



Israel Exploration Journal

VOLUME 72 • NUMBER 2
JERUSALEM, ISRAEL • 2022

ISRAEL EXPLORATION JOURNAL

The *Israel Exploration Journal (IEJ)* is the peer-reviewed journal of the Israel Exploration Society, founded in 1913 as a scholarly society dedicated to the promotion of historical, geographical, and archaeological research concerning the Land of Israel. The journal, appearing since 1950, is published biannually in cooperation with the Institute of Archaeology of the Hebrew University of Jerusalem.

**The *Israel Exploration Journal* is published with the assistance of
Ethan Grossman, Washington DC**

Founders

A. Reifenberg, D. Amiran

Former Editors

Michael Avi-Yonah, Dan Barag, Jonas C. Greenfield, Baruch A. Levine,
Amihai Mazar, Miriam Tadmor

Editorial Board

Shmuel Ahituv, Aren M. Maeir, and Zeev Weiss, *Editors*
Nava Panitz-Cohen, *Executive Editor*

Editorial Advisory Board

Gideon Avni, Mordechai Cogan, Avner Ecker, Israel Eph'al, Leore Grosman,
Amihai Mazar, Ronny Reich, Myriam Rosen-Ayalon, Izhaq Shai, Oren Tal

IEJ is available online on JSTOR

Email: iej.editors@gmail.com

Website and guidelines: <https://www.israelexplorationsociety.com/israel-exploration-journal>

Copyright © 2022 Israel Exploration Society
ISSN 0021-2059

The Editors are not responsible for opinions expressed by the contributors

CONTENTS

- 137 JOSEPH (YOSEF) AVIRAM 1915–2022, In Memoriam
- 140 IANIR MILEVSKI, DMITRY YEGOROV, SVETLANA TALIS, YOSSI NAGAR, ELISABETTA BOARETTO, LIORA KOLSKA HORWITZ AND PATRICIA SMITH: The Iron Age Cemetery of Tel Erani, between the Mediterranean Coastal Plain and the Shephelah
- 169 MORDECHAI COGAN: Binding up Samaria's Wounds: A Critical Assessment of New Assyriological Studies on the Fall of Samaria and Its Aftermath
- 189 YULIA USTINOVA, PABLO BETZER AND DANIEL VARGA: An Inscribed Sling Bullet from Iamnia (Yavneh)
- 204 UZI LEIBNER AND YAIR AMITZUR: A Lavish, Roman-Period Burial Cave in Tiberias
- 219 MOSHE FISCHER, MATTHEW J. ADAMS, NEER LECT BEN AMI AND YOTAM TEPPER: A Fragmentary Sculpture of Victoria from the Legionary Base at Legio
- 236 SHULAMIT MILLER, ZEEV LEWY, NITZAN AMITAI-PREISS AND ANNA IAMIM: A *Belemnitella mucronata* Fossil from Early Islamic Tiberias: New Evidence of Euro-Asian Connections
- 254 *Book Review*: Porath, Yosef, *The Synagogue at En-Gedi* (Qedem 64), The Hebrew University of Jerusalem, 2021 — JODI MAGNESS
- 260 *Obituary*: Professor Moshe Fischer — OREN TAL AND ITAMAR TAXEL

A Belemnitella mucronata Fossil from Early Islamic Tiberias: New Evidence of Euro-Asian Connections

SHULAMIT MILLER¹

ZEEV LEWY²

NITZAN AMITAI-PREISS³

ANNA IAMIM⁴

ABSTRACT: A fossil identified as *Belemnitella mucronata* was discovered in excavations conducted by Y. Hirschfeld in Tiberias. The fossil originated from Upper Cretaceous chalk formations in northwestern Europe and was found inscribed with a name in *Kufic* Arabic script. This study analyzes the fossil, its inscription, and the stratigraphic context in which it was found, dating its deposition to the ninth or early tenth century CE. The study further assesses the possible uses of the object, as well as its significance in illuminating trade networks between the Early Islamic Levant and Viking northern Europe.

Keywords: belemnite fossil, Viking-Abbasid trade, amulets, *materia medica*, Tiberias, Early Islamic archaeology

Tiberias (*Ṭabarīyah*), located on the western shore of the Sea of Galilee, was the capital of the province called *Jund al-Urdunn* throughout the Early Islamic period. Excavations conducted by Yizhar Hirschfeld in the ancient city center revealed remains dating from the first through the eleventh centuries CE, including an array of private and public buildings (Hirschfeld and Galor 2007). The focus of this article is an exceptional find of an inscribed fossil discovered in the constructional fills of a complex dating to the ninth or early tenth century CE, consisting of various rooms and shops. This complex is located south of a peristyle mansion constructed in the late fourth–early fifth centuries and east of a large mosque dated to the Early Islamic period (Cytryn 2016; Miller 2016).

Although the transition of Tiberias into a provincial capital in the late seventh century CE seems to have been relatively uneventful in terms of major changes to existing buildings or the urban plan, the damage inflicted on the city by the earthquake of 749 CE necessitated significant reconstructions. These building

¹ Institute of Archaeology, The Hebrew University of Jerusalem, Haifa Center of Mediterranean History, University of Haifa, ORCID <https://orcid.org/0000-0002-6017-8367>; ² Geological Survey of Israel, ORCID <https://orcid.org/0000-0001-8204-9569>; ³ Rothberg International School, The Hebrew University of Jerusalem; ⁴ Independent scholar

Contact: Shulamit Miller shulamit.miller@mail.huji.ac.il

activities were carried out during the second half of the eighth and ninth centuries CE. Some of the new architecture was constructed over earlier walls, following the axes established during the previous phases. In contrast, the orientation of the entirely new construction was somewhat askew from the earlier lines. An example of this fusion of axes is found in the complex constructed south of the peristyle mansion during the ninth or early tenth century CE.¹ The current article discusses this complex, which was but one component of the extensive remains exposed by Hirschfeld, demonstrating a continuous, city-wide construction process that terminated only towards the end of the eleventh century CE.²

THE ARCHAEOLOGICAL CONTEXT

The peristyle mansion, spanning some 2,500 sq m, was home to one of the members of the local elite (Miller 2015). The original structure, dating to the late fourth and early fifth centuries CE, remained intact and continued in use during the sixth to eighth centuries CE, although many of its spaces were reconfigured over time (fig. 1). A wide channel (WC700), passing in front of the grand southern entrance into the mansion, was considerably larger than other channels constructed in and around the domicile. It most likely indicates the route of a street flanking the house's southern side, which led from the direction of the *cardo* towards the Sea of Galilee. Although the street's pavement must have been robbed in antiquity, this proposal is supported by the location of the mansion's southern entrances, which relates to the line of the alleged street.

In the seventh to mid-eighth centuries CE, new architecture appeared south of the mansion, expanding into the space of the alleged street. At this time, a staircase, W645, was constructed adjacent to the mansion's southern wall, rising from east to west following the natural topography and the course of the earlier street. The location of the stairs may indicate that they were constructed above the northern sidewalk of the alleged street and not on the original pavement itself. Thus, it appears that the staircase replaced or confined the earlier street into a narrower street or alley between the mansion's walls and new construction to the south. Moreover, it seems that a new, nearly parallel street was constructed approximately 10 m south of the earlier street during this period. This is evident

1 Avni (2014: 72–74) emphasised the adherence of the Early Islamic architecture to the orientation of the Roman-Byzantine city. However, this is not always so, especially in the case of domestic or semi-domestic architecture, as discussed here. This is also evident in other locations in the area excavated by Hirschfeld.

2 For an up-to-date summary of the excavations relating to Early Islamic Tiberias, see Avni 2014: 79–85; Cytryn 2016. The architecture and stratigraphy of these periods exposed by Hirschfeld in the city center will be discussed further by Iamim and Miller in the framework of the final report of the excavations at the site.

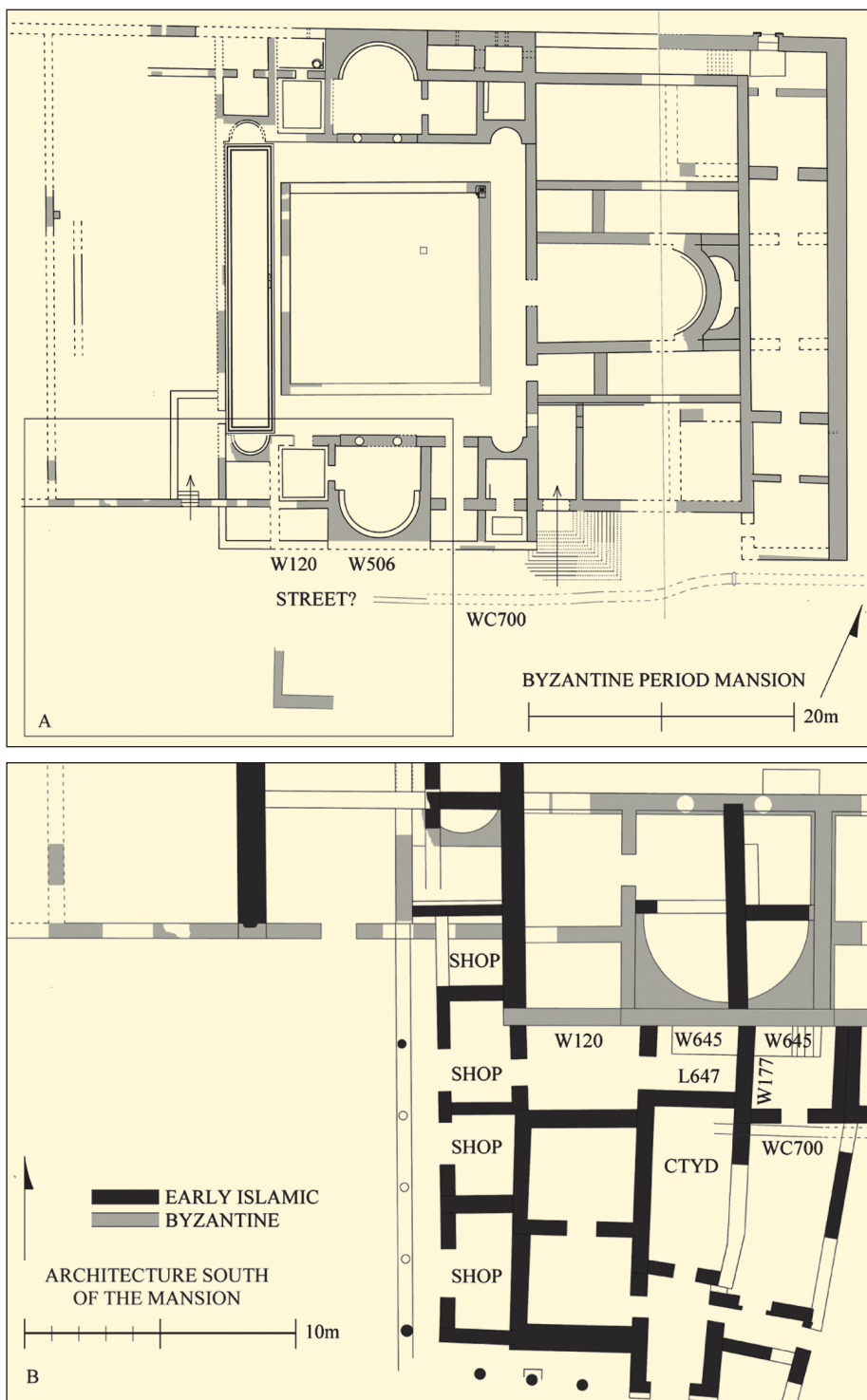


Fig. 1. A. The Byzantine peristyle mansion; B. Architecture south of the mansion, dating to the Early Islamic period (plan: Anna Iamim)

by a row of three columns that may have supported an awning attached to some of the newly constructed architecture, defining the northern side of a street onto which these buildings appear to have opened.

Following the earthquake of 749 CE, construction activity south of the mansion intensified and filled the area between its southern wall and the row of columns mentioned above. The westernmost buildings exposed by Hirschfeld that were newly erected in this area included a complex of several rooms, whose western side was defined by shops opening to the west. These were the earliest of a series of shops later added on the north, above the dismantled peristyle mansion. East of the shops, additional rooms appear to have centered around a courtyard entered from the south via the street lined by the columns. Later construction incorporating the eighth and ninth centuries CE remains made it difficult to determine the exact nature of the complex, whether commercial, domestic, or both.

As part of the construction process of the ninth or early tenth-century CE complex, staircase W645 went out of use when new walls, including W177, were built abutting the southern wall of the former mansion. The uppermost steps of W645 were dismantled, and fills were deposited adjacent to its southern side to raise the surface for new floors. One of these constructional fills, L647, was deposited north of the courtyard, in the northern row of rooms. The inscribed fossil under discussion was found in this fill, mixed with earth and other debris used in the construction. The pottery, coins, and glass deriving from L647 and from the constructional fill beneath it (L759), which was deposited in the same operation, provide a secure *terminus post quem* of 751 CE for the construction.³ Fills of a similar character were deposited in the room east of W177, above dismantled stairs W645, although here, in addition to several mid-eighth century coins, was one of uncertain identification dated to the ninth century CE. Since the deposition of the fills on either side of W177 is stratigraphically contemporaneous, we propose a ninth or early tenth-century CE date for the complex. This may also serve as a *terminus ante quem* for the fossil's use and the date of its inscription.⁴

The architectural characteristics of the complex under discussion include an interior courtyard, irregularly shaped and often ill-aligned walls, the incorporation of earlier architecture, and the apparent merging of domestic and commercial (or industrial) spaces in a structure flanked by streets and alleys. All these features are commonly found in the private architecture of Early Islamic Tiberias. The

3 We thank the following specialists for the dating of this material: A. de Vincenz (pottery), A. Berman (coins), and S. Hadad (glass). The full studies of these finds will appear in the final report of Hirschfeld's excavations at the site.

4 Several later stratigraphic phases were evident south of the mansion, denoting continual use until the mid to end of the eleventh century CE. Due to the number of phases, it does not seem reasonable to date the construction with which L647 was associated any later than the early tenth century CE.

construction technique, consisting of worked and partially worked basalt stones in addition to fieldstones and mud-based mortar, was also common in the architecture of this period. Similar features were found in various excavations in Tiberias, all dating to the Early Islamic period, such as in a series of probes south of Ḥammāt Tiberias (Hartal 2009), at the Shiqmim Beach (Yannai 2014), in the vicinity of the Berenice Aqueduct (Mokary 2011), in the eastern part of a domestic neighborhood in the north of the city (Hartal 2013a), at the center of the modern city (Hartal 2013b), and in the vicinity of the sewage processing plant (Hirschfeld 2004: 14–18; Hirschfeld and Gutfeld 2008). Somewhat more lavish architecture, yet similar in character, was excavated in a neighborhood constructed above the Roman theatre (Atrash 2010; 2012: 86–88) and beside the Roman gate (Stacey 2004: 38–42).

Outside of Tiberias, similar domestic-commercial architecture is evident in several sites in the region dating to the mid-eighth through eleventh centuries CE, such as Bet Shean (Fitzgerald 1931: 15–17; Syon 2004; Mazar 2006: 42–44; Atrash 2009), Caesarea (Arnon 2008: 19–21; Stabler *et al.* 2008: 9–17, 30–32), and Jerash (Gawlikowski 1986: 111–117; Rattenborg and Blanke 2017: 319–324).⁵

THE INSCRIBED OBJECT AND THE INSCRIPTION

An exceptional find, shaped like a small, narrow bullet, and bearing an inscription in *Kufic* Arabic, was found in a room north of the courtyard in L647, as described above (fig. 2). The object, measuring 61 mm long and 10.5 mm in diameter, is brownish-beige and identified as the calcareous (calcitic) endoskeleton of a belemnoid, a fossil mollusk related to extant squids. This group of cephalopods thrived in the oceans from about 345 million years ago. It disappeared some 65 million years ago at the end of the Mesozoic Era (end of the Cretaceous period).



Fig. 2. The *Belemnitella mucronata* from Tiberias (photo: Clara Amit)

5 For the intensified merging of commercial-industrial elements into private houses as a characteristic of urban change during the Early Islamic period, see Walmsley 2007; Avni 2014: 98–100.

The discovered specimen differs from the few belemnoid genera in the Middle East (e.g., Jurassic of Mount Hermon). Instead, it belongs to the species *Belemnitella mucronata* (Schlottheim, 1813), which is a common fossil in Russia and northwestern Europe, e.g., southeastern England, Holland, Germany, and Poland (Christensen *et al.* 1975), weathering out from Upper Cretaceous (Upper Campanian) chalk and argillaceous chalk quarried for construction material.

An Arabic inscription in two lines, with traces of a third, is etched into the belemnite (figs. 3–4). The inscription reads:

كتب يزيد بن / يعقوب [sic]
kataba yazīd bn / ya‘qqūb (kadhā!)
 Yazīd ibn Ya‘qqūb [sic!]



Fig. 3. The Arabic inscription etched on the *Belemnitella mucronata*, line 1 (photo: Clara Amit)



Fig. 4. The Arabic inscription etched on the *Belemnitella mucronata*, line 2 (photo: Clara Amit)

It is evident that the writer had no experience writing on this sort of surface since his hesitation is clearly seen. He wrote the father's name, Ya‘aqūb, in the second line but then did not write a proper *‘ayn* and tried again in the same word, so there are either two *‘ayns* or two *qufs*. Since it was difficult to carve a circular line into the piece, this is also the reason the letter *quf* of Ya‘aqūb looks like a *mīm*. The legend has no diacritical dots.

The way the letter *bā’* of Ya‘aqūb is written without the final stroke of the letters is similar to the way that letter is found at the end of other names in invocations from the eighth century CE, e.g., the last letter in the name Ḥabīb at Dayr Dubbān near Beth Govrin (Sharon 2004: 25, Pl. 6) and in the name al-Mus‘ab at ‘Aqaba (Sharon 1997: 95, No. 2 and Fig. 43).

MEDICAL AND APOTROPAIC QUALITIES OF BELEMNITES

Belemnites (named for the Greek *belemnōn* or dart) may be counted among a common phenomenon of associating apotropaic or medicinal qualities to fossils (van der Geer and Dermitzakis 2008). As is typical in traditional medicine, the shape of the healing object resembles the diseased symptom or organ. Similarly, the shape of a protective amulet recalls the item it shields against.

The earliest source recalling objects possibly identified as belemnites is Theophrastus in his work, *De Lapidibus*, composed in the fourth century BCE (Duffin 2008: 11–28). Theophrastus associates belemnites with lynx stones (*lapis lincis*), which are thought to have been formed from lynx urine, possessing medicinal properties for treating renal diseases. Although post-Medieval sources also link belemnites with lynx stones, Pliny, in his *Historia Naturalis*, notes that he does not believe in the existence of lynx stones. Yet, in another part of his composition, he mentions Fingers of Ida (*Idaian dactyloi*), stones found on Mount Ida in Crete resembling the shape of human thumbs, which may perhaps be identified as belemnites (Plin. Nat. 37.61; Mayor 2011: 71).

Historical sources and ethnographic case studies from Medieval and modern Europe show that people believed the cylindrical, bullet-shape of belemnites was formed when lightning hit the ground, having been hurled from the sky during thunderstorms (Boyadziev 2008). Therefore, belemnites were named thunderbolts, thunderstones, and thunder-arrows in various languages in the folklore of northern European countries. Accordingly, belemnites received magical powers, such as protecting the owner from lightning or other hazards and bringing good luck (Boyadziev 2008; Johanson 2018: 95–97). In England, belemnites are known both as Devil's Fingers and Saint Peter's Fingers, representing opposites of the same traits. They were also used to cure rheumatism since their shape resembles that of idealized, straight fingers (van der Geer and Dermitzakis 2008: 325–326).

Belemnites may also be considered in the broader category of heavenly stones, alongside other fossils, gemstones, and Neolithic-Bronze age stone tools, which were thought to be heavenly charmed and were often mentioned in Medieval European literature as having apotropaic and medicinal properties (Johanson 2018: 16–19). For example, in the eleventh century CE, Bishop Marbode of Rennes attributed thunderbolts the power to shield their owners (and their houses) from being struck by lightning, drowning at sea, losing in court or battle, and assisting in a good night's sleep (Merrifield 1987: 11). In other Medieval contexts, fossils are reported to have been used as amulets for childbirth and for protecting infant children (Gilchrist 2012: 143–144).

As in Europe, fossils and minerals were commonly used over the centuries in Levantine medical traditions, some continuing to this day (Lev and Amar 2000).⁶ Furthermore, while most organic substances recorded in the Early Islamic through the Medieval Levant were locally produced, inorganic substances were often imported, attesting to far-reaching trade networks for *materia medica*. Although in the minority in comparison with animals, and especially plants, mentioned in medical recipes, stones and minerals were used to cure many ailments, including

6 We wish to thank Efraim Lev for his advice and assistance with information on pharmacological traditions in the Levant.

skin and eye diseases, infections, infertility, and more (Lev 2002). The only fossils known to have been commonly used in this region are spines of petrified sea urchins (*Cidaris* sp.), which are informally known as *Lapis Judaicus* or Jew's Stones. In traditional medicine, these fossils are used as diuretics and as a treatment for clearing stones from the urinary tracts, as mentioned in both Greco-Roman and Islamic medical sources (Lev and Dolev 2002: 174).

To date, no material nor textual evidence supports the use of belemnites in traditional medical capacities in the Levant. Furthermore, the carving of a name on the belemnite found in Tiberias indicates that it was not intended to be used in a prescription since this would have necessitated grinding, soaking, or boiling the object. Instead, the inscription appears to point to the usage of the belemnite as a personalized amulet that could be carried by the owner for protection, health, and success. Although lacking a threading hole, the belemnite's length and the inscribed name's position allow us to postulate that thread or a leather strap could have been securely wrapped around the end of the object so that it could be easily worn as a pendant.

AMULETS IN ISLAMIC TRADITION

In the *Qur'ān*, *siḥr*, i.e., magic, is the equivalent of infidelity (*kufṛ*) (VI, 7; XI, 7; XXIV, 43, etc.). In the Hadith, attributing a partner to God (*shirk*) and magic are among the seven sins that merit death (Fahd 2012). Nevertheless, magia and spells play a substantial role in Islamic culture, appearing not only in folklore but also in commentary and hadith literature, in which treatises often detailed magical techniques (Zoran 1996). As described by Al-Saleh (2010): 'A talisman is any object that is imbued with protective powers, and all cultures have manifestations of such objects. In the world of Islam, they bear Qur'anic inscriptions as well as images of prophets, astrological signs, and religious narratives. Many Muslims believe that an object inscribed with the word God (Allah) will protect the person who reads, touches, or sees it and that the word of God has the power to ward off evil. The surface of a talismanic object can be covered with prayers, signs, numbers, and decorative motifs, and the object is carried in a pocket or rolled and placed in an amulet case; some talismans are worn as clothing.' The first text to discuss Islamic amulets is Al-Būnī's (d. AH 622/1225–6 CE) *Shams al-Ma'arif al-Kubra*, although amulets were obviously in existence before the writing of this book.

AMULETS FROM EARLY ISLAMIC PALESTINE

The only known parallel of an inscribed belemnite in the Levant was found in the Temple Mount Sifting Project in Jerusalem, thus lacking a datable archaeological

context.⁷ The inscription on the object from Jerusalem is not as clear as that from Tiberias and requires further study. Since both specimens belong to the same species of *Belemnitella mucronata* deriving from northwestern Europe or Russia, we propose that the belemnite from Jerusalem should be dated more or less to the same time frame as the well-dated one from Tiberias. Based on their similarity, it may be suggested that these objects reflect a broader phenomenon for using belemnites as amulets in Early Islamic Palestine and that additional similar objects should be sought in the broader region.

The belemnites from Tiberias and Jerusalem may now be added to a few amulets and a talisman known from the Early Islamic period in Palestine. These include:

1. Amuletic Arab-Byzantine rings from the seventh or eighth century CE, written in Arabic, comprised of a short religious saying located near the skin of the wearer, while the design is found on top of the bezel, to be seen by the viewer of the ring (Amitai-Preiss and Wolfe 2011: 179). Either **بسم الله** ‘in the name of God’ or **حسبي الله** ‘God is sufficient for me’ are the sole Arabic formulae employed on these rings.
2. An undeciphered magic bowl, written in Arabic letters, is dated to the eighth century CE, originating in Egypt and found in an Umayyad context during the excavations at Ramla (Yehuda 2016).
3. A slab of marble from Khirbat al-Mafjar written in black ink on both of its faces, reading on both sides the same meaningless incantation, with additional ‘names’ (Sharon 2017: 190–191). This talisman is dated 724–743 CE.
4. Part of a magical text on an ostrakon from Shivta, probably from the ninth century CE (Amitai-Preiss, Tepper and Linn 2019: Ostrakon No. 6).⁸

THE BELEMNITE FROM TIBERIAS – BETWEEN EAST AND WEST

The belemnites from Tiberias and Jerusalem expand the repertoire of known amulets from Early Islamic Palestine. Their medicinal or apotropaic qualities may likely have derived from European traditions, providing evidence for the exchange of ideas and knowledge regarding protective and healing practices, yet additional evidence is required to substantiate this suggestion. The objects were personalized, perhaps gaining greater potency by the addition of inscriptions.

The participation of the Abbasids in international and inter-regional economic activities and trade is well attested, both by sea and overland (Montgomery 2008; Shatzmiller 2009). Exchange relationships existed between the Islamic world and

7 Although the object was identified as a belemnite by Lewy, comparable to the find from Tiberias, the staff of the Sifting Project has identified the fossil as a slate pencil: <https://tmsifting.org/en/2017/08/29/our-virtual-cabinet-of-curiosities/>

8 Israel Antiquities Authority No. 47.4686.10.

the central Europeans, Scandinavians, and Rus people from the seventh through the thirteenth centuries CE, intensifying during the ninth and tenth centuries (Jankowiak 2020a: 355–363).

The origins of the European-Abbasid exchange are attributed by Arab writers to Viking merchants traveling to Baghdad during the ninth century.⁹ Nevertheless, trade was not limited to this minimal exchange, and routes that had previously linked the Byzantines and Iranians to the north rapidly developed under the Abbasids, connecting northern and central Europe and Russia with the Near East. Although the precise routes are unknown, they passed through the Eurasian steppe, particularly in the Black and Caspian Seas regions, with the Khazar and Volga Bulghar lands serving as centers of commerce and economic exchange. The meeting points of traders were located in the mercantile settlements, primarily along the Volga, which developed into commercial centers linking the Abbasids with northern Europeans and Rus. Local populations of the Turkic and Khazar Khaganates often mediated the trade networks, serving as middlemen for exchanging goods (Jankowiak 2020a: 358–363).

Over fifteen hundred hoards of Islamic silver coins, dated primarily to the ninth and tenth centuries CE, have been found in settlements along trade routes in Russia, Poland, Sweden, and the Baltic, denoting strong connections between the Vikings and Rus people and the Islamic world (Noonan 1992; Kovalev and Kaelin 2007). As Noonan (1992) has shown, the hoards are particularly useful in tracing commerce networks since the coins' mints indicate their origins in the Islamic world and the dates during which certain routes carried more trade volume.¹⁰ Furthermore, the coins' dates point to fluctuations in the intensity of the trade, both chronologically and geographically. Thus, according to Noonan, the dirhams from the hoards point to two main trade periods, illuminating the networks' directionality. The first wave is dated *c.* 800 to the 880s or 890s CE, in which most mints were Abbasid (Near Eastern). The second and more intense wave is dated *c.* 900–1019 CE, deriving from Abbasid, especially Sāmānid (central Asian) mints.¹¹ Based on the ninth–early tenth centuries CE context in which the belemnite from Tiberias was found, we may suggest that the object was imported to the Levant as part of the first wave of trade between the Vikings/Rus and the Abbasids.

Although it appears that most of the silver hoards may be linked to trading in furs and slaves, other commodities were undoubtedly exchanged as well

9 For a discussion of the earliest Islamic sources, see Hraundal 2013: 56–62.

10 For an expanded study on the distribution of Scandinavian hoards and the social context of the silver-slave trade, see Jankowiak 2020b.

11 Noonan (1992: 244) highlighted the fact that the growth of trade was not consistent or linear, but rather reflects smaller, sub-waves of increasing and decreasing trade engagement within each of the two major waves.

(Oran and Khaznehkatbi 2009: 261–262). Islamic sources from the ninth and particularly the tenth centuries CE attest to trade centered in the Volga, where dirhams and beads were exchanged primarily for furs, slaves, and weapons but also for livestock, wood, honey, wax, and other goods.¹² The coins themselves were used in additional trade, buried in hoards, or reused as ornaments or pendants, and at times even melted down and shaped into jewelry, as is attested by isotopic studies of the Near Eastern and central Asian origins of the silver (Merkel 2016; Audy 2018).

Literary sources and archaeological discoveries also highlight beads among the desired objects exchanged in trade, with preserved examples made from glass, carnelian, millefiori, shells, and rock crystals, mainly originating in the Near East (Callmer 1977; 1997; Jankowiak 2020a: 365–368). An example of objects arriving in the north from the Islamic world is a silver ring found in a mid-ninth century CE tomb of a woman in Birka, Sweden, set with a glass inlay resembling a precious stone. The glass is inscribed in *Kufic* Arabic with the name of Allah, providing evidence of specialty items traveling from the Islamic world to the Viking realm (Wärmländer *et al.* 2015). Additional aspects of these material connections are Islamic weights and scales found in Scandinavian graves among various household instruments (Kish 1959: 164). Other items imported to northeastern Europe are rare but include glass, ceramic, bronze, and silver vessels, textiles, and some floral and faunal specimens, including camels, walnuts, and spices.¹³

To date, however, material evidence of commodities imported from northern Europe to the Islamic world is sparse; the belemnites may serve as an example for objects traded in this exchange.¹⁴ Belemnites are not explicitly mentioned as objects of trade, and it is currently impossible to determine how precisely a Near Easterner of the ninth or tenth century CE would characterise them. Yet, a possible allusion to or frame of reference for similar objects may be recorded by the tenth-century CE geographer al-Muqaddasī in his *Aḥsan al-taqāsīm fī maʾrifat al-aqālīm*.¹⁵ When listing products of commerce exported from Bulghār on the Volga, al-Muqaddasī records fish teeth (or possibly fish bones) alongside other valuable goods such as Slavic (*Saqālib*) slaves, furs, weapons, and more

12 For a translation of Ibn Fadlān, as well as a collection of other accounts of Islamic travelers and geographers and their encounters with northern peoples, see Lunde and Stone 2012.

13 See Jankowiak 2020a: 365–368, with references therein.

14 For a survey of Viking/Rus material culture found in the Volga region, see Androshchuk 2008; Hraundal 2013: 132–136.

15 Noonan (1992: 237–238) commented on the problematics of relying on the Arab sources, which are often not firsthand witnesses of the European-Abbasid commercial exchange. Yet, the attribution of certain goods, such as furs and weapons, to a European origin is widely accepted.

(Al-Muqaddasī: 264; Lunde and Stone 2012: 195–196). While it is difficult to determine the precise meaning of ‘fish teeth’ or ‘fish bones,’ which may be identified as walrus or narwhal tusks (as suggested by Lunde and Stone), it is also possible that al-Muqaddasī could have been referring to lithotherapeutical specimens. These, like the belemnites, have a long history of medical and protective characteristics dating back three thousand years (Duffin 2013). For instance, toadstones, which are fossilized fish teeth (*lepidotes*), were commonly used in Europe for protection against poisons (Duffin 2008: 34–44). *Cinaedia*, fish otoliths, which are part of the fish’s inner ear sensory system, is another possible identification having a long history as a tool of divination in maritime weather. They were used medicinally to cure several ailments, including jaundice, malarial fever, and swelling of the groin (Duffin 2007). While fish otoliths are more easily procured from living fish, toadstones, similar to belemnites, were extracted from fossil beds of the Jurassic and Early Cretaceous periods located in northwestern Europe. Although the connection is tenuous, and physical evidence is currently scarce, it is possible that healing and apotropaic objects, as well as traditions connected to them, played a part in the trans-regional trade between the Vikings/Rus and the Abbasids.

Several scenarios illustrate the path the belemnites traveled from northern Europe to the Levant, yet all remain unfounded to date. It is possible that the object itself was traded or gifted to a Levantine merchant. It may also have switched hands several times along the way, perhaps among middlemen of the steppe khaganates (de la Vaissière 2000). It is also tempting to draw a connection between the Jewish Khazars and the Jewish population of Tiberias or Jerusalem. Although no direct evidence exists for a Khazarian-Jewish Palestinian connection, two tenth-century CE Khazar documents were found in the Cairo Genizah, possibly indicating a Jewish Khazarian-Near Eastern exchange (Golb and Pritsak 1982).¹⁶ Yet another possibility is that the object was borne by a slave brought to Tiberias, as the Persian geographer Ibn Rustah describes slaves traded by the Rus as well-dressed and cared for to provide better profits to their captors (Lunde and Stone 2012: 126). One way or the other, the belemnite became the

16 For revised dates of the Genizah letter and its role in dating Rus historical events, see Zuckerman 1995. While reversing his opinion about the Khazar Jews in his later work, Gil originally noted that the first of the two letters found in the Genizah was addressed to the people of the Yeshiva, likely indicating that it had originally been sent to the Yeshiva located either in Tiberias or in Jerusalem (also known as Yeshivat Geon Ya’akov), and was later transferred along with other documents from the Yeshiva’s archives to Tyre, Damascus, and finally, Fustat (Gil 1987: 146; 2011). Zuckerman (2011) further develops the significance of this letter as an endorsement issued by the Kievan Jewish community for one of its members who had fallen on hard times and was forced to seek assistance from other communities elsewhere.

property of Yazīd bin Yaʿqūb and was either lost or discarded in Tiberias during the ninth or early tenth centuries CE.

The two belemnite specimens from Tiberias and Jerusalem are minor but significant indications of the expansive international trade networks between northern Europe and the Near East, in which the Levant also participated during the Early Islamic period, involving precious commodities, as well as people and ideas.

REFERENCES

Al-Muqaddasī

The Best Divisions for Knowledge of the Regions (Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm), translated by B. Collins, Reading, UK, 2001

Amitai-Preiss, N. and Wolfe, L.A.

2011 Amuletic Bronze Rings from the Arab-Byzantine Transitional Period, *Israel Numismatic Research* 6: 175–186

Amitai-Preiss, N., Tepper, Y. and Linn, R.

2019 Deciphering Early Arabic Texts on Eighth-and Ninth-Century CE Ostraca from the Colt Expedition Findings in Shivta, *Michmanim* 28: 85–100 (Hebrew)

Androshchuk, F.

2008 The Vikings in the East, in Brink, S. and Price, N. (eds.), *The Viking World*, London: 517–542

Arnon, Y.D.

2008 *Caesarea Maritima, the Late Periods (700–1291 CE)*, Oxford

Atrash, W.

2009 Bet Sheʿan, *Hadashot Arkheologiyot* 121, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=1200&mag_id=115

2010 Tiberias, the Roman Theater, *Hadashot Arkheologiyot* 122, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=1381&mag_id=117

2012 The Roman Theater at Tiberias, *Qadmoniot* 144: 79–88 (Hebrew)

Audy, F.

2018 *Suspended Value: Using Coins as Pendants in Viking-Age Scandinavia (c. AD 800–1140)*, Stockholm

Avni, G.

2014 *The Byzantine-Islamic Transition in Palestine: An Archaeological Approach*, Oxford

Boyadziev, K.

2008 Real Arrows or “Darts from Heaven”? Some Ideas on the Interpretation

of Belemnites from Neolithic and Calcolithic Sites in Bulgaria, in Kostov, R.I., Gaydarska, B. and Gurova, M. (eds.), *Geoarchaeology and Archaeomineralogy*, Sofia: 288–290

Callmer, J.

1977 *Trade Beads and Bead Trade in Scandinavia, ca. 800–1000 AD*, Bonn

1997 Beads and Bead Production in Scandinavia and the Baltic Region c. AD 600–1100: A General Outline, in von Feeden, U. and Wieczorek, A. (eds.), *Perlen Archäologie, Techniken, Analysen*, Bonn

Christensen, W.K., Ernst, G., Schmid, F., Schultz, M.D. and Wood, C.J.

1975 *Belemnitella mucronata mucronata* (Schlottheim, 1813) from the Upper Campanian: Neotype, Biometry, Comparisons and Biostratigraphy, *Geologisches Jahrbuch A* 28: 27–57

Cytryn, K.

2016 Tiberias' Houses of Prayer in Context, in Patrich, J., Peleg-Barkat, O. and Ben-Yosef, E. (eds.), *Arise, Walk through the Land: Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of His Demise*, Jerusalem: 235*–248*

de la Vaissière, E.

2000 Les marchands d'Asie centrale dans l'empire khazar, in Kazanski, M., Nersessian, A. and Zuckerman, C. (eds.), *Les centres proto-urbains russes entre Scandinavie, Byzance et Orient*, Paris: 367–378

Duffin, C.J.

2007 Fish Otoliths and Folklore: A Survey, *Folklore* 118: 78–90

2008 *Fossils as Drugs: Pharmaceutical Palaeontology*, Luxemburg

2013 Lithotherapeutical Research Sources from Antiquity to the Mid-Eighteenth Century, in Duffin, C.J., Moody, R.T.J. and Gardner-Thorpe, C. (eds.), *A History of Geology and Medicine*, London: 7–43

Fahd, T.

2012 'Sihr', in Bearman, P., Bianquis, Th., Bosworth, C.E., van Donzel, E. and Heinrichs, W.P. (eds.), *Encyclopaedia of Islam*, 2nd edition online, <http://dx.doi.org/10.1163/1573-3912_islam_SIM_7023>

Fitzgerald, G.M.

1931 *Beth-Shan Excavations 1921 – 1923: The Arab and Byzantine Levels*, Philadelphia

Gawlikowski, M.

1986 A Residential Area by the South Decumanus, in Zayadine, F. (ed.), *Jerash Archaeological Project*, Amman: 107–121

Gil, M.

1987 Khazarian Hebrew Documents of the Tenth Century by Norman Golb and Omeljan Pritsak, *Journal of Near Eastern Studies* 46: 144–146

2011 Did the Khazars Convert to Judaism?, *Revue des études juives* 170: 429–441

Gilchrist, R.

2012 *Medieval Life: Archaeology and the Life Course*, Woodbridge — Rochester

Golb, N. and Pritsak, O.

1982 *Khazarian Hebrew Documents of the Tenth Century*, Ithaca — London

Hartal, M.

2009 Hammat Tiberias (South), *Hadashot Arkheologiyot* 121, http://www.hadashot-si.org.il/Report_Detail_Eng.aspx?id=1097&mag_id=115

2013a Tiberias, the Municipal Park (B), *Hadashot Arkheologiyot* 125, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=4349&mag_id=120

2013b Tiberias, *Hadashot Arkheologiyot* 125, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=4350&mag_id=120&previewit=TrUc

Hirschfeld, Y.

2004 *Excavations at Tiberias, 1989–1994*, Jerusalem

Hirschfeld, Y. and Galor, K.

2007 New Excavations in Roman, Byzantine, and Early Islamic Tiberias, in Zangenberg, J., Attridge, H.W. and Martin, D.B. (eds.), *Religion, Ethnicity and Identity in Ancient Galilee: A Region in Transition*, Tübingen: 207–229

Hirschfeld, Y. and Gutfeld, O.

2008 *Tiberias: Excavations in the House of the Bronzes: Final Report*, Vol. I: *Architecture, Stratigraphy and Small Finds*, Jerusalem

Hraundal, T.J.

2013 The Rus in Arabic Sources: Cultural Contacts and Identity (unpublished Ph.D. diss., University of Bergen), Bergen

Jankowiak, M.

2020a Contacts between the Islamic World and Northern Europe in the Pre-Mongol Period, in Walker, B.J., Insoll, T. and Fenwick, C. (eds.), *The Oxford Handbook of Islamic Archaeology*, New York: 355–373

2020b Flows of Dirhams and Rhythms of the Slave Trade between the Islamic World and North-eastern Europe, in Gruszczyński, J., Jankowiak, M. and Shepard, J. (eds.), *Viking-Age Trade: Silver, Slaves and Gotland*, London

Johanson, K.

2018 *Missing Interpretations: Natural and Residual Finds in Estonian Archaeological Collections*, Tartu

- Kish, B.
1959 Weights and Scales in Mediaeval Scandinavia, a New Proof of Arabic Influence on Northern Europe in Viking Times, *Journal of the History of Medicine and Allied Sciences*, 14(2): 160–168
- Kovalev, R.K. and Kaelin, A.C.
2007 Circulation of Arab Silver in Medieval Afro-Euroasia: Preliminary Observations, *History Compass* 5: 560–580
- Lev, E.
2002 Reconstructed *materia medica* of the Medieval and Ottoman al-Sham, *Journal of Ethnopharmacology* 80: 167–179
- Lev, E. and Amar, Z.
2000 Ethnopharmacological Survey of Traditional Drugs Sold in Israel at the End of the 20th Century, *Journal of Ethnopharmacology* 72: 191–205
- Lev, E. and Dolev, E.
2002 Use of Natural Substances in the Treatment of Renal Stones and Other Urinary Disorders in the Medieval Levant, *American Journal of Nephrology* 22: 172–179
- Lunde, P. and Stone, C.
2012 *Ibn Fadlān and the Land of Darkness: Arab Travellers in the Far North*, London
- Mayor, A.
2011 *The First Fossil Hunters: Dinosaurs, Mammoths, and Myth in Greek and Roman Times*, Princeton — Oxford
- Mazar, A.
2006 *Excavations at Tel Beth-Shean 1989–1996, Vol. I: From the Late Bronze Age IIB to the Medieval Period*, Jerusalem
- Merkel, S.W.
2016 *Silver and Silver Economy at Hedeby*, Bochum
- Merrifield, R.
1987 *The Archaeology of Ritual and Magic*, London
- Miller, S.
2015 The Late Antique Mosaics of Tiberias: Artistic Trends and Architectural Contexts, *Eretz-Israel* 31: 247–255 (Hebrew)
2016 The Urban Plan of Tiberias from its Foundation until the Islamic Conquest in Light of New Discoveries, in Patrich, J., Peleg-Barkat, O. and Ben-Yosef, E. (eds.), *Arise, Walk through the Land: Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of His Demise*, Jerusalem: 221–232 (Hebrew)

Mokary, A.

- 2011 Tiberias, The Berenice Aqueduct, *Hadashot Arkheologiyot* 123, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=1914&mag_id=118

Montgomery, J.E.

- 2008 Arabic Sources on the Vikings, in Brink, S. and Price, N. (eds.), *The Viking World*, London: 550–561

Noonan, T.S.

- 1992 Fluctuations in Islamic Trade with Eastern Europe during the Viking Age, *Harvard Ukrainian Studies* 16: 237–259

Oran, A.F. and Khaznehkatbi, G.

- 2009 The Economic System under the ‘Abbāsid Dynasty, in Siddiqi, M.N. (ed.), *Encyclopedia of Islamic Economics*, London: 257–266

Plin. Nat.

- Pliny the Elder, *The Natural History*, Vol. 6, translated by J. Bostock and H.T. Riley, London, 1855

Rattenborg, R. and Blanke, L.

- 2017 Jarash in the Islamic Ages (c. 700–1200 CE): A Critical Review, *Levant* 49: 312–332

Al-Saleh, Y.

- 2010 Amulets and Talismans from the Islamic World, in *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, 2000, http://www.metmuseum.org/toah/hd/tali/hd_tali.htm

Sharon, M.

- 1997 *Corpus Inscriptionum Arabicarum Palaestinae*, Vol. I/A, Leiden
 2004 *Corpus Inscriptionum Arabicarum Palaestinae*, Vol. III/D–F, Leiden
 2017 *Corpus Inscriptionum Arabicarum Palaestinae*, Vol. VI/J–(1), Leiden

Shatzmiller, M.

- 2009 Trans-Continental Trade and Economic Growth in the Early Islamic Empire: The Red Sea Corridor in the 8th–10th Centuries, in Blue, L., Cooper, J., Thomas, R. and Whitewright, J. (eds.), *Connected Hinterlands: Proceedings of Red Sea Project IV held at Southampton University, September 2008*, Oxford: 119–130

Stabler, J., Holum, K.G., Stanley, F.H. Jr., Risser, M. and Iamim, A.

- 2008 The Warehouse Quarter (Area LL) and the Temple Platform (Area TP), 1996–2000 and 2002 Seasons, in Holum, K.G., Stabler, J.A. and Reinhardt, E.G. (eds.), *Caesarea Reports and Studies: Excavations 1995–2007 within the Old City and the Ancient Harbor*, Oxford: 1–39

- Stacey, D.
2004 *Excavations at Tiberias, 1973–1974: The Early Islamic Periods*, Jerusalem
- Syon, D.
2004 Bet She'an, *Hadashot Arkheologiyot* 116, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=8&mag_id=108
- van der Geer, A. and Dermitzakis, M.
2008 Fossils in Pharmacy: From “Snake Eggs” to “Saint's Bones”; An Overview, *Hellenic Journal of Geosciences* 45: 323–332
- Walmsley, A.
2007 Economic Developments and the Nature of Settlement in the Towns and Countryside of Syria-Palestine, ca. 565–800, *Dumbarton Oaks Papers* 61: 319–352
- Wärmländer, S.K.T.S., Wählander, L., Saage, R., Rezakhani, K., Hassan, S.A.H. and Neiß, M.
2015 Analysis and Interpretation of a Unique Arabic Finger Ring from the Viking Age Town of Birka, Sweden, *Scanning* 37: 131–137
- Yannai, E.
2014 Tiberias, Shiqmim Beach Junction, *Hadashot Arkheologiyot* 126, http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=14710&mag_id=121
- Yehuda, E.
2016 Special Finds: An Egyptian-Arabic Inscribed Bowl, in Yehuda, E. and Paz, Y. (eds.), *An Early Islamic Industrial Site at Ramla (South), The 2008 Excavation Season*, Tel Aviv: 75–78
- Zoran, Y.
1996 Magic Theurgy and Knowledge of Letters in Islam and Their Parallels in Jewish Literature, *Jerusalem Studies in Jewish Folklore*: 19–62
- Zuckerman, C.
1995 On the Date of the Khazars' Conversion to Judaism and the Chronology of the Kings of the Rus Oleg and Igor. A Study of the Anonymous Khazar Letter from the Genizah of Cairo, *Revue des études byzantines* 53: 237–270
2011 On the Kievan Letter from the Genizah of Cairo, *Ruthenica* X: 7–56