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Did the Laodiceans Drink Lukewarm Water?
A Hydrological Inquiry into the Temperature Metaphor of Revelation 3:15–16

Laodikeialılar Ilık Su mu İçtiler?
Vahiy 3:15–16'daki Sıcaklık Metaforuna İlişkin Hidrolojik Bir Araştırma

Mark WILSON*

Abstract

Laodicea is the last of the Seven Churches mentioned in the book of Revelation chapters 1–3. This article examines the interpretative issues related to the well-known temperature metaphor found in chapter 3:15–16. The mention of "hot, cold, and lukewarm" has been related to the city's hydrological situation. First discussed are the early travelers to the site and what they wrote about its water system. In the twentieth century various interpretations arose that suggested its water source was inferior to others in the Lycus valley such as at Hierapolis and Colossae. The excavation of Laodicea beginning in 2003 has revealed much new information about the city's hydrological situation. The proconsul's edict about water found at the South Nymphaeum gives further insight into the city's hydrology. Unfortunately, none of this is being reflected in contemporary discussions of the temperature metaphor in Revelation. After reviewing this new data, the article concludes that the interpretation that the temperature metaphor cannot be related to Laodicea's hydrological situation.

Key Words: *Seven Churches, Laodicea, temperature metaphor, water system, hydrology.*

Öz

Laodikeia, Vahiy Kitabı'nın 1-3. bölümlerinde bahsedilen Yedi Kilise'nin sonuncusudur. Bu makale, 3:15-16. bölümlerde bulunan meşhur "sıcaklık metaforu"yla ilgili yorum sorunlarını incelemektedir. "Sıcak, soğuk ve ılık" tabirlerinin kullanılması, şehrin hidrolojik durumuyla ilişkilendirilmiştir. İlk olarak, bölgeye giden ilk gezginler ve onların su sistemi hakkında yazdıkları ele alınmıştır. Yirminci yüzyılda, kentin su kaynağının Hierapolis ve Kolossai gibi Lykos Vadisi'ndeki diğer su kaynaklarına göre daha düşük olduğunu öne süren çeşitli yorumlar ortaya çıkmıştır. Laodikeia'da 2003 yılında başlayan kazılar, kentin hidrolojik durumu hakkında pek çok yeni bilgiyi ortaya çıkarmıştır. Prokonsül'ün, Güney Nymphaeum'da bulunan suyla ilgili fermanı, şehrin hidrolojisi hakkında daha fazla bilgi vermektedir. Ne yazık ki bunların hiçbiri Vahiy'deki sıcaklık metaforuyla ilgili çağdaş tartışmalara yansıtılmamaktadır. Bu yeni veriler incelendikten sonra makale, sıcaklık metaforunun Laodikeia'nın hidrolojik durumuyla ilişkilendirilemeyeceği sonucuna varmaktadır.

Anahtar Kelimeler: *Yedi Kilise, Laodikeia, sıcaklık metaforu, su sistemi, hidroloji.*

* Prof. Dr., Asia Minor Research Center, Antalya; University of South Africa; Stellenbosch University, RSA
0000-0002-8536-2718 | markwilson@sevenchurches.org

Introduction

Laodicea is named as the last of the Seven Churches mentioned in Revelation chapters 1–3.[1] This apocalyptic work is the last book in the Christian canon as well as the final book of the New Testament. The Seven Churches are well known not only because of their spiritual significance but are also recognized today as important archaeological and touristic sites seen by thousands of visitors each year. Particularly familiar is Jesus' admonition to the Laodiceans: "I know your deeds; you are neither cold nor hot. I wish you were either cold (ψυχρὸς) or hot (ζεστός). Because you are lukewarm (χλιαρὸς) and neither hot nor cold, I am about to spew you out of my mouth" (Rev 3:15–16, author's trans.). This article will discuss the temperature metaphor beginning first with its reception history. It will then examine how material culture was used to interpret it through the presumed hydrological situation of Laodicea. Since 2003 a Turkish archaeological team under the direction of Prof. Dr. Celal Şimşek has been conducting archaeological excavations at the site. His investigations have included its water system. Because little of the published data has been translated from Turkish, this article will summarize these findings in English. The evidence from this archaeological data will then be compared to claims made about Laodicea's water system in various commentaries, monographs, and articles about Revelation 3:15–16.

Early Interpretations of the Temperature Metaphor

Laodicea's water system has been known about since the earliest Western travelers visited the site. When Rycaut came in 1678, he was guided to Laodicea by following the city's aqueduct from the south[2]. In 1725 Chandler stated: "It has often been remarked, that the waters of Laodicea, though drinkable, had a petrifying quality; and at the east end of this ruin (Roman bath) is a mass of incrustation formed by the current, which was conveyed to it in earthen pipes"[3]. A century later Arundell cited Chandler's observation that the Meander countryside was full of inflammable matter and abounding in hot springs bubbling to the surface that had similarly formed the bowels of Laodicea. From such burning Arundell concludes that "to a country such as this how awfully appropriate is the message of the Apocalypse"[4]. He then cites Revelation 3:15-16. When Brewer visited the site in the 1830s, he noted that among Laodicea's numerous remains, "one of the most striking is that of an aqueduct…running north and south in a small plain"[5] (Fig. 1). He also commented on the hot springs in Hierapolis but never linked the two water sources[6].

Hamilton visited in 1835 and mentioned seeing not only the aqueduct and the pipes but the south water tower[7]. Bellew's commentary accompanying some of Allom's gravures on the Seven Churches is most descriptive. Noting the water system with its aqueduct on arches and descending pipes, he observed: "It is evident that hydrostatics were understood at Laodicea". He also added that these pipes "are

[1] The Greek name Λαοδίκεια is spelled various ways in English. For this article the spelling used in all English translations of the New Testament is followed.
[2] Rycaut 1679, 60. A review of these travelers is suggestive, not inclusive.
[3] Chandler 1725, 226-227.
[4] Arundell 1828, 90, who quotes Chandler 1825, 286-287.
[5] Barber 1851, 243. This aqueduct is depicted in his view of Laodicea on page 240. Barber's volume is compiled from the journals of J. Brewer.
[6] Barber 1851, 259; Miller 1897, 287-291, does so similarly.
[7] Hamilton 1842, 515-516.

choked with incrustations of calcareous matter, proving to us that the water which fed Laodicea was as strongly impregnated with lime as we find it at Hierapolis”[8].

Fig. 1. Stylized Etching of the Aqueduct, 1832[9]

Beckwith in his commentary viewed lukewarmness as the principal figure in the temperature metaphor: “The strong figure of tepid water causing nausea is used to open their eyes to the Lord’s abhorrence of the present attitude”[10]. Building on the fact that tepid water provokes nausea, Swete writes: “There is probably an allusion to the hot springs of Hierapolis, which in their way over the plateau become lukewarm, and in this condition discharge themselves over the cliff right opposite to Laodicea”[11]. Ramsay noted that Laodicea’s water supply was carried via an underground aqueduct from springs about six miles south of the city. His primary concern was that the system was vulnerable to enemy attack and that this “must have prevented the people from ever feeling secure when threatened with attack”[12]. Despite Ramsay’s predilection for connecting local features to the text of Revelation, he never even mentioned the temperature metaphor in his discussion of Laodicea’s spiritual condition. Rudwick and Green noted that for this “curiously enough, Ramsay offers no interpretation”[13], while Wood likewise observed that “one is only surprised that so great a traveller as Sir William Ramsay should apparently have

[8] Alllom – Walsh 2006, 200. Bellew’s text was among the descriptions that accompanied seven additional Allom gravures of the Seven Churches and appeared in the *Art Journal* in 1862. These were published in my updated edition of *Constantinople and the Scenery of the Seven Churches of Asia Minor*.
[9] Etching by Thomas Knox in MacFarlane 1832, 50.
[10] Beckwith 1919, 490.
[11] Swete 1911, 60.
[12] Ramsay 1904, 415.
[13] Rudwick – Green 1957-58, 176.

missed the significance of the double row of stone pipes leading across the hill towards the city"[14]. Perhaps this great archaeologist never missed anything and realized that the water system was not a local reference for interpreting the temperature metaphor. In summary, early travelers and commentators failed to make any explicit connection between the temperature metaphor and Laodicea's hydrological situation.

Modern Interpretations of Laodicea's Hydrological Situation

Rudwick and Green were the first modern commentators to connect the metaphor of hot, cold, and lukewarm to Laodicea's water system. Their hypothesis was based on some observations made during a visit to Laodicea in 1957. Seeking to apply Ramsay's approach of identifying local references, their autopsy of Laodicea suggested that its water system shed light on interpreting the temperature metaphor. They observed that "Laodicea, in the absence of any permanent source of more normal water in the area, was obliged to procure its water from these hot springs. If this was the case, the water would have cooled slowly in stone pipes, and even after having flowed several miles, would still be warm when it reached the city". They further noted that "the 'lukewarmness' of the Laodicean Church is an allusion to the unusual quality of the city's water supply". They next commented on the healing properties of the thermal spring water in Hierapolis and the refreshing cool water of Colossae. Based on these observations, they concluded: "Laodicea would have been notorious as a city which, for all its prosperity, could provide neither the refreshment of cold water for the weary, as, for example, its neighbour Colossae could, nor the healing properties of hot water for the sick, as its neighbour Hierapolis could"[15]. Another visitor named Wood subsequently made three visits to Laodicea in 1958, 1959, and 1961 and concluded about Rudwick and Green: "Their thesis is convincing"[16].

Subsequent interpreters on the message to Laodicea have reflected this interpretation in almost every discussion of the temperature metaphor since. Significant among these was the extended discussion of Hemer who concludes about Laodicea that "the affluent society was far from the sources of its life-giving water, and when by its own resources it had sought to remedy the deficiency, the resulting supply was bad, both tepid and emetic"[17]. Porter, writing soon after, purported to address the question anew. However, he largely affirmed Hemer's perspective: "Since the Laodiceans had no natural springs for fresh water or at least not enough for their growing population, they likely were forced to pipe in whatever water they could. And this water was probably transported to them lukewarm from the outset". Porter, nevertheless, did acknowledge that his reconstruction is speculative since "records are unavailable for the rate of water flow through the aqueduct; the times, seasons, or years of the aqueduct's use; or records of water rights (a place near modern Denizli is still only a speculative source)". He concluded his brief discussion, stating: "The fact that the Laodiceans went to the trouble and expense of building an aqueduct to bring in water of inferior quality on account of its unusable temperature probably attests to their being in a worse position than surrounding cities in at least this one respect"[18].

[14] Wood 1962, 263; Hemer 1986, 186, similarly calls this a "remarkable omission".
[15] Rudwick – Green 1957-58, 177.
[16] Wood 1962, 268.
[17] Hemer 1986, 191, with discussion on pages 186-191.
[18] Porter 1987, 147, 148.

More recent expositors continue this line of interpretation. Yamauchi was one of the first biblical scholars to attempt to bring "light from archaeology" to bear on interpreting the Seven Churches. He observed three things about Laodicea: 1) it had no springs, 2) the Lycus River was not dependable, and 3) the water feeding the aqueducts came from hot springs[19]. While Yamauchi's discussion on other sites is useful, here it shows how advancements in archaeological knowledge date his comments about Laodicea's hydrological situation. Worth, after discussing how Laodicea's water arrived lukewarm in the city, concluded: "Hot water in Hierapolis served a useful purpose, cold water at Colossae served a useful purpose, but lukewarm water is completely useless"[20]. Weima explained as well: 'Since one of Laodicea's main water supplies was a hot mineral spring some five miles away, the water would cool as it traveled along the aqueduct and would arrive in the city no longer hot but lukewarm"[21]. Graves attempted a more in-depth look of Laodicea's hydrological situation. Nevertheless, he wrote that it "had a serious disadvantage: the city lacked an adequate fresh water supply, with the Lycus river drying up in the summer". He then correctly mentioned that its potable water came from a source south of the city near Denizli, but nevertheless implies that it was deficient because "this water contained a high percentage of minerals"[22].

Among this unanimous chorus of interpreters, a dissenting voice was raised by Koester who criticized this *communis opinio* for interpreting the temperature metaphor. He noted that aqueducts were used in or around all of the cities in Revelation so Laodicea's water supply was like these. If Laodicea's water was lukewarm, the same would have been true of the other Seven Churches[23]. Calling the prevailing interpretation "untenable", Koester concluded his discussion, saying, "All this attests to Revelation's imagery not being connected to the quality of local water supplies" [24]. Koester's observations about Laodicea's hydrological situation were prescient. Citing sources on the hydrological situation of other Asian cities, now all dated, Koester could not include any specific data on Laodicea because excavations there had not yet begun.

In summary, with the proliferation of commentaries and monographs on Revelation beginning in the late 1990s, similar discussions of this metaphor are found in each. Except for Koester, they usually summarize previous publications with little new material introduced. And all, including my own writings on Revelation, have failed to discuss some results of the archaeological activity that began in Laodicea in 2004[25]. Those findings regarding Laodicea's hydrological situation will be summarized next.

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[19] Yamauchi 1980, 141.
[20] Worth 1999, 216.
[21] Weima, 2021, 239.
[22] Graves 2017, 442-443. While he is aware of the work of Celal Şimşek and his excavation team, he fails to provide a more nuanced discussion of Laodicea's water system.
[23] Koester 2003, 411.
[24] Koester 2015, 337. He offered an alternative interpretation to that of the water system. In the context of a banquet a host might serve diners either hot or cold water or wine to drink. A strainer would be used to chill wine with snow and a metal water heater called a *miliarion* to heat the water. Such water heaters were usually found in bathhouses and not in a triclinium. This option still does not seem to capture the right interpretation; see Koester 2015, 333-334.
[25] For example, I wrote over two decades ago about the temperature metaphor: "This statement probably refers to the city's water supply"; see Wilson 2002, 34. See also Wilson 2018, 1895; Wilson 2020, 248-249.

Laodicea's Hydrological Situation

The inaccurate speculations of earlier commentators on Revelation are understandable because Laodicea remained unexcavated through the twentieth century. However, in 2003 the archaeology department of Pamukkale University in nearby Denizli started the first comprehensive excavations at Laodicea under the direction of Prof. Dr. Celal Şimşek. Since that time numerous articles and monographs documenting their finds have been published, some on the city's water system. Therefore, accurate information regarding its hydrological situation is now available, albeit mostly in Turkish. This data allows us to evaluate previous hypotheses and to lay a scientific foundation for ongoing discussion about Laodicea's water system[26].

Beginning in the Hellenistic period, Başpınar ("Springhead") became the main source of Laodicea's water (Fig. 2). Here underground springs beneath Mount Salbakos (modern Babadağ) were collected in a large reservoir.[27] From an elevation of 443 meters, water flowed 7.82 kilometers to the city's south distribution terminal.

Fig. 2. Başpınar looking toward Laodicea (highlighted) and Pamukkale/Hierapolis, courtesy of the author.

[26] Laodicea's water system was first published in a Turkish article with English summary by Şimşek – Büyükkolancı 2006a; for the German version see Şimşek – Büyükkolancı 2006b. This was developed in a section called "Kentin Su Sistemi" (City's Water System) in Şimşek 2007, 73-80. An updated edition was published in 2013 with the unchanged text on the water system on pages 63-70. However, four new illustrations were added: figs. 54, 57, 58, 61.

[27] Başpınar is no longer visible near the bakery Çıtır Fırın amidst the modern development in the Servergazi neighborhood of the Merkezefendi district of Denizli. The basin for water collection is located within the military area to the north; see Şimşek 2017, 8.

In the Roman period a second source was added—the Kara Hüseyin Pınarı (spring). Both lines used two thick terracotta pipes to bring water toward the city (Fig. 3)[28]. The two lines joined 3 kilometers south of Laodicea (Fig. 4)[29].

Fig. 3. Terracotta Pipes, courtesy of the Laodicea Excavation

To cross a ravine, an aqueduct with an open channel atop was constructed. The water then entered a depressurization and resting pool standing at 316 meters above sea level (asl). Here a double line of travertine blocks bored with terracotta pipes carried water across a valley descending to 261 meters asl by using a siphon system some 800 meters long (Fig. 5). Two rows of bored blocks, each measuring .75-.90 meters, are still visible running downhill on the west side of Eskihisar. Noticeable inside these pipes as well as those on the water terminal is the layer of calcareous limestone, which is typical of water in Asia Minor. Pipes that became calcified were either replaced or bypassed to facilitate a better flow.

[28] Şimşek 2013, 62, Res. 51.
[29] Şimşek 2006a, 95, Har. 1.

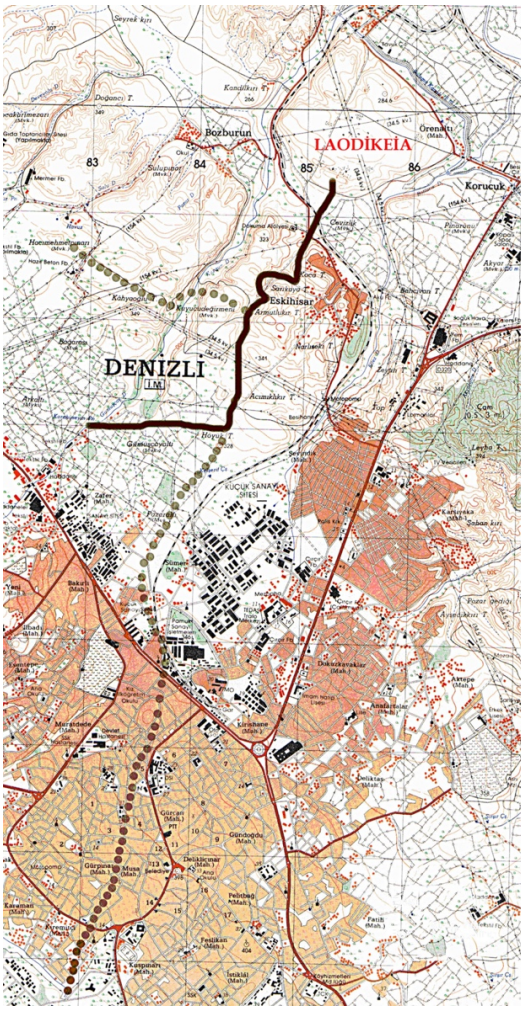

Fig. 4. Map of Laodicea's water system, courtesy of the Laodicea Excavation.

Fig. 5. Travertine blocks of siphon system to Terminal 1, courtesy of the author.

The siphon ended at Terminal 1 standing at 278 meters asl (Fig. 6). Water reaching Terminal 1, approximately 7 meters tall, was initially distributed to the stadium baths and nymphaeum, which overlooked the in-ground stadium below. Water from Terminal 1 was then sent to Terminal 2, which was 428 meters north and set at 291 meters asl. This terminal, whose foundation is still visible near the excavation house, distributed water to the later Caracalla and Septimius Severus nymphaea as well as to three nearby bathhouses. Terracotta pipes carrying this water are still visible on the eastern edge of the north agora.

Fig. 6. South Terminal 1, courtesy of the author.

But what about the potability of this water? Regarding Greco-Roman water systems generally Passchier and Sürmelihindi have written: “Aqueduct sources were selected to have year-round large quantities of good, clear water, and these usually happen to be carbonate rich springs; cave systems in limestone give rise to very large karst springs, which have clean water of constant composition year round”[30]. The authors note that such springs supplied the well-known aqueducts at Pont de Garde in France as well at Aspendos in Turkey.

That the water of Laodicea was of high quality is sustained by a long inscription regarding the safeguarding of the aqueduct from illegal tapping (Fig. 7). Found in excavations in 2015, the edict was issued by the proconsul of Asia, Cornelius Tacitus, and Saenius Sabinus the legate. Dating to 114/15 CE, it is now incorporated into the wall of the restored South Nymphaeum on Stadium Street. The inscription provides some significant information about Laodicea’s hydrological situation. It begins by noting that the system of this most splendid city brought “plentiful water from very abundant sources fulfilling the need of the city, both the ones from royal grant, and all the other from the most high antiquity, for saving (delivering?) need (of the city)”[31]. These sources were probably the springs south of the city in public areas[32]. By using

[30] Passchief – Sürmelihindi 2019, 513.
[31] Guizzi – Nocita 2022, 7, for the Greek text with translation on page 9.
[32] Guizzi 2019, 153, uses the Spanish word “demanial” to describe their location which in English means, “in the public domain”.

the particular language, ἄφθονον ὕδωρ …δαψιλεστάτων πηγῶν[33], Guizzi and Nocita comment: "The Roman magistrate points to the perennial abundance of water in Laodikeia and, above all, to the quality of water springs, confirmed by the local authorities as well as the members of imperial dynasties"[34]. The royal grants refer to the Hellenistic kingdoms who ruled before the Romans – first to the Seleucids who founded the city in the first half of the third century CE and then to the Attalids. Thus, both the supply and quality of Laodicea's water was guaranteed from "most high antiquity". Guizzi and Nocita continue: "It is widely known that safety and preservation of water sources elicited good interest from Greek legislators, because of the strict connection between the qualities of the springs and the terrains in which they were located"[35]. The discovery and publication of this inscription further dispels incorrect speculation that Laodicea's water system in the latter half of the first century CE was insufficient or deleterious.

Fig. 7. Proconsul's Edict Safeguarding Laodicea's Water System, courtesy of Celal Şimşek

The Hydrological Situation of Hierapolis and Colossae

Because Hierapolis and Colossae are often included in discussions of the temperature metaphor, it is appropriate to summarize briefly their hydrological situation. Excavations and surveys at these sites have similarly clarified water usage

[33] Strabo (13.4.14) notes that the supply of natural water in Hierapolis was also abundant (ἄφθονον). Similar language is found in two biblical texts: 4 Maccabees 3:10, ἀφθόνους ἔχων πηγάς, "plentiful springs", and Wisdom 11:7, δαψιλὲς ὕδωρ, "abundant water" (NRSVUE trans.).
[34] Guizzi – Nocita 2022, 10.
[35] Guizzi – Nocita 2022, 10-11.

in these cities. Visitors to the Lycus valley even today soon notice the white calcareous cliffs that rise to the north at Pamukkale ("cotton castle"). This natural wonder, now a UNESCO World Heritage site, results geologically from the thermal water that has passed over the hillside for millennia. Ancient Hierapolis is situated just above these travertines. The close geographical situation of the three Lycus cities, which later facilitated spiritual fellowship as well (Colossians 4:13), makes Swete's comment likely: "The allusion [e.g., the temperature metaphor] is the more apposite, since the letter for Laodicea was practically addressed to the other Churches of the Lycus valley, to the Church of Hierapolis as well as to Laodicea and Colossae"[36].

Although excavations began at Hierapolis in the 1960s, its water system has only recently been detailed at length by Scardozzo. He writes, "The thermal springs inside the urban area are not suitable for drinking, being characterized by high concentrations of dissolved salts"[37]. Instead Hierapolis's freshwater was supplied by three lines using an aqueduct system similar to that of Laodicea. These lines ran from springs 6.2 to 13.5 kilometers north, northeast, and east of the city whose elevation was 1065 to 1085 masl. Medium-sized terracotta pipes brought water from the northeastern and eastern aqueducts into the Castellum Aquae where water was stored and distributed to fountains and baths in the city. This castellum is still visible above the theater. Like the system in Laodicea, its pipes show evidence of incrustation of calcium carbonate, something common to the water systems in western Asia Minor[38].

The system at Colossae, where survey work began in 2021, was similar. One source was the gushing spring called Pinarbaşı ("Springhead") and today a popular recreation spot to cool off in the summer heat. Only 3.8 kilometers south of Colossae at the foot of Mount Cadmus (Honaz Dağı), the water was channeled through terracotta pipes to minimize evaporation and contamination. Since its route runs through modern agricultural land, few blocks of the system remain. Unlike Laodicea, a siphon system was unnecessary because of the level descending terrain. The Cadmus River (Aksu), a branch of the Lycus, flowed through the city. Calcified channels situated between the north bank and the necropolis indicate that its water was used to power mills and stone-cutting equipment hydraulically. The operational method suggests that it dates from the Roman period[39].

An inscription found near modern Honaz in 2005 honors Korumbos for repairing at his own expense the baths in Colossae, probably damaged in the earthquake of 60 CE that also devastated Laodicea. Cadwallader writes: "the evidence does confirm that the management of water delivery, from a spring or one of the streams that run from Mt Cadmus, was crucial to the functioning of the city baths and of the city. Korumbos apparently directed his attention to this part of the hydrological infrastructure (not just the baths themselves), in what may have been a new development in the city"[40]. Again, as Koester rightly observed, the hydrological situation of the three cities in the Lycus valley was little different from other cities in Asia such as Ephesus, Smyrna, and Pergamum[41]. Thus, recent archaeological

[36] Swete 1911, 61.
[37] Scardozzi 2020, 89.
[38] This description is summarized from Scardozzi 2020, 89-103. The routes of the water system are mapped on page 90, fig. 54. Calcareous deposits in the northeastern aqueduct are shown on page 99, fig. 66
[39] Cadwallader 2015, 142. The buildup of calcification in pipes and channels is shown particularly in plates 7.14-16. The suggested dating comes from Barış Yener, the archaeologist working at Colossae (personal conversation 29/08/2022).
[40] Cadwallader 2012, 176.
[41] Koester 2003, 411. Recent discussions of the water systems at these cities are Ephesus: Wiplinger et al. 2019a, Wiplinger 2019b; Smyrna: Ersoy – Alatepeleri 2016; Pergamum: Fahlbusch 2014.

excavations and surveys have validated this conclusion. Each city used a system that could include terracotta pipes, aqueducts, and siphons to bring freshwater for drinking, cleaning, and aesthetic embellishment.

Further Speculations on Laodicea's Hydrological Situation

Now that the scientific situation related to Laodicea's water is known, several further comments must be made regarding additional speculations. One involves the presence of calcium carbonate in the water. This can be observed in the pipes of the siphon system as well as in the terracotta pipes on the south water terminal that are clogged with such calcium deposits, usually called calcareous sinter. However, many water sources in Turkey contain calcium carbonate so similar calcareous-lined pipes can be seen in Perga, Ephesus, Hierapolis, et al. In fact, "It is even possible that sources with carbonate enriched water were preferentially used for masonry aqueducts because minor depositions of carbonate on the aqueduct wall and floor can heal cracks, and avoid dissolution of the waterproof opus signinum into the aqueduct water"[42]. Therefore, water with calcium carbonate should not be considered impure or of inferior quality but rather preferred in antiquity.

Laodicea's springs, often erroneously called "hot", supplied water of varying temperatures. Of course, this situation would be the same in every Greco-Roman city with a spring-fed aqueduct system. For water in such a system is not static in its chemical composition and temperature. As Passchief and Sürmelihindi note: "The spring may have a variable debit, temperature and composition over the course of one year and even if the spring water does not change much, water in the aqueduct is gradually warmed or cooled during its descent in contact with the walls of the aqueduct, and gradually loses carbonate that is deposited[43]. The external temperature would similarly influence the temperature of the water arriving in the city. In the winter, temperatures in the Lycus valley can drop below freezing to -10 centigrade[44]; in the summer, temperatures can reach 44 centrigrade. The result is that the water's temperature and composition varied throughout the year.

Conclusion

Our discussion, informed by recent archaeological activity, has demonstrated what was *not* regarding Laodicea's hydrological situation. A review of these *nots* reveals eight interpretative conclusions that have been offered. Again, a review of these is suggestive and not comprehensive.

1. Hot water from the springs at Hierapolis became lukewarm as it passed over the white travertine cliffs[45].
2. Water arriving by aqueduct from Hierapolis was either lukewarm[46] or had such a medicinal taste that the Laodiceans wanted to spit it out[47].

[42] Passchief – Sürmelihindi 2019, 513. Examples in Ephesus can be seen in the twenty-one figures that illustrate the article.
[43] Passchief and Sürmelihindi 2019, 513.
[44] Note that the water inscription mentions the need to heat the pipes on occasion to prevent the water from freezing; see Guizzi 2019, 159.
[45] Blaiklock 1951, 77-78.
[46] Ford 1975, 418-419, suggested that because Laodicea had no natural water supply, water was "piped from the hot springs of Hierapolis down a cliff through the Lycus". It is now known that a lake dating to the Roman period was situated in the Lycus valley between Laodicea and Hierapolis; see Scardozzi 2020, 24-25, 115-116, and the map on page 112, fig. 80.
[47] Blount 2009, 82.

3. The thermal water of Hierapolis had positive medicinal properties for the sick, something Laodicea's water did not possess[48].
4. A contrast is drawn between the hot, healing waters of Hierapolis and the cold, refreshing pure water of Colossae[49].
5. Since Laodicea lacked natural springs and the water from its nearby rivers was not potable, the city had to bring drinking water from hot mineral springs to the south[50].
6. The hot spring water would become lukewarm as it flowed to Laodicea[51], thus tasting tepid and causing nausea inducing regurgitation[52].
7. The presence of calcium carbonate in the pipes testifies not only to the impure "badness" of the water but also that it was not cold[53].
8. Laodicea was totally dependent on an external water supply, unlike its neighboring cities[54].

These erroneous speculations of previous interpreters who discuss the temperature metaphor should no longer be repeated. This article has demonstrated that none are accurate either archaeologically or geologically, so they should no longer be promulgated in sermons, articles, and commentaries discussing Laodicea's hydrological situation. The use of material culture remains important for interpreting ancient texts like the New Testament. However, current archaeological data must be taken into account for the sake of accuracy and plausibility in such discussions.

[48] Rudwick and Green 1957-58, 177.
[49] Mounce 1957, 125-126.
[50] Weima 2021, 262. Despite a title that might suggest an interpretation of the temperature metaphor, "Laodicea's 'Lukewarm' Legacy", Fairchild 2017 does not discuss its hydrological situation at all.
[51] Hemer 1986, 188. Rudwick and Green 1957-58, 177, suggest that "the 'lukewarmness' of the Laodicean Church is an allusion to the unusual quality of the city's water supply". Their modern illustration of villagers in Eçirli (Pamukkale) waiting for lukewarm water to cool before drinking is corrected by Wood, who mentions the presence of a fountain that villagers used for cool, potable water. He also corrects their claim that there were no streams flowing throughout the year near Laodicea. These correctives are instructive showing that even personal autopsy used in interpretation may be incorrect and require modification.
[52] Mounce 1977, 125 n. 36; cf. Beale 1999, 303.
[53] Hemer 189, 190. Paul 2013, 163, observes that when this lukewarm spring water came into the city, it was "full of calcium deposits – enough to make you want to throw up if you drank it".
[54] Meinardus 1979, 128. He further notes: "Using the metaphor of water, St. John reminds the Laodiceans that there was no compromise between absolute loyalty to Christ and participation in the imperial cults". How Meinardus makes the leap between water and the imperial cult is left to the interpreter's imagination.

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