] is recommended to be drunk instead of water for a patient suffering a cold. In the second mention, tamarisk honey[106] is used as part of a smoke inhalation treatment to clear a blockage in the throat caused by symptoms of the cold.

- **Vertigo**[107] (I:3:20): Chapter 20 in book three details the treatment for vertigo which is characterised by the sensation that your surroundings are spinning or moving. In this case, honey is used alongside some other substances to create a gargle that is to be used after an enema treatment.

- **Dizziness**[108] (I:3:21): In chapter 21 of book 3, honey is mentioned twice and used in the treatment of a type of dizziness which stems from the gathering of cold humours. In the first mention, malabathrum honey drink is recommended to be taken as part of a regimen alongside an enema treatment. The second mention of honey in this chapter is as part of a stomach purifying treatment that should be commenced in the case that the aforementioned enema treatment is deemed successful.

- **Lethargy**[109] (I:3:23): Lethargy is described primarily by al-Ṭabarī as being characterised by excessive sleep, dullness and confusion upon waking, losing track of time and decreased movement. Honey is mentioned as part of a prescription that should be used to treat symptoms of lethargy.

- **Catatonia**[110,111] (I:3:25): Honey is mentioned in chapter 25 of book three which is a chapter dealing with the disorder catatonia. Honey is mentioned as one of the ingredients that is used in the prescription recipe for an enema which is part of the treatment for symptoms of catatonia.

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[104] الزكام
[105] شراب العسل السادج
[106] عسل الطرفاء
[107] الدوار
[108] السدر
[109] السبات
[110] الجمود
[111] Fore more about catatonia and its symptoms see:
https://www.rcpsych.ac.uk/mental-health/mental-illnesses-and-mental-health-problems/catatonia

- **Epilepsy**[112] (I:3:27): Honey is mentioned three separate times in the chapter that addresses the treatments of epilepsy. The first mention occurs as part of a recipe for a decoction that is used to treat the symptoms of epilepsy. The second mention of honey occurs as part of a practical treatment recommendation whereby honey and salt are consumed with boiled radishes. In the third and final mention of honey occurs later on in the chapter and occurs as part of a recipe of a prescription suggested by a student of 'Bukhtishu'.

- **Melancholia**[113] (I:3:31): Honey is mentioned twice in the chapter that deals with the disorder called Melancholia[114]. In the first mention, honey is mentioned as part of a prescription of 'toxic medicaments' that should be taken with honey. As for the second mention of honey in this chapter, it is part of a prescription for an epithymum electuary.

- **Stroke**[115] (I:3:38): In chapter 38 of book 3 entitled Stroke, honey is mentioned once. It is mentioned as part of the dietary regimen for a particular phase of treatment for a stroke patient.

- **Hemiplegia**[116] (I:3:39): The condition hemiplegia refers to the paralysis of the one side of the body. In this chapter, malabathrum honey is used in the treatment of hemiplegia as part of a regimen that is to be undertaken concurrently with other treatment recommendations. In this regimen, the patient is to take malabathrum honey drink instead of water.

- **Facial Paralysis**[117] (I:3:40): Honey is mentioned twice in the section dealing with facial paralysis. The first mention of honey is as part of a regimen for the treatment of facial paralysis whereby taking malabathrum honey drink and avoidance of cold exposure is recommended. In the second mention of honey, acacia honey drink is recommended as treatment for a facial paralysis patient who is living in a cold climate.

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[112] الصرع
[113] المالنخوليا
[114] At (I:3:31) al-Ṭabarī defines melancholia as the corruption of the actions of the mind with melancholy (or black bile) that is abnormal in quality and quantity.
[115] السكتة
[116] الفالج
[117] اللقوة

Book 4: Illnesses of the Eyes

Honey is mentioned four times in book 4[118] of MB, entitled *Illnesses of the Eyes* and is used in the treatment of 3 different diseases. The diseases that honey is used in the treatment of in book four are: *eye ulcer, leucoma and eye watering.*

- **Eye Ulcer[119]** (I:4:25): Honey is mentioned once in this chapter dealing with eye ulcers and is part of an eye-drop treatment for when an eye ulcer is not responding to other forms of treatment.

- **Leucoma**[120] (I:4:26): This condition refers to the whitening of the cornea. Honey is mentioned twice in this chapter dealing with the treatment of leucoma. The first mention of honey is as white honey which is part of a prescription for an eye salve. The second mention of honey is with reference to a treatise by al-Sāhir[121], whereby a treatment recommended by al-Sāhir for the treatment of leucoma is recounted.

- **Eye-watering** (I:4:39): This chapter deals with the different types of eye watering and their causes and treatments. De-foamed honey is mentioned as part of a prescription for an eye salve to treat a specific type of eye watering.

Book 5: Illnesses of the Nose and Ears

Honey is mentioned seven times in book five of MB, entitled *Illnesses of the Nose and Ears* and is used in the treatment of five different diseases. The diseases that honey is used in the treatment of in book five are: *necrosis of the nose, unclear/unspecified ear ailment, ear swelling, tinnitus and deafness.*

- **Necrosis of the Nose[122]** (I:5:8): This chapter deals with a condition called necrosis of the nasal bone. Necrosis involves the death of the body's tissues. In MB, de-foamed honey is used in the treatment of the necrosis of the nasal bone as a part of a nasal drop that is applied directly to the site of necrosis.

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[118] Qalaji and al-Wafai's 1998 critical edition of chapter four of MB is an excellent resource for those who wish to know more about al-Ṭabarī's approach to treating illnesses of the eyes.
[119] القرحة
[120] البياض
[121] For more on al-Sāhir see: See GAS III: 269
[122] التنخر

- **Ear Ailment**[123] (I:5:13, I:5:20): Chapter twelve of book five provides a more general look at various ear ailments and is titled *Mentioning the Diseases of the Ear*. De-foamed honey is used once in this chapter to deal with an unnamed or otherwise unclear ailment of the ear as part of a treatment that is to be undergone after a prescription. Chapter 20 of book 5 is another general chapter titled treatments of the ear and covers different kinds of ear conditions. To treat this unspecified ear ailment, honey is used in the treatment of in this case is not specified or clearly mentioned.

- **Cholesteatoma**[124,125] (I:5:16): Cholesteatoma refers to the "abnormal collection of skin cells deep inside your ear" and al-Ṭabarī describes it as swelling that occurs either deep in the ear or on the cartilage of the ear. De-foamed honey is used in the treatment of the heaviness that is associated with this swelling.

- **Tinnitus**[126] (I:5:23): This chapter is focused on the condition called tinnitus or ear-ringing. Honey is mentioned once as a practical treatment for this condition whereby it is inserted with some other ground ingredients into the ear on a piece of wool

- **Deafness**[127] (I:5:27): Honey is used twice in chapter 27 of book 5 which deals with the treatment of deafness. In the first mention, honey is mentioned as one of four ingredients that should be administered to the ear as an ear drop. In the second mention, honey is mentioned again as one of the ingredients for another ear drop, separate to the previously mentioned one.

As we can see, honey is used in the treatment of a wide spectrum of diseases in books 2-5 of MB.

3.2 Type of Honey

There are six different types of honey that are mentioned in books 2-5 of MB. These are honey, white honey, malabathrum honey, tamarisk honey, acacia honey and de-foamed honey. This section provides an account of these types of honey.

[123] In both of these cases, the ear ailment that honey is being used in the treatment of is not clear on account of the author not specifying in either case the name of the disease being treated.
[124] ورم تحدث في الأذن
[125] For more on cholesteatoma see: https://www.nhs.uk/conditions/cholesteatoma/
[126] الطنين
[127] الطرش

- **Honey**: Plain honey is the most commonly occurring type of honey that is mentioned in books 2-5 of MB and accounts for 20 of the 33 total mentions of honey.

  Honey features in each of the books 2-5 and is used in the treatment of the following diseases: alopecia (I:2:1), corruption of the complexion (I:2:28), cold headache (I:3:5), cold migraine (I:3:8), vertigo (I:3:20), dizziness (I:3:21), lethargy (I:3:23), catatonia (I:3:25), epilepsy (I:3:27), melancholia (I:3:31), stroke (I:3:38), eye ulcer (I:4:25), leucoma (I:4:26), ear ailments (I:5:20), tinnitus (I:5:25) and deafness (I:5:27).

  In books 2-5 of MB, honey is used in 13 different means pharmaceutical forms which are: pill (I:2:1), plaster (I:2:28), decoction (I:3:5, I:3:23, I:3:27), medicinal potion (I:3:19, I:3:38) gargle (I:3:20), enema (I:3:25), consumed (I:3:27 [2]) , syrup (I:3:27 [3]), electuary (I:3:31 [1]), eye-drop (I:4:25), eye-paste (I:4:26 [2]), inserted into ear on a vehicle (I:5:20, I:5:23) and ear drop (I:5:27 [1], I:5:27 [2]).

- **White honey**[128]: Mentions of white honey account for 3 of the 33 total mentions of honey.

  White honey features in books 2 and 4 only. In books 2 and 4 of MB, honey is used in the treatment of the following diseases: injury which occurs in the skin of the head (I:2:18), headache (I:2:19) and leucoma (I:4:26 [1]).

  White honey is used in 3 different pharmaceutical forms which are: ointment (I:2:18), infusion (I:2:19) and eye salve (I:4:26 [1]).

- **Malabathrum honey**[129,130]: Mentions of malabathrum honey account for 4 of the 33 mentions of honey. Malabathrum honey features in book 3 only.

  In book 3 of MB malabathrum honey is used in the treatment of the following diseases: cold (I:3:19), dizziness (I:3:21[1]) , hemiplegia (I:3:39) and facial paralysis (I:3:40 [1]).

[128] العسل الابيض
[129] العسل الساذج
[130] For more on malabathrum see Kokozsco & Rzeźnicka,"Malabathron in Ancient and Early Byzantine Medicine and Cuisine", *Journal of History of Medicine* 2018 and Lev & Amar 2008: 444.

Malabathrum honey is used in one pharmaceutical form: medicinal potion.

- **Tamarisk honey**[131,132]: Mentions of tamarisk honey account for 1 of the 33 mentions of honey. Tamarisk honey features in book 3 only.

  In book 3 of MB tamarisk honey is used in the treatment of the following disease: cold (I:3:19 [2]).

  Tamarisk honey is administered by one means which is: smoke inhalation via bottle (I:3:19 [2]).

- **Acacia honey**[133,134]: Mentions of acacia honey account for 1 of the 33 mentions of honey. Acacia honey features in book 3 only.

  In book 3 of MB acacia honey is used in the treatment of the following disease: facial paralysis (I:3:40 [2]).

  Acacia honey is used in the following pharmaceutical: medicinal potion (I:3:40 [2]).

- **De-foamed honey**[135]: Mentions of de-foamed honey account for 4 of the 33 mentions of honey. De-foamed honey features in books 4 and 5.

  In books 4-5 of MB, de-foamed honey is used in the treatment of the following diseases: eye watering (I:4:39), necrosis of the nose (I:5:8), ear ailment (I:5:13) and cholesteatoma (I:5:16).

  De-foamed honey is used in the following pharmaceutical form: eye salve (I:4:39), nasal drops (I:5:8), inserted into the ear on a vehicle. (I:5:16).

In summary, we have observed that in books 2-5 of MB, several different types of honey are used with plain honey being the most widely used type of honey. We have also seen that certain types of honey are

[131] عسل الطرفا or عسل الطرفاء
[132] For more on tamarisk see Lev & Amar 2008, p. 496.
[133] عسل الأقاقيا
[134] For more on acacia see Lev & Amar 2008, p.180.
[135] العسل المنزوع الرغوة

used exclusively in certain books of MB. Further studies focusing specifically on the different types of honey may reveal the way that different types of honey are used in the treatment of certain areas of the body and why they are used in this way.

3.3 Pharmaceutical Form

This study found that in books 2-5 of MB there is a total of 17 explicitly elucidated[136] pharmaceutical forms by which honey may used as a part of[137]. Each unique pharmaceutical form throughout books 2-5 of MB is book-specific meaning that it only occurs in the book in which it is mentioned, for example pill as a pharmaceutical form only occurs in book two of MB[138]. Given that the structure of MB is divided into books based on region of the body, it follows that each book may follow a different approach to treatment. Honey is used across a diverse range of applications that differ fundamentally based on which part of the body is being treated and it has properties that makes it applicable or even preferable for different forms, from pills to electuaries and from medicinal potions to eye-pastes.

In examining the instructions for preparing the pharmaceutical forms, it emerged that when there was no reference to what specific quantity of honey should be used that honey was often used to homogenise or make a paste of other ingredients. That is to say that honey was used as a 'vehicle' to suspend or mix other ingredients together. This led to the assumption that when a specific measured quantity of honey was mentioned that this might indicate that honey is 'active substance' or an ingredient used for a medicinal purpose as opposed to a practical purpose such as thickening, sweeting or binding.

The pharmaceutical forms by which honey is administered in books 2-5 of MB are as follows:

1) **Pill**[139,140] (1:2:1): Pill as a pharmaceutical form occurs once in book 2 of MB in a roman dodder pill. Several ingredients are ground and sieved and then kneaded into honey and the resulting mixture is formed into a pill.

   In this case honey is mentioned after the main list of *materia medica*, without reference to quantity and is used as a vehicle to combine ingredients.

[136] Explicit elucidation meaning that the author gave the means a specific name e.g. مَرْهَم : *marham*/ointment or the means is explicitly elucidated through instruction e.g. drop into eye, which is then listed as eye-drops.
[137] Additionally, there are two instances where the pharmaceutical form is not clear or not otherwise derivable.
[138] This may be due to the fact that pharmaceutical form depends on several factors such as the illness that is being dealt with or the region of the body that is being treated.
[139] حب - حبوب
[140] For more on pills see Fellmann 1986:202

2) **Ointment**[141,142] (1:2:18): Ointment as a pharmaceutical form occurs once within books 2 of MB. A little bit of white honey is added to a concoction of other ingredients and then they are pounded together until well-mixed and the result is 'honey ointment'[143].

   In this case honey is mentioned after the main list of *materia medica*, with reference to a specified but unmeasured quantity (a little bit) and is used as a vehicle to combine other ingredients together.

3) **Infusion**[144,145] (I:2:19): Infusion as a pharmaceutical form occurs once within books 2-5 of MB. A quantity of 30 dirhams of white honey is added to other ingredients and the resulting mixture is left in the sun to steep and the result is an infusion.

   In this case honey is mentioned in the main list of *materia medica* in a specified, measured quantity which indicates that it is being used as an active ingredient in the infusion.

4) **Plaster**[146,147] (I:2:28): Plaster as a pharmaceutical form occurs once within books 2-5 of MB. Honey and milk are mixed with other ingredients and the resulting mixture is to be applied directly to the skin of the face as a plaster.

   In this case honey is mentioned after the main list of *materia medica* in a specified but unmeasured quantity (a little bit). Furthermore, in this prescription honey may be used interchangeably with other viscous liquids (psyllium mucilage or yoghurt). This indicates honey is used as a vehicle for the combination and/or administration of the other ingredients.

5) **Decoction**[148,149] (I:3:5, I:3:23, I:3:27) Decoction as a pharmaceutical form occurs three times within books 2-5 of MB. In all three cases, honey and ground ingredients are added at final stages of the preparation of a decoction.

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[141] مرهم - مرهمات, مراهم
[142] For more on ointments/salves see: Fellmann 1986: 240.
[143] مرهم العسل
[144] نقوع
[145] For more on infusions see: Fellmann 1986:251.
[146] ضماد
[147] For more on plasters/dressings see: Fellmann 1986:188
[148] مطبوخ
[149] For more on decoctions see: Fellmann 1986:245.

I:3:5: In this case honey occurs after the main list of *materia medica* without reference to quantity and is used as a vehicle to combine other ingredients together.

I:3:23: As above, this case honey occurs after the main list of *materia medica* without reference to quantity and is used as a vehicle to combine other ingredients together.

I:3:27: Again, honey is mentioned after the main list of *materia medica* without reference to quantity and it is used as a vehicle to combine other ingredients together.

6) **Medicinal Potion**[150,151] (I:3:19 [1], I:3:21 [1], I:3:38, I:3:40 [1], I:3:40 [2]): Medicinal potion is the most frequent pharmaceutical form across books 2-5 of MB as a whole and makes up a total of 5 out of 33 mentions. Medicinal potion as a pharmaceutical form occurs only in book 3 of MB.

   In all of these cases, honey is a named substance in the name of the potion (malabathrum honey potion or acacia honey potion) however, without further information like a prescription for the potion or instructions for how it is prepared, it is not possible to determine whether honey acts as an active ingredient or a vehicle in any of these cases.

7) **Smoke Inhalation**[152,153] (I:3:19): Smoke as a pharmaceutical form occurs once within books 2-5 of MB. Tamarisk honey and other ingredients are burned and then inhaled.

   In this case honey occurs in the main list of *materia medica* along with the instructions for how to prepare the bottle that is used in the treatment. Though quantity of is not specified, it is to be used in equal quantity to the other substances in the treatment. Without more information it is unclear whether honey is used as a vehicle or active ingredient in the treatment.

8) **Drink:** Drink as a pharmaceutical form is mentioned two times (I:3:8, I:3:38) between books 2-5 of MB. In both cases I:3:8 and I:3:38, a type of honey is boiled together with other ingredients to produce the medicinal potion.

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[150] شراب - أشربه

[151] For more on medicinal potions see: Fellmann 1986:269.

[152] دخنة - دخن

[153] For more on inhalation see: Fellmann 1986:178 and for more on smoke see: Fellmann 1986:188.

I:3:8: In this case an unspecified quantity of honey is used as a vehicle to boil radish and salt to make the drink. It could also be the case that honey is being used as an active ingredient here but there is not enough evidence to make this assertion.

I:3:38: In this case an unspecified quantity of honey is used as a vehicle to boil dill and salt to form the drink. As in I:3:8, it is possible that honey is being used as an active ingredient but again there is a lack of evidence to determine this.

9) **Gargle**[154,155] (I:3:20): Gargle occurs as a pharmaceutical form once within books 2-5 of MB. To prepare the gargle several dry ingredients should be warmed in honey.

   In this case an unspecified quantity of honey is used as a vehicle to combine and warm other ingredients.

10) **Enema**[156,157] (I:3:25): Enema occurs as a pharmaceutical form once within books 2-5 of MB. A desired quantity of honey is added to a number of other liquid and dry ingredients and then incorporated together in a mortar. The result is the solution to be used for the enema.

    Honey is used in a 'desired quantity' as a vehicle for the incorporating of other ingredients.

11) **Consumed** (I:3:27 [2]): Consumption occurs once as pharmaceutical form within books 2-5 of MB.

    In this case an unspecified quantity of honey is boiled with salt and radishes and consumed. Here it is unclear if honey is used as an active ingredient or a vehicle as the specific instruction is to boil and then consume the three ingredients together.

[154] غرغرة - غرغرات
[155] For more gargles see: Fellman 1986:196.
[156] حقنة - حقن
[157] For more on enemas see: Fellman 1986: 209.

12) **Syrup**[158] (I:3:27 [3]): Syrup as a pharmaceutical form occurs once within books 2-5 of MB. In book 3, in a reference of a treatment for epilepsy, honey should be added to a decoction to give it a syrup consistency.

This specific mention of honey is in reference to another physician's work. Not enough information is provided to determine if honey is used as a vehicle or active ingredient in this case.

13) **Electuary**[159,160] (I:3:31 [1],[2]): Electuary as a pharmaceutical form occurs twice within books 2-5 of MB. Honey and other ingredients are kneaded together and the result is an electuary.

I:3:31 [1]: In this case an unspecified quantity of honey is used as a vehicle to combine other ingredients.

I:3:31 [1]: In this case an unspecified quantity of honey is used as a vehicle to combine other ingredients.

14) **Eye drops**[161,162] (I:4:25): Eye drop as a pharmaceutical form occurs once within books 2-5 of MB. Honey is mixed into a fenugreek decoction to form the solution for the eye drop.

In this case a specified, unmeasured quantity of honey (a little bit) is mixed into the prepared decoction and not as a vehicle for the combination of ingredients. It is most likely that honey is used as an active ingredient.

15) **Eye salve**[163,164] (I:4:26 [1],[2], I:4:39): Eye salve as a pharmaceutical form occurs three times within books 2-5 of MB.

In all three cases, an unspecified quantity of honey is used as a vehicle to mix with other ingredients to form a paste or salve that is applied to the eye area.

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[158] شراب
[159] معجزن - معجونات
[160] For more on electuaries see: Fellmann 1986: 227.
[161] قطرة
[162] For more on eye drops see: Fellmann 1986: 255.
[163] شياف - شيافات
[164] For more on eye salves see: Fellmann 1986: 272.

16) **Nasal Drops**[165] (I:5:8): Nasal drops as a pharmaceutical form occur once within books 2-5 in book as part of a treatment for necrosis of the nose. Honey is mixed with a substance and then dropped into the nose.

In this case an unspecified quantity of honey is mixed with another substance and inserted into the nose. Considering that there is only one other ingredient in this treatment, it is unclear if honey is used as an active ingredient in the treatment or as a vehicle for the administration of the other ingredient.

17) **Insertion into Ear on Vehicle** (I:5:16, I:5:20, I:5:23): Within books 2-5 of MB, honey is mixed with other ingredients and administered via insertion into the ear on some kind of vehicle (cotton or wool).

In all three cases, honey is used as a vehicle to mix the ingredients together and to aid in their administration to the ear canal.

18) **Ear Drops**[166] (I:5:27 [1],[2]): Within books 2-5, honey is administered via ear drop twice. Ingredients are mixed or added to honey the resulting mixture is dripped into the ear.

In both cases honey is used as a vehicle to mix the other ingredients together to form a paste that can be administered to the ear as a drop.

19) **Unspecified pharmaceutical form** (I:3:21[2], I:5:13): In both of these cases, it is not specified which pharmaceutical form honey is to be taken in. In mention I:3:21[2], it is only mentioned that honey should be used to "strengthen and purify the stomach" and in mention I:5:13 there is only an instruction to "mix honey" with some other ingredients.

I:3:21[2]: In this case an unspecified quantity of honey is used as an active ingredient for a clearly stated use.

I:5:13: In this case the information provided about honey is too minimal to make a determination on whether it is used as an active ingredient or as a vehicle.

[165] For more on nasal drops see: Fellman 1986: 252.
[166] For more on ear drops see: Fellmann 1986: 255.

Based on this account of the pharmaceutical forms that appear in relation to honey use books 2-5 of MB we can note that honey is used as a vehicle in 20 cases, as an active ingredient in 3 cases and that in 10 cases it is not clear[167] whether it is being used as an active ingredient or as a vehicle (or both). Furthermore, we have observed that honey is used in a diverse range of pharmaceutical forms for external as well as internal use.

3.4 Approach to Treatment: Prescription, Regimen and Practical Treatment

This study found that in all mentions in books 2-5 of MB, honey is used either as part of a prescription, a regimen or a practical treatment.

3.4.1 Prescription

The prescriptions which mention honey in books 2-5 of MB include the following elements: list of materia medica, quantities of ingredients included in the prescription, instructions for preparation and instructions for use. In books 2-5 of MB honey is mentioned as part of a prescription 14 times in total: (I:2:1, I:2:18, I:2:19, I:3:5, I:3:23, I:3:25, I:3:27[1], 1:3:27[3] I:3:31[1], I:3:31[2], I:4:26[1],I:4:39, I:5:16, I:5:20).

3.4.2 Regimen

Regimens usually include some form of dietary recommendations or practical steps that the patient takes as either a standalone treatment or as part of a wider course of treatment. In books 2-5 of MB honey is mentioned as part of a regimen 8 times in total: (I:3:8, 1:3:19[1] 1:3:21[1], I:3:21[2], I:3:38, I:3:39, I:3:40[1], I:3:40[2]).

3.4.3 Practical Treatment

Practical treatments in books 2-5 of MB are those that the author designates 'treatment' (*'ilāj*) or doesn't designate 'prescriptions'. There are 11 cases in books 2-5 of MB where mentions of honey occur as part of practical treatments (I:2:28, I:3:19[2], I:3:20, I:3:27[2], I:4:25, I:4:26[2], I:5:8, I:5:13, I:5:23, I:5:27[1], I:5:27[2]).

[167] Or it there is not enough information to determine this.

3.5 Quantity

When conducting the research entailed by this thesis, the quantity of honey used emerged as a key factor in the way that honey was described. It became apparent that in many cases stipulating the quantity of honey that was to be used in a treatment was not done for some reason whilst in some cases some form of quantity was specified, whether that was in vague unmeasured terms or a specific measurable quantity. This became an area of interest in the research because the quantities of other *materia medica* in the materials are often noted meticulously and very specifically whereas the quantity of honey to be used in any given treatment is mostly vague with a specific, measurable quantity mentioned only once. This led me to assume that in the cases where quantity is not specified that honey is being used as a base or vehicle for other substances and where quantity is mentioned honey could be being used as an active ingredient. Further research devoted to testing this assumption would be informative and could form the basis for further study of MB, but would need to be tested separately and on a more extensive material and thus remains outside the scope than the present thesis.

In books 2-5 of MB, the quantity of honey that is to be used in any given case is conveyed in three ways: as a specified and measured quantity, as specified and unmeasured quantity or no quantity suggested at all. In this subsection these three categories will be discussed further.

3.5.1 Specified, measured quantity

In one mention of honey (I:2:19) in books 2-5 of MB, an exact measurement of honey to be used is provided.

- Prescriptions: In this case, white honey is used in a prescription of an infusion. The quantity of white honey that should be added in the preparation of the infusion is specified as 30 dirhams.

Though honey is mentioned as part of a prescription 14 times in total, it is only in this one case that a specific measured quantity of honey is ever stipulated. It is also the case that white honey is mentioned in the main list of ingredients for the prescription, which is the only instance in any prescription in books 2-5 of MB where this is so[168]. In all other instances where honey is mentioned as part of a prescription it is mentioned after the main list of ingredients in the instructions for its preparation. This is particularly notable when considering that one of the elements of a prescription in books 2-5 of MB is that specified, measured quantities of *materia medica* are provided.

[168] In all other prescriptions in books 2-5 of MB, the mention of honey occurs after the main listing of ingredients in the prescription in the instructions for the prescriptions preparation.

3.5.2 Specified, unmeasured quantity

In four mentions of honey (I:2:18, I:2:28, I:3:25, I:4:25), honey is to be used in a specified but vague quantity. In these cases, the quantity of honey to be used is specified as ‘a little bit’ or as ‘a desired quantity’. In three of those mentions, (I:2:18, I:2:28, I:3:25) honey is used as part of a prescription and for two (I:2:28, I:4:25) it is used in a practical treatment.

3.5.3 No quantity suggested

In all other mentions of honey which occur as part of prescriptions, practical treatments and regimens, no quantity of honey is mentioned at all.

- Prescriptions: In the majority of mentions of honey that occurs as part of a prescription (I:2:1, I:3:5, I:3:23, I:3:27 [1], I:3:27 [3], I:3:31 [1], I:3:31 [2], I:4:26 [1], I:4:39, I:5:16, I:5:20) no quantity of honey is suggested. This is noteworthy when it is highlighted that in books 2-5 of MB, prescriptions quantities of *materia medica* that are found in the main list of ingredients of a prescription are noted in exact detail. With this considered, it is possible that honey, when mentioned after the main list of ingredients in a prescription and without reference to quantity its use is different to those *materia medica* that are included in the main list of ingredients with quantities provided.

- Regimens: In all mentions of honey that occur as part of a regimen (I:3:8, I:3:19 [1], I:3:21 [1], I:3:21 [2], I:3:38, I:3:39: I:3:40 [1], I:3:40 [2]) the quantity of honey to be used is never specified.

- Practical Treatments: In nine mentions of honey that occurs as a practical treatment (I:3:19, I:3:20, I:3:27, I:4:26 [2], I:5:8, I:5:13, I:5:2, I:5:27 [1], I:5:27 [2]) no quantity for honey is suggested. It is the case that quantities of substances that are used in practical treatments are not specified in the same way as they are in prescriptions.

Based on this account of the quantity of honey in books 2-5 of MB it can be noted that a mention of honey is mentioned with a specific and measured quantity 1 time, with a specific and unmeasured quantity 4 times and with no specified quantity 28 times.

4 Conclusion

This thesis has explored the uses of honey in books 2-5 of MB, paying particular attention to how quantity, means of administration and mode of preparation serve as indicators of these uses. I have detailed every step of the methodological steps I took towards the aim of enumerating and analysing the uses of honey in books 2-5 of MB. Through these methodological steps, I have been able to work through and decipher large amounts of challenging handwritings to shed light on the breadth of ways that honey is put to use in this volume. Additionally, I have conducted an in depth analysis which examines uses of honey not only on a mention-by-mention basis but also on the basis of categories of shared characteristics. In doing this it has been possible to elucidate upon the wide range of uses that honey is employed towards in books 2-5 of MB by providing descriptions of the uses of honey and contextual details of each mention and then searching for the core patterns that emerge from that data that allowed me to form more generalisable conclusions. I also identified three key factors that influence the way that honey is described in the text and managed to adapt these factors into a tool to aid in my analysis of how honey is used in the text.

One of the key conclusions that has emerged from the analysis of the data is that honey is a versatile substance that has both medicinal and non-medicinal applications in MB, sometimes concurrently. Honey has a diverse range of applications and is used in the treatment of a wide range of diseases. Furthermore, through sorting the mentions of honey into categories based on type, it has been possible to identify trends and patterns in the data that have allowed me determine the usages of honey in cases where the author hasn't explicitly elucidated them. With reference to sources that provide great detail about the medical and pharmaceutical practices of the period it also has been possible to derive the intended uses of honey, particularly in prescriptions, where they haven't been immediately clear. The findings of this thesis are in line with what researchers have found regarding honey and its uses in similar works of the period however the main contribution of the work presented here is its specificity to the text *al-Mu'ālajāt al-Buqrāṭīyah*. I hope that the methodological steps undertaken in this study may provide another researcher with the foundations to conduct similar studies on *al-Mu'ālajāt al-Buqrāṭīyah* and the other works of Abū al-Ḥasan al-Ṭabarī.

Suggestions for Further Research

There are several avenues of further research that this thesis could lead to. The most apparent further study would be to use the methodological approach outlined in this thesis to conduct a similar investigation for all mentions of honey across the remaining books of MB (books 6-10). With respect to this, I preliminarily explored the link between measured quantity and honey as an active substance in books 2-5 and further analysis based on this presupposition could be explored separately as a hypothesis based study with a more extensive set of mentions of honey covering the whole of MB. This avenue would be instrumental for determining the effects that ancient medical practitioners were expecting from using honey in pharmaceutical and medicinal applications.

Furthermore, the methods employed by this study could be used to study the approximately 1000 other substances other than honey that are mentioned in books 1-10 of MB. Aside from constructing a methodological framework, one of the key parts of this research involved determining the means of preparation of honey and a lot of the information regarding this was encoded in single verbs. Given that a single verb in the Arabic language can convey what might be a complex instruction in English, a deeper dive into how and why specific verbs are used to convey different modes of preparation could potentially shed more light into how the author intended his work to be received by practitioners.

Additionally, through close comparison of the three separate manuscripts involved in this thesis, I observed some similarities between scribal errors that led me to speculate whether one of these manuscripts may have been a copy of another. Although it was outside the scope of this thesis to delve into this research problem myself, comparing these manuscripts to determine what relationship, if any, they have to each other is another avenue for another researcher to explore. I also highlighted that some of the means of preparation in MB are book-specific and so research into honey and other substances in honey on a book-by-book basis could contribute to our understanding of how specific substances were used, or not used, to treat specific parts or systems of the body. Another factor that I highlighted is the type of honey used for different prescriptions, regimens and treatments which can aid the study of the other substances mentioned in MB through a similar lens. A study on the types of honey used during the period and what they were used for would be another interesting angle to pursue.

Finally, I hope research into Abū al-Ḥasan al-Ṭabarī's influential work *al-Muʿālajāt al-Buqrāṭīyah* continues among researchers in fields relevant to its content so that eventually a full critical-edition may be available.

Appendix A

This table provides the corresponding page and line numbers of all of the mentions of honey in books 2-5 of MB across the facsimile edition, the BL manuscript and the OL manuscript.

Reference	Facsimile Edition	British Library Manuscript	Osler Library Manuscript
I:2:1	page 57, line 15	page 113, line:13	page 139, line 8
I:2:18	page 75, line 7	page 145, line 22	page 177, line 15
I:2:19	page 78, line 5	page 151, line 9	page 186, line 7
I:2:28	page 86, line 23	page 166, line 19	page 210, line 3
I:3:5	page 99, line 2	page 187, line 8	page 243, line 13
I:3:8	page 102, line l2	page 194, line 11	page 253, line 15
I:3:19 [1]	page 114, line 11	page 216, line 22	page 287, line 2
I:3:19 [2]	page 114, line 17	page 217, line 8	page 287, line 12
I:3:20	page 117, line 9	page 222, line 8	page 295, line 6
I:3:21 [1]	page 112, line 13	page 230, line 7	page 307, line 9
I:3:21 [2]	page 121, line 15	page 230, line 10	page 307, line 12
I:3:23	page 125, line 21	page 238, line 20	page 319, line 16
I:3:25	page 129, line 2	page 245, line 4	page 329, line 6
I:3:27 [1]	page 131, line 24	page 250, line 9	page 337, line 5
I:3:27 [2]	page 132, line 13	page 251, line 9	page 338, line 15
I:3:27 [3]	page 134, line 20	page 255, line 9	page 344, line 17
I:3:31 [1]	page 142, line 5	page 268, line 22	page 365, line 9
I:3:31 [2]	page 147, line 20	page 280, line 5	page 381, line 10
I:3:38	page 162, line 15	page 307, line 13	page 423, line 15
I:3:39	page 165, line 2	page 312, line 1	page 430, line 16
I:3:40 [1]	page 168, line 20	page 318, line 24	page 440, line 14
I:3:40 [2]	page 168, line 21	n/a	page 440, line 16

I:4:25	page 209, line 19	page 400, line 23	
I:4:26 [1]	page 210, line 17	page 403, line 16	
I:4:26 [2]	page 210, line 21	page 404, line 1	
I:4:39	page 225, line 15	page 436, line 7	
I:5:8	page 253, line 26	page 492, line 1	
I:5:13	page 257, line 7	page 498, line 3	
I:5:16	page 261, line 20	page 506, line 21	
I:5:20	page 263, line 23	page 510, line 18	
I:5:23	page 264, line 24	page 512, line 22	
I:5:27 [1]	page 267, line 16	page 518, line 6	
I:5:27 [2]	page 267, line 19	page 518, line 12	

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OL Manuscript: al-Ṭabarī, Aḥmad ibn Muḥammad, al-Muʿālajāt al-Buqrāṭīyah (1215), McGill University Osler Library, OL 225, (Accessed June 2023 via https://archive.org/details/McGillLibrary-108939-443/page/n209/mode/2up)

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