15th Century English Mead: Initial Review of Hydromel, Metheglin, and Melomel Recipes in Wellcome MS.MSL.136

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Abstract

Wellcome MS.MSL.136, a mid-15th century collection of medical recipes, includes three recipes for mead (honey wine). Analysis of the details of the recipes and comparison to the corpus of English and European mead recipes of the same period illuminates aspects of mead making and consumption in Medieval England. Additionally, it provides specific connections to practices in other periods and geographies, gives insights into changes in mead recipes and use over time, and highlights areas for additional investigation. These recipes show the duality of mead in the medieval period as a drink of medical and recreational significance, with recipes originating locally and remotely, historically and contemporaneously. The first recipe in the manuscript is a metheglin (mead with herbs, originally medicinal), one of several versions of a single early recipe for this Welsh medicinal drink, each with significant differences of ingredients and methods. This recipe contains the earliest known use in mead of an egg as a method to measure specific gravity (sugar content). The second recipe is an early example of a fruited mead (melomel) in a currently unique recipe that appears to be recreational in nature. This melomel uses wine lees to aid fermentation. The third recipe, later in the text, contains only honey and water and is likely intended to serve as a medicinal substrate. Versions of this “ydromell” recipe appear widely in texts derived from Byzantine and Arab medical sources. This recipe also shows an intriguing use of “sour leven” or sourdough yeast.

Keywords: Mead, Brewing, England, Medieval Brewing, Medieval History, Mead History, Fermentation, Mead Recipes, Medieval Mead, Fermented Beverages, Metheglin, Hydromel, Melomel, Culinary History, Medieval Medicine
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Specifcsof how mead was made and used during the Middle Ages remain relatively unexplored. Studies have typically mentioned mead tangentially as part of more general studies, usually on food (see Hagen, 1992; Hammond, 1993; Scully, 1995), or are focused on the cultural and ritual role of the drink and its appearances in poetry and prose (see Arnott, 2015; Enright, 1996). Detailed information is available on the etymology of names for mead (see Cornell, 2008; GPC Online, 2014; Lewis et al., 19522001, Simpson et al., 1991). Sources establish that mead was widely known throughout the Medieval Period and had significant status and repute, but give few to no specifics of the creation of the drink or its specific nature (see Minnick, 2018). The details of available mead recipes, including ingredients, equipment, and methods of production, compared to each other and placed in historical context, provide valuable insights into the history and nature of mead, the technical and social environment in which it was made, and how these changed over time.

This study outlines results of an initial review of three mead recipes contained in A Collection of Remedies Wellcome MS.MSL.136 (hereafter MS.MSL.136), a mid-15th century English-language medical manuscript. The specifics of each recipe were reviewed in detail and compared to other historical mead recipes using the author’s catalog of almost 900 European mead recipes and variants dating from before the end of the 16th century. Each of the recipes was also examined in the context of the manuscript, existing technical and practical processes and equipment for mead making, and the nature of the drinks likely to be produced from the recipes.

The three recipes in MS.MSL136 highlight complex aspects of transmission of mead recipes, including the nature of the intertwined medical and recreational traditions of mead making. In broader context, conclusions can be made about techniques for mead production with their implications for technical knowledge, and how mead recipes and mead making changed

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1 Angotti, unpublished. The catalog tracks data for each recipe and variant on: the source text, geography and language, and specifics of the recipe such as ingredients, core honey:water ratio, equipment and timing of mead making process. The recipes are a subset of over 3500 catalog entries dating up to 1750 CE.

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over time, including influence of political and economic factors on mead making. Finally, it is observed that all of these factors have implications for the character of the resulting drink.

Mead is used here as a general term for a drink fermented using honey as the primary fermentable sugar. It is inclusive of the drinks which may be called hydromel, metheglin, melomel, etc. It is worth noting that the meanings of these names vary across historical periods, and have often been assigned specific meanings in modern mead making that do not match historical usage.

Figure 1: MS.MSL.136 f.89v Ydromell Recipe (Credit Wellcome Collection CCO)

The Manuscript

The Wellcome Library in London houses a large collection of historical manuscripts, focusing, following their mission, on the history of medicine. Historical connections between medicine and food/drink, coupled with mead’s connection with both these worlds, makes these manuscripts fertile ground to find recipes for mead. One relatively early (mid-15th century) English medical manuscript (MS.MSL.136) is an example, and is notable because the mead recipes appear to be heretofore unknown to modern mead historians.

The Wellcome Library catalog entry for MS.MSL.136 titles it A Collection of Remedies. It is dated to the mid-15th century based on paleography and writing style. A reference in one of the last recipes in the MS states, “proved upon my Lord John, Duke of Somerset, in the Lent-time when he went over the sea” (MS.MSL.136, f.94r). John Beaufort became Duke of Somerset in 1443, was in Normandy until 1444, and died later in that year. The wording is interpreted by Dawson (1934, pp.23) to suggest he was still alive when the text was written, dating the manuscript to 1443 or early 1444.
The manuscript contains three sections. The first of these, occupying the first 95 folios and the majority of the MS, is a group of 1073 recipes, prescriptions and instructions. These are organized roughly alphabetically according to a mixture of body parts, diagnoses, and drug names. The majority are recipes for treating injuries or diseases; some diverge into topics such as unlucky days and the best times to gather various herbs. The second section of the MS consists of two folios providing a glossary of plants and their medical properties covering the initial letters A through F. The third section is a single folio of additional recipes.

A side-by-side semi-diplomatic and normalized transcription of the first section of the manuscript was published in 1934 (Dawson). A complete scan of the original manuscript is available on the Wellcome Library web site\(^2\).

The entirety of the manuscript is written in a single hand. Dawson (1934, pp.45) theorizes that the manuscript was copied in its entirety from a previous version, rather than being compiled at the time it was written. The catalog description indicates paragraph marks were not always inserted in the correct locations, and that there are a number of textual mistakes and omitted words. These details suggest the copyist may not have had specific understanding of the material.

![Figure 2: MS.MSL.136 first page (Credit Wellcome Collection CCO)](image)

The medical focus of MS.MSL.136 is typical for 14\(^{th}\)16\(^{th}\) century English-language manuscripts containing mead recipes. Almost two-thirds of the 34 manuscripts currently known in this group are focused on medicine (Angotti, unpublished). Other 14\(^{th}\)16\(^{th}\) century English-language manuscripts containing mead recipes have core topics such as cookery (Hieatt & Butler, 1985), farming (Lodge, 1873), and encyclopedic collections of information (Anglicus &

\(^2\) Accessible through the catalog entry.

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Trevisa, 1st quarter 15th c.). It is worth noting that several of the mead recipes in English-language 14th-16th century manuscripts are in manuscripts where there is no obvious connection between the recipe and other contents (Peregrinus, 14th c.).

The first two mead recipes in MS.MSL.136 are located close to each other. The first is “For the cough a precious drynke and for the brest and is clepid mede eglyn” (MS.MSL.136, ff.21v22v). This medicinal recipe uses three dozen herbs in addition to a slate of spices. After one intervening recipe, the mede eglyn is followed by “An other gode drynke” (f.22v) featuring the use of fruit and honey. This recipe appears to be more recreational in nature than medicinal.

The final mead recipe is much later in the text, “To make ydromell” (f.89v) is a plain mead made with only honey and water. The wording and presentation of this recipe connect it to a robust medicinal mead tradition spread from eastern and southern parts of Europe.

**Medicine, Mead, and Humors**

Mead in the historical record is often suspended between medicine and cookery, husbandry (farming and outside activities) and housewifery (cooking and indoor activities). Because MS.MSL.136 is medical in nature, the medical identity of mead is central to the context of the recipes.

In keeping with the humor theory governing most European medicine until the middle of the early modern era (16th18th c.), the humor properties of food and drink were integral to recovering or maintaining health.

Humourism is a theory of medicine first documented in Greek writings of the 5th century BCE. It is based on the idea that health is governed by essential fluids: blood, yellow bile, black bile, and phlegm. Balancing these humors to achieve and maintain health was a core goal of Western medicine theory for two millennia. The original theory included only the correlation of the substances and seasons with their characteristics of hot/cold and wet/dry. Galen in the 2nd c. CE expanded this to include connections to the ages of man and the elements (Jouanna, 2012). The final elements of the human temperaments were added a few centuries later. The associations are shown in the figure below.

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3 Spices in the context of historical mead recipes are self-defined as a relatively small group of ingredients typically added together and called spices; this does not follow the modern culinary definition of spice. For the purposes of the catalog, almost all other additions, including many that are technically spices (buds, barks, roots, or aromatic seeds) are considered herbs based on how they are grouped and processed.

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Based on this humor theory, medicine focused on applying the attributed properties of herbs, food, and drink to balance humors. For example, a hot and dry herb or a compound such as mead would counteract an abundance of cold and wet phlegm. Dalby (2010) translates the 2\textsuperscript{nd} c. CE Byzantine \textit{Peri Trophon Dynameos}:

\begin{quote}
Mead has more heat and dryness than any wine. It is suited to those with cold and moist temperaments and constitutions, and in cold weather and in cold climates. It is cleansing and purgative of thick and phlegmatic residues in the stomach. It produces urine and encourages urination remarkably, and gives a good facial complexion. Some people mix in hot spices when making mead. (p.126)
\end{quote}

Mead (as well as wine and ale), in addition to having its own character was often used as a carrier for medicines, the plain drink adulterated to produce a medicinal beverage. Maceration (extraction by soaking a solid) and boiling were both common techniques. In MS.MSL.136, wine (76 uses) is the most common alcoholic medicine carrier followed by ale (44 uses); mead is used only three times\textsuperscript{4}.

Mead recipes and references to mead use in herbals and pharmacopoeias suggest that many simple medicines (with a single component) were macerated in mead after fermentation rather than mixed into must and then fermented. More complex preparations were often

\footnote{\textsuperscript{4} Only those uses resulting in a liquid medicine intended for drinking are included here. Wine, ale, and mead are also used in recipes intended for external use and ones that are made into pill/ointment form.}

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fermented with the medical additions rather than macerated. It is not clear whether these sources made a distinction between the expected effects of medical herbs or other materials fermented with mead (or wine, or ale) compared to the same material macerated or boiled in the drink after fermentation. A likely reason for adding herbs after fermentation is the purely practical one of being able to make different medicines at need using a plain carrier, rather than maintaining a number of medicines and risk waste of unused medicines or not having one available at need.

Ydromell (Hydromel) Recipe

The last of the recipes sequentially in MS.MSL.136 is the simplest, and has the broadest connection to historical mead making and mead in a medical context, despite the fact that it is not given a specific medical use. The recipe as written in MS.MSL.136 states:

To make ydromell Take a galon of rennynge water & a pynt of clarified hony and boyle hem wele togedir a myle way & some it clene and streyne it & put it in an erthen pot & lat stand ij days or ye drynk it & when it is cold tak a quantitee of soure levyn as grete as a costard & put it ther in. (f.89v)

Recipe Elements

Establishing the existence of a group of related recipes involves analysis of similarities and differences between multiple recipes, and evaluation of whether the similarities are sufficient to indicate linkage. Of particular interest are groups of ingredients, distinctive instructions, specific equipment, and phrases with notable terminology. For example, one identified group of recipes uniformly instructs the user to leave three fingers space free in the barrel while fermenting; diverse recipes in multiple groups call for fermentation in a barrel in the sun for 40 days during the dog days of summer (canicular days).

The key elements of this recipe that aided in identifying related recipes are:

- Medical context of writing.
- Instructions with little elaboration.

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5 Semi-diplomatic transcription is used throughout this paper, with some aspects of a normalized transcription. Word choice, spelling, and punctuation are maintained. Old letter forms are modernized, abbreviations and ligatures are silently expanded, line divisions are not noted, and capitalization is generally normalized.

6 The “three finger” recipes have been cataloged in 39 documents over an almost 400-year period and have been published in Germany, England, France, Netherlands, and Sweden (Angotti, 2021).

7 Columella’s (d. c. 70 CE) de re Rustica (Book XII, CH. XII), uses these instructions, for example in a 1521 edition a mixture of honey and water “patiuntur per caniculae ortum in sole qua draginta diebus esse” (will be put in the sun for forty days at the rising of the dog-star) (Libri de re Rustica, 1521).
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- Honey and water as the only ingredients.
- 1:8 ratio of honey to water.

Other notable elements of which did not result in identification of potentially related recipes\(^8\) include:

- English language and geography.
- Two-day fermentation period.
- Details of ingredients including: “running water”, “clarified honey”, “earthen pot”, “sour leaven”, and “size of a costard”.
- Preparation instructions including: “boiling a mile way”, scumming, and straining.

The first of these applied to diverse recipes. The remaining three were either unique or present only in recipes without other correlating factors.

**Related Recipes**

Hydromel (Latin: water honey) is used historically as a general term for mead, but is more likely to refer to a drink made only from water and honey\(^9\). Plain mead recipes appear historically in both medicinal and recreational contexts. The 1:8 honey to water ratio is the most common ratio in historical mead recipes. About one in four recipes using this ratio is a plain mead, compared to one in six or seven for all recipes. For recipes from before the 17\(^{th}\) century, about 40\% of the 1:8 ratio recipes are for plain meads and almost all of these are presented in a medical context (Angotti, unpublished)\(^{10}\).

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\(^8\) The recipe catalog and transcribed text of recipes were reviewed first for recipes containing duplicate wording, including likely spelling variations, and then for phrases/instructions with the same effect.

\(^9\) The Middle English Dictionary gives the primary meaning for idromel as “A mixture of honey and water used for medicinal purposes” (Lewis, et al., 1952-2001).

\(^{10}\) Some of this disparity may be due to multiple entries of the recipe due to its appearance in multiple texts.

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The 1:8 honey:water plain meads appear frequently in recipes associated with several early medical writers/compilers. The most common attribution is to Mesua (Yuhanna ibn Masawaih (c.777857)), of Baghdad and Samarra in modern Iraq (see Mesua, 1497, p.64). Oribasius (c.320403) is the earliest specifically named source for this recipe; he was a Greek trained in Alexandria, and personal physician to the Roman Emperor Julian ruling from Constantinople (see Bock, 1550, p.32r). Paulus Aeginetae (c.625c.690), is named in other recipes; he was also associated with the school of Alexandria, and was a Byzantine Greek medical compiler whose works were used in Arabian medicine (see Aeginetae, 1541, p.124). Later, Praepositus (Nicolaus Salernitanus, fl.1140) a teacher at the Southern Italian Schola Medica Salernitana, includes the recipe in his Antidotarium Nicolai which may have drawn from any of the previous sources (see Praepositus, 1491, Book II, p.XXXVIIr).

The 1:8 honey:water ratio does not appear to have a source in the writings of earlier Mediterranean-area Greek and Roman authors. It is not seen in recipes from writers including Columella (4 CE-c.70 CE), Pliny (23-79 CE), Dioscorides (c.40c.90 CE), or Palladius (2nd half 4th-first half 5th c.). All give recipes for plain mead that consistently use different honey to water ratios, with 1:2 and 1:3 being most common (Angotti, unpublished).

The ultimate source or sources of the 1:8 honey:water hydromel recipe remains unclear. The genealogy of its transmission perhaps starts in Roman Constantinople, extending into the Arabian medical community before moving back into the European medical tradition (where it may or may not have otherwise lapsed), becoming a standard recipe in European medical pharmacopoeias from the 13th century.

Texts from of all four of the writers associated with early medical versions of the 1:8 recipe can be reasonably expected to have been known in England during the 14th and 15th centuries when MS.MSL.136 was written/copied. Details of origin and ownership for Latin manuscripts are scant, making it difficult to establish which were in England in this period.

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However, there are numerous manuscripts from these authors listed in the manuscript catalogs of the British Library, the Wellcome Library, and other British repositories.

Two examples of 1:8 recipes with significant correlation to the MS.MSL.136 hydromel appear in the 1491 *Dispensarium ad Aromatarois* of Nicolaus Praepositus published in Lyon, France. The first reads:

*Aqua mellis primi modi D. OJ.*

Rx. Mellis boni & mundati partem i. ponatur in vase lapideo aut vitreato & funde super ipsum aquae fontis dulcis & clare partes viij. Coque cum facilitate & auferatur spuma eius: & non dimittantur supra ipsum multiplicari: imo quamcito apparat auferatur. Deinde coletur colatorio depresso de panno. (Book II, p. XXXVIIr)

This can be translated as:\(^{11}\): *Aqua Mellis the first way. Recipe:* One part of good and clean honey placed in a stone or glass vessel. Pour over it 8 parts of sweet and clear spring water. Cook it easily and remove the foam. And do not allow it to increase above itself. As it appears immediately remove it. And then strain it through a cloth.

The second version closer to MS.MSL.136, it reads:

*Aque mellis secundi modi D. eiusdem mess.*

Rx. Mellis patem i. aque fontis clare partes viij.

Distemperetur cum eis parum fermenti: scilicet ad omnes lb. aque & mellis sint eius \(\frac{3}{3}\) iij. Et includantur in vase ligneo sicut ponitur mustum: ita qui remaneat ex vase vacuum sicut mensura digitorum. Et illud ideo que patitur de ebullitone sicut mustum. Deinde post ebullitonom eius stringatur orificium vasis sicut stringitur vas vim. Et bibatur post tres menses (Book II, p. XXXVIIr)

This can be translated as: *Aque mellis the second way. It is made. Recipe:* One part clear honey and 8 parts of clear spring water. Put them with a little leaven such that to each lb. of honey and water there are 3 ounces [of leaven]. Then place it in a wood vessel that has contained wine must. And leave in the vessel a clear space equal to the measure of a finger. And it will then begin to boil like wine. After it has finished boiling, close the mouth of the vessel tightly. Drink it after three months.

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\(^{11}\) This and later translations by L. Angotti.

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Both of these recipes continue, giving options for adding spices. This is common for the basic 1:8 mead recipe, but does not occur in the MS.MSL.136 version.

Additional details in the MS.MSL.136 hydromel recipe do not match these apparent ancestor recipes. The instruction to boil “a mile away”, the fermentation time, and the specific instructions surrounding yeast addition do not match other currently cataloged versions of this recipe. These additional details suggest revision of the recipe, in one or more stages, between earlier sources and the version in MS.MSL.136, possibly as part of translation from Latin to English, or during transcription by a scribe with knowledge of mead making.

**Sour leaven**

The use of “a quantitee if soure levyn as grete as a costard” in the hydromel recipe is notable not only for demonstrating intentional yeast addition (which is uncommon for recipes in the 1:8 plain mead group and for 15th century recipes), but also for the use of sour leven. The majority of historical mead recipes calling for yeast addition use ale/beer yeast as barm (fermentation foam), dregs, or simply yeast. Use of bread yeast or a fermentation container that has previously held fermenting or fermented liquid (particularly wine), is also seen. Specification of levain or sauerteig (sourdough) is uncommon; most known uses are in German and sometimes French recipes of the second half of the 16th century and later (Estienne, 1576, p.143b; Spindler, 1566, p.296). The recipe in MS.MSL.136 is the earliest known mead recipe calling specifically for sourdough.

Awareness of sourdough as a leavening agent is documented as early as Pliny’s Natural History “but there is another leaven which may be prepared with barley and water, … the cakes are shut close in vessels, until they turn quite sour” (Bostock, 1856, Book 18 Chapter 26).

Interchange of leavening agents between brewers and bakers is indicated in a 1468 Norwich ordinance regulating the sale of barm (also called goddisgood) by brewers which suggest a long-standing practice by indicating “that this ordynance and prouision extende ne streche not to eny olde custome bitwix the seid comon brewers and the bakers of the seid cite” (Hudson & Tingey, 1906, pp.9899).

These pieces of information all indicate a free flow of yeast cultures between brewing and bread making. They also suggest that these cultures were mixed cultures, and could include many different micro-organisms, most notably lactic acid bacteria, which supply the eponymous sour character of sourdough. Yeast cultures can be expected to have varied by geographic area

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and over time. One or more cultures which gave better results for brewing and/or baking would have been sought out and thus come to dominate within a trading circle, but the effective range of these circles would be limited by the difficulties of trading an active yeast culture. Any non-sterile treatment would allow new organisms to enter the culture, changing it over time. Because different microorganisms produce significantly different flavor and character in a mead, the precise yeast culture is a key variable in the expected character and taste of the product.

**After 2 Days, Boiling a mile away**

The instruction to boil “a mile away” almost certainly indicates the time it would take to walk a mile or a mile and back, about 2040 minutes. This specific instruction is not seen in other recipes, but is in line with the time indicated by the common instruction to boil a mead wort while scum still rises. It also mirrors instructions in a 1354 German recipe to boil the must an acre and back (Scully, 1985, p.154).

The instruction for this recipe gives a fermentation period of merely 2 days before it can be drunk. While fermentation and aging times for early meads are often significantly compressed from the modern idea that meads must be fully fermented then aged months before being drunk, this period is notably short. The time may reflect a minimum before starting to drink the product rather than an ideal. In addition, the relatively low sugar concentration in this recipe could ferment to completion relatively quickly if there is a vigorous fermentation.

**Precious Dryne - The Metheglin Recipe**

The most detailed of the three mead recipes in MS.MSL.136 is the first sequentially in the manuscript. At almost 500 words, it is longer than the majority of early mead recipes. The recipe is named “mede eglyn”, which is an alternate spelling for the more common metheglin.

Metheglin is a mead style universally attributed to Wales. The earliest known references date from the 14th century. Initially a medicinal drink, in the 17th century recipes became more recreational in nature, and the name has persisted into the modern day designating a style of mead containing any combination of herbs and/or spices.
Figure 6: Wellcome MS.MSL.136 f.21v Metheglin Recipe (credit Wellcome Collection CC0)

This recipe includes a list of 47 herbs, spices, flowers, roots, and seeds added to the drink. MS.MSL.136 states:

Ffor the cough a precious drynke and for the brest and is clepid mede eglyn and also wyne of tyrie of teibiann and this is the perfite makynge Take the rote of fenell persely with the rote tansay with the rote of Elenacampana / radishe rots the rote of wormode valarian / herb Robert mowser mynt with oute the rots of ech of thies an handfull / mugwort comfery borage levys or lorer / mylfowll / camamyll / violett waybrede hertistunge mede puliall mowntayn / of ech of thies a culpon and sawge ysop saveray tyme lavandre rosemary calamynt mageron scabiouse betayn egremoyn / eufrace turmentill daysee avence of ech of thies ij culpons put all thies in a lede wyth as moch of clene ryver watir as they may easely be boyld in and boyll hem all togedir till the herbis go down to the botomm of the lede and that the rotis be ryght tendur / & then lat hem kele and when / thei are will warme than tho myast handyll heme with owt skaldynghe than / clence and wrynge all thorowe a stronge canvas in to a clene vessell puttyng a way the dass of the erbis and make then thi lede clene and put in thi watir while it is warme and put therto to a pound of licoresse or ij after the quantitee of thi water that is to vj galons of the water a pound of licoresse or more small poundyd to powder and seth it wele and oft cленce it & then to ij galons of this water one of honys for the fynyst / or to ij galons of this water one of honys for the secunde and whether it be that on or the other boyle heme togedr alway skymmynghe with a skymmer till it be clene and aftyr that take it oute and put in to kevers ther to stand opene iiij dayes and then try oute the clere and kest a way the thyke but that shuld be or thow put in thyne hony but after that thou hast put in thm honys and it is cold after the kelyng of iiij dayes then put ther on a potell of barme as brewers doue apon ale fletynge it when it it nedith iiij days or .v. & then tune it in barell or pypis and kepe it as wyne and then take clowes
greynes galyngale peper quybbybs maces nutmuges canell and gynger of ech of thies halve an unce powdredre and put heme ther in & stopp it fast that noone eyer goo owte It shold at the lest lye halve a yere or it were brochid Itt may of hyme selve last vij yere and in the begynnynge when thou puttist in hony in to the water / it is myghty enough if it ber an eye that thow may see a peny brede of the ey above the water (f.21v-22v)

A different hand from that of the main scribe has added a marginal note “a drinke for the cough.”

**Metheglin Recipe Group**

Ten pre-1600 English-language mead recipes using a dozen or more herbs, most of which are titled with some variant of the name metheglin, were compared to the MS.MSL.136 mede eglyn recipe. Two recipes were identified which are closely related to the recipe in MS.MSL.136. A fourth recipe is almost certain to belong to the group but only the first and last lines of the recipe were available for review.

British Library Harley MS 2378 (Spaulding, 1360-1722) is a collection of manuscript pieces collected in the 15th c., with some parts dating to the 14th c. It instructs:

**Meth eglentropy.**

Take the rote of fenel. persel with the rote. tansey with the rote elencampana with the rote. Radiche with the rote. Wormode valerionn an oz herbe Robert. mewser. mynts with owt the rotes tum de uno quuentum de alio. mugworte. comfery. an oz. borage levys of lory. camomyl. violett. waybrede. hertis tonge. wilde sawge hylwort all ylich and to so mekyll as of the tether afore te folium sauge ysope saverey tyme lavender rosmaryn kalamynt scabysouse. betony. egremony turmenttyll. ffiace. avence. iiij handfull of ilkon. put all thise into a lede with also mekyll watyr as you may ben boylyde in wele. and when the herbys be soft boylyde. than with draw the fyre and it sokandy kele. and whan it is lewke then clense hem thorought a fayre clothe and kest a way the herbis. and while it is warme put it into a lede a geyn. and till to galoune of. lycour put a galoune of hony. put thise lycours to gedyr. boylyd and scomyde tyll the be clene. and for to take away the swetnes take to XXa galins of lycour one handfull of tyme (f.5r-5v)

British Library Add MS 14252, dated to the 15th c. (Glanvilla, 1199-1216), gives the following recipe:

**Metheglyn hoc mede fiat & valet plus uma in duplo**

Tak the rote of fenkell persell with the rote of tansay with the rote of Elena Campana with the rote of Radcole with ye rote of Wormod valerian herb Robert mowser mynt
with outen rutes of ilkan of this a handfull mugwort confere borage lefes of loryf
camamell vyolett waybred hertistonge medwort hylwort of ilkon of this a copyn sauge
ysope saveray tyme lavandyre rosemaryn calamynt scabyows betoyn egremoyne
ewfrays turmentyll Dayse avaunce of ilkan of this two gowpyns Put all ther herbes in a
brew lede with als mykell clene watre als thai may esely be boyled in and when the
herbes er soft for buled with drawe the fyre and lat thame softly [strikeout] kele and
when thai er wele lewk than clens thame and wryng thame thorow a grete schete both
the water and the herbs intyll a clen fatt kastyng a way the draf of the herbes and whils
the water is yet lewk put it agayn in till the lede made clene agayne To two galons of this
water tak one of hony for the fynest Or to iij galons of this water for the second and
wheder it be the tone or the tother boyle thamm well to gyder ever scomyng tham with
a syff to it be done and after tak it owte and putt it into fattes thar to stand apyn iij days
and after put thare opan a potell of berme als brewers dose with new ayle fletyng it
when it neds iij or v. days and thane tune it up in to pypes or barells and kep it als wyne.
(f.109v)

British Library Sloane 73 f.95b contains a recipe that is cataloged as (Catalogue, 1908):

A receipt to make “potus merlinus”, mead or metheglyn; 15 cent. com: “Take out ye
rote of fenel p[ar]sely with the roote tansey, etc.” ends: “You schalt understonde that
ther ben but fewe men that kanne mike meth on the maner, for this is t
he man’r th’t was mad to Kyng Arthur, it hatte in Wallsch metheglyn. (p.855)

The initial phrase in Sloane 73 is almost identical to the three complete versions, with the
same ingredients in the same order. Additionally, the only known uses of tansey root in historical
mead recipes are by the recipes in this group (Angotti, unpublished). These factors together
almost certainly place this recipe in the same group.

The metheglin recipes in this group each use 36 or 37 herbs, roots, and flowers; the order
and identification of 28 is the same in all three. The core ratio of one part honey to two parts
herb-infused water is present in all recipes, and details of process for boiling, straining, and
cooling show significant correlation.

The three recipes also show divergences, although most appear to be ambiguities of
meaning rather than intentional change. Spelling variances allow for potential alternate
identifications for some herbs\(^\text{12}\). The portion(s) of plants used, whether root, herb, or root and
herb for several ingredients is grammatically unclear. The recipe in MS.MSL.136 adds licorice

\(^{12}\) e.g. Radisshe/radiche/radcole, wild sage/medwort/mede, hillwort/pulliol mountain.

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and 9 spices, there is no parallel in the other recipes. The recipe in Harley MS 2378 adds thyme in an addenda.

The metheglin recipe in MS.MSL.136 shows significant additions relative to the other two versions. This implies that neither of the other two versions was drawn from MS.MSL.136. The content of MS.MSL.136 adds to that of Add MS 14252, and does not omit any information. Compared to Add MS 2378 it adds the same information but omits the addenda about thyme. This suggests that MS.MSL.136 may have a direct lineage to Add MS 14252 but is less likely to be drawn from Add MS 2378. The text comparison indicates an unidentified common ancestor to all three recipes.

**Medicinal Drink**

The etymology of the word metheglin is Welsh, a combination of the words for doctor (meddyg) and drink/intoxicating liquor (llyn) (GPC online, 2014). The metheglin recipe from Harley 73 (15th c.) tells us it is Welsh.

Metheglin as a medicinal drink is well-represented in 14th-16th century English-language manuscripts, 14 total recipes are known named with varied spellings of “metheglin”. This is only slightly less frequent than recipes for braggot (ale with spices and honey, also considered a Welsh drink), and notably more frequent than any other style of mead (Angotti, unpublished).

16th century English texts on health reflect the recognition of the drink as a medicinal cure. Elyot (1541, p.36r) tells us in his *Castel of Helth*: “Metheglyn, whiche is moste used in wales, by reason of hotte herbes boyled with hony, is hotter than meade, and more comforteth a colde stomake, if it be perfectly made, and not new or very stale.” English-language recipes in 16th century manuscripts remain medical in context.

By the mid-17th century, metheglin became a commonly used name for mead recipes presented in recreational and cooking contexts. Metheglin recipes of this era may have only one
or two herbs or even none. Many or most of them included spices. Some 200 years after MS.MSL.136 was written, Sir Kenelm Digby’s seminal collection of mead recipes, first published in 1669, titles over 40% of the recipes as metheglins. In addition, a number of the recipes not called metheglins are, by ingredients and description, metheglins through their inclusion of multiple herbs. By this time the term metheglin had shifted to indicate a predominately recreational drink, perhaps with some medical implication, and not necessarily include a core herbal component. This matches the modern definition of metheglin as a mead with herbs and/or spices with no innate medicinal implication.

In contrast, the connection from 14th-15th century English-language metheglin recipes to their Welsh origin through Welsh language sources is not established. There are no known early Welsh-language recipes for meads with multiple herbs, or for honey-based drinks called metheglin. The etymology of Welsh 13th-15th century words related to metheglin do not appear to require a honey-based drink.

Figure 8: ‘Coloured printed map of Wales and Anglesley” Lord Burghley’s Atlas, 1579, British Library Royal 18 D. III, ff.98v-99r (credit British Library CC0)
A 2020 compilation of Welsh-language medical manuscripts of the late 14th and early 15th century includes varied medical recipes from ten texts as well as some miscellaneous recipes. These ten texts are compiled from the contents of four manuscripts, and total over 500 recipes, including many using honey. Only one recipe could potentially make a mead (Luft, 2020, recipe 10/45). Despite containing 10 herbs, this recipe is not called by any name typically used for mead in the contemporary Welsh. This compilation also consistently translates metheglin as “medicinal drink”. All of the recipes associated with this term do not specify honey, and either do not specify a substrate or specify wine/ale.

The importance of mead as a drink in Medieval Wales is clearly established. Medieval Welsh laws place the king’s mead maker as the 11th of 16 officers of the King’s household, or 19th of 24 officers of the court (Probert, 1823; Ancient laws, 1841). The mead maker is ranked above the cook. Y Gododdin, the epic medieval Welsh poem makes many references to mead and its significance in the warrior culture (Arnold, 1999). These speak to the importance of mead in early Wales, but do not provide details or shed light on the medicinal side of mead as represented by metheglin.

The lack of recipes resembling the English metheglin in available Welsh sources is puzzling and requires further investigation. The link of the drink to Wales appears certain, but currently lacks supporting evidence within the Welsh tradition. The definitions and implications of the various Welsh words for alcoholic drinks are complicated (and potentially confused in the case of metheglin by the surface similarity between meddyg – doctor and medd – mead). This is seen in 1609 when Butler writes in his The Feminine Monarchie Or a Treatise Concerning Bees: “Metheglen is meth compounded with herbs: so calleed quasi Meth e glen, meth of the vallie, because it is made in the vallies, where is abundance and variety of holsome herbes” (Ch.10).

**Handling and storage of herbs**

MS.MSL.136 tells us

| Gederyne of sedes shuld be when thei bene full ripe & and the moystnes be dryede someadele a way floures shuld be takyne thei be someade opyene or thai begynne to welow or fade yerdis shuld gedryde when thei be full of moystnes or thai begynne to schrynke Rotis shullen be gedyred when the leves fallen (f.37v) |

A number of the ingredients added to the metheglin are given specific gathering times in the sections of MS.MSL.136 where specific herbs are discussed. The diverse collection times for

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these herbs indicates that the metheglin could not be made with all fresh herbs at any time of year, therefore it seems likely that dried herbs were used for some or all of the additions. That no note is made of fresh versus dried herbs suggests fresh and dried herbs may have been considered equivalent in mead making (or mixing of fresh and dried unavoidable).

**Addition of Licorice and Spices**

Of the six 14th-15th century English language recipes for metheglin where the full text is available, the recipe from MS.MSL.136 is the only one that contains licorice and spices.

Until the mid-17th century, metheglin recipes with many herbs typically had no spices or only galangale (which is sometimes included with herbs and sometimes with spices in historical mead recipes). After the mid-17th century, the majority of metheglin recipes contain spices. Increasing the palatability of the final product is a possible reason for this addition.

It can be questioned whether the addition of licorice in MS.MSL.136 is intentional or accidental. The text of Harley MS 2378 uses “lycours” to describe the metheglin must, this wording could have been misunderstood as licorice and the amount and addition instructions elaborated by a scribe copying the recipe.

The amounts of both licorice (removed before fermentation) and the spices (left in the fermentation with no removal indicated) will potentially lead to extremely strong flavors.

**Egg as Hydrometer**

The last phrase in the MS.MSL.136 metheglin recipe instructs: “and in the begynnynge when thou puttist in hony in to the water / it is myghty enough if it ber an eye that thow may see a peny brede of the ey above the water.” This method measures the relative amount of honey (sugar) in the must by whether the density has increased enough to make an egg float.

A fresh hen’s egg has a specific gravity of approximately 1.065 (Paganelli, 1974), and thus when it floats in a solution the specific gravity of that solution is at least that. Because honey has a specific gravity of about 1.44, this happens when a solution has about one and three-quarters pounds of honey per gallon of total liquid, or enough sugar to ferment to a drink containing 89% alcohol. When an egg floats with some amount showing above the water, the solution is denser. The amount showing is historically measured relative to the diameter of common coins. Use of a fresh-laid egg is often specified, and is important as eggshells let in air over time, so an old egg is less dense than a fresh laid one.
The principal for creating a hydrometer was known in Roman times, but it is not clear this knowledge remained accessible during the middle ages. Modern hydrometers as a specific instrument date to the late 17th century.

Prior to the rediscovery of this recipe, the earliest known use of an egg to measure the density of a mead must was over 100 years later, in a French recipe for mead from 1576 (Estienne, Book II p.144r). This recipe indicates they take the knowledge that it is cooked by an egg that they throw in; which if it swims over it is a sign that it is cooked, if it goes to the bottom, it is not cooked\textsuperscript{13}. Two meheglin recipes in manuscripts of the late 16th century also mention the egg float test, these two appearances put this method in three of ten pre-17th century English meheglin recipes and also places the three among the first dozen appearances of the egg float test in meads across Europe. These two later meheglin recipes do not belong to the MS.MSL.136 meheglin recipe group. Appearances of the egg float test in mead recipes in print and manuscript form multiplied after the late 16th century, and became common in the later 17th and the 18th centuries.

The increased density of salt water is noted in Bartholomaeus Anglicus’ encyclopedic *De Proprietatibus Rerum* (c.1240); an early 15th century English translation states “for an ey fletith in salt water: & sinketh doun in fresch water” (Anglicus, 1st quarter 15th c., f.110v). The egg float test is also known to have been used in multiple disciplines to assay the specific gravity of a liquid solution. The test is used in soap making as detailed in the 1559 French version of *The Secrets of Alexis of Piedmont* (Ruscelli, 1559, Book II f.42r, f.44r)\textsuperscript{14}. The use of an egg to measure salt brine density for cooking/preserving is used in a 1539 translation of the agriculture

\textsuperscript{13} French “prennent la cognoissance de sa cuisson par un oeuf qu’ils jettent dedans, lequel s’il nage par dessus c’est signe qu’il est cuit, s’il va au fond n’est pas cuit.”

\textsuperscript{14} This text was first published in 1555 in Italian, quickly translated into French (1557) and English (1558), then into other languages. It was reprinted extensively.
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compilation Geoponika (Bassus, 1539, Book XX Ch. XL)\(^\text{15}\). Finally, it is used in 1521 in an edition of Petrus de Crescentis’ early 14th century agricultural text in the context of keeping chickens (Crescentis, 1521, Book IX Ch. LXXXVII). Additional investigation can be expected to add further detail to the history of the use of eggs as hydrometers.

**Fruited Mead**

Immediately after the recipe for metheglin in MS.MSL.136, there is a recipe for “clarey” (a spiced and sweetened wine used recreationally to aid digestion), which is followed by one for a fruited mead (a style called melomel in modern mead making). This recipe reads:

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An other gode drynke boile x galons of clere watir and a galon of honey iij howres and skymme it wele and kest in iiij galons of damysyns or of chires and boyle as longe as then put there to ij unces of powdird of rosemary and as moch powdyr off sawge and when itt is cold clene it and twne it in a barell opon a galon of good reede lyes that bene new and there in a small clout an unce of powdird of galyngalle and half an unce of powdird of canell and stop it fast that noon eyr go owto and lett it stand so x wekes o r xiij and than broch it iff thou wilt to. (f.22v)
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The characterization of this as a “gode drynke” without a specified medical use could imply that it is more recreational than medicinal. This implication is strengthened by the prevalence of historical mead recipes using fruits in culinary contexts, coupled with the infrequency of medical uses being associated with mead recipes using fruits and the lack of medical language in the recipe. Finally, the recreational function of the previous recipe for clarey does have a medical aspect but is more closely associated with feasting.

**Related Recipes**

This recipe has no evident connection to other historical mead recipes. It is the earliest known using either damsons (plums) or cherries. The next recipes using plums do not appear until the mid-17th century, almost 200 years later. The next recipe using cherries is a German one for Kirschwein, with a first known appearance in 1536 (Schaufelein, 1536, np). The kirschwein recipe adds cinnamon, cloves, and galingale, similar ingredients to the recipe in MS.MSL.136,

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\(^\text{15}\) This passage was translated by Dalby (2011) as “Into pure brine, which you have tested by floating an egg in it (if it sinks, the brine is not salty enough)”. Dalby suggests the use of an egg was added as conjecture to fill in an unreadable portion of a manuscript, but the date of this occurrence is unclear. A review of earlier manuscript versions of Geoponica may resolve this. If the egg is absent from previous versions, it still suggests that using an egg for such measurements was well enough known that the translator thought of it as a reasonable way to fill in the missing text.

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however Schauflein adds honey to cherry juice without boiling, compared to the serial boiling and addition of water in MS.MSL.136.

**The Form of the Fruit**

The recipe calls for three gallons of damsons or cherries. The form, whole, crushed, or juice, pitted or not, is not specified. An argument can be made for any of these.

- Whole fruit is potentially implied by the lack of instructions for preparation, but there are also no instructions for removal of pulp and stones. Whole fruit with no treatment is disadvantageous in brewing, it will not mix well (although the long boiling will break it down), and it must be separated from the drink before or after fermentation. Fruit stones can introduce unpleasant flavors, particularly in long boiling. And as long as the whole fruit is present it presents an increased risk of spoilage.

- Crushed or pitted can be argued to provide better mixing, but presents the same challenges as whole fruit.

- Juice can be argued by the measurement in gallons, usually a liquid measure. Juice is also more likely because the vast majority of historical mead recipes using fruit, where a form is specified, use juice. Use of juice is also implied by the lack of a straining step to remove solids. Finally, the use of juice simplifies brewing and reduces risks of spoilage and contamination from solid matter. Practicality argues to remove these risks.

It is most likely that fruit juice is the form of cherries or plums intended by this recipe. Crushed (possibly pitted) is also plausible with an implied straining step prior to fermentation. Fermentation with fruit solids is not only rare in historical recipes, but also presents a problem of solids removal from a finished (possible barreled) product, which presents significant contamination potential and likely loss of product.

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It is possible that the scribe missed some words when writing the recipe, the phrase “or of chires and boyle as longe as then put there to” is an awkward construction and could indicate a missing phrase detailing boiling time and dealing with fruit residue.

**Herbs and Spices**

The use of spices in a fruited mead is relatively uncommon historically, the use of herbs even more so. The herbs and spices in the recipe, however, are relatively common ones. It is worth noting that the specification of canell for cinnamon can typically be interpreted to mean the use of *Cinnamomum verum*, or Ceylon cinnamon, rather than the more common *Cinnamomum cassia*, which has a stronger and sharper flavor.

**Yeast Source and Barrel**

The yeast for fermentation of the must will be provided by the lees of red wine added before “twne it in a barell opon a galon of good reede lyes that bene new”.

The use of a barrel for mead fermentation is quite common historically. In many cases the barrels are specified to have previously contained a fermented liquor, usually wine. Not only does such a barrel provide flavor from oaking and residuals of the previous contents, but it also provides a source of live yeast that are suitable for fermentation of an alcoholic drink. These yeast cultures would be the natural yeasts from the vineyards, selected for wine production, in contrast to the local ale/bread yeasts of the other MS.MSL.136 recipes.

The volume of wine lees added to the recipe is notable. The amount used is more than 10% of the expected total volume of the fermentation and will add flavor from the wine in the lees as well as some color. The Tractatus metheglin recipe (Peregrinus, 14th c., f.20v) adds one part in four of ale lees, re-creation of the recipe results in a drink with significant malt character. Another early recipe uses about 1% brandy added to a plain mead, providing a detectable shift in flavor (de Serres, 1600 p.830).
Nature of the Meads

Determining the nature of the meads that can be expected to have been made from each of the MS.MSL.136 recipes requires not only interpretation of the meaning of the instructions as written and how those instructions would have been executed some 600 years ago, but also an understanding of how ingredients and equipment would have differed from those currently available and the functional effect of those differences. Some instructions are clear, others unclear or absent. In many cases multiple interpretations are plausible. Much of the ambiguity in the recipes would have been the same for a 15th century person making the recipes. The characterization of each drink below is based on the interpretations judged most likely based on current knowledge.

Further information on the character of these meads can be drawn from re-creating varied interpretations of these recipes. This experiment archaeology can be key in understanding all aspects of the production and use of the drinks as well as their character.

The three meads show a wide range of potential alcohol level from about 6% ABV to over 15% ABV. The meads will range from unflavored (except for the inherent flavor of the honey used and flavors added by yeast by-products) to heavily flavored with almost 50 herbs and spices. They can be expected to have very low to high residual sugar. The fermentation and aging times are in expected correlation to the amount of honey used. The hydromel is drunk after two days, the melomel after about 3 months, and the metheglin being expected to age as long as 7 years. The variation of all of these elements is well within the enormous variety of historical mead recipes and reflects the enormous potential diversity of mead as a drink.

**Hydromel**

The hydromel, with a 1:8 honey:water ratio, starts with about one and a third pounds of honey per gallon liquid (using honey at 12 pounds per gallon), which will rise slightly with water loss during boiling leading to an expected initial specific gravity in the range of 1.051-1.055, a potential alcohol content of 68%. The use of sourdough makes diversion of sugar into products other than alcohol more likely than with a pure brewing yeast culture, including production of

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side flavors during fermentation such as “wild” or “sour” taste. The specified 2-day fermentation period implies that it may have been drunk partially fermented, cloudy, and fizzy. As stated above, it is expected that this drink could be macerated with herbs to produce medicines relying on the properties of those herbs.

**Metheglin**

The ratio of honey to water in this recipe is 1:2 or 1:3 (an initial specific gravity of about 1.145 or 1.11) then boiled until the scum stops rising. The final note indicates this mixture should bear an egg with a penny’s breadth showing above the water when the honey is first added. The Portable Antiquities Scheme, indicates that the mean diameter of all medieval pennies in their database is 17.84 mm (British Museum, 20032021). The size of an individual coin could vary significantly, both from inconsistencies in manufacture and if it was clipped or otherwise damaged. Experiments conducted on two eggs suggested that an egg with 18 mm breadth showing represents a specific gravity of 1.101.11, almost exactly matching the expected specific gravity of the 1:3 mixture.

If we use liquid loss of about 15% per hour of boiling (Angotti, 2019, pp.3637), the final expected specific gravity will likely be 1.131.17. The higher end of this range can lead to difficulties with fermentation but is not out of question for a mead expected to last seven years, as stated in the recipe. Even at the lower end of the range, the resulting mead is likely to be both strong in alcohol and contain significant residual (unfermented) sugars.

The multiple herbs and spices added to the drink, are certain to give this mead a host of very strong flavors. Both the alcohol and residual sweetness will balance these strong flavors but it is difficult to imagine the flavor being pleasant to most palates. It should be noted that the medicinal nature of the drink probably made flavor a secondary consideration in its making.

**Fruit Mead**

The final sugar content of the mead must will be strongly affected by the extent of liquid loss during the two extended boiling periods. The initial 11 gallons of honey:water mixture is boiled for 3 hours. Using the same liquid loss estimate as for the metheglin, it is estimated that after 3 hours, under seven gallons of the original 11 gallons will remain with a specific gravity of about 1.065. The cherry or damson juice that is added will have an approximate 1.051.06 specific gravity. Interestingly, the four gallons of fruit juice that is added will bring the volume almost to the same 11 gallon starting volume before the second boiling period. The resulting mix
after that second boiling will have a specific gravity of about 1.0951.10, and a volume of about 7 gallons.

Yeast and flavor are added to the mixture through the wine lees. The use of a barrel will potentially add flavor from the wood, this character may be significant if the barrel is relatively new or recently contained a liquid that either had strong flavor or was present in the barrel for some time. The use and re-use of barrels quickly exhausts the flavor donated by the wood, modern usage suggests that within three to five years, or three to five fillings, a barrel will not add significantly to the flavor of the liquid inside (Cole, 2018).

The drink made from this recipe will be relatively strongly flavored, in part because of the spices and herbs added. The fruit presence may be minimized both by the amount added which is about half of the final liquid volume, and by the presence of other flavors.

Summary

Wellcome MS.MSL.136 provides a window into Medieval English mead making practices. The analysis of the recipes and comparison to other recipes, establishes 15th century English mead making in a larger world that extends as much as a millennia into the past, and across the European continent. Each of the recipes in this manuscript has notably different historical background and is carried through into later periods in different ways.

Additional insight into the likely properties of the three meads can be gained by using experimental archaeology techniques to try varying theories about how the recipes were made. These experiments may not lead to definite conclusions, as the breadth of possibilities for making mead leave a great deal of margin for producing palatable drinks.
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