Identifying the Stones of Classical Hebrew

A Modern Philological Approach

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Ancient Languages and Civilizations

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Acknowledgements

Introduction

As the scientific revolution transformed the world, objects of bright and varied color became commonplace. Synthetic dyes, colored glass, selective breeding, and electronic visual displays saturate our world with far more color than imaginable to people only a few generations ago. Before these modern innovations, color was valued more highly. Dyed fabrics and gemstones were considered luxury goods in the ancient world[1] due to their limited availability and desirable appearance. Visually attractive and jewelry-suitable stones came to be considered gemstones. The earliest known example is a bracelet of deep-green chlorite dating to 65,000-to-70,000 years ago.[2]

In agreement with this human universal, the Israelites were quite familiar with gemstones. The Hebrew Bible mentions precious stones in a range of contexts, serving a variety of purposes. Precious stones were part of the high priest's garments, regarded as valuable trade goods, and employed as poetic motifs. For over a century, archeological excavations in Israel (and the antiquities market) have produced stamp seals carved out of various precious stones,[3] which must have been imported from across the ancient world. The most famous of these engraved gemstones are undoubtedly the stones of the Priestly Breastplate, twelve gemstones that provoked the imagination of people for millennia. Too frequently overlooked are the many non-precious stones described in the biblical text, used as building materials, ingredients, paints, and for their chemical properties.

As in all domains of the Israelite world, Classical Hebrew must have possessed a sufficient—even rich—vocabulary for naming the various types of stones known to the Israelites. Classical Hebrew being long-extinct, modern readers possess only the names used by the Israelites, and translations of questionable reliability. Existing scholarship has scarcely refined the identification of the biblical stones beyond the translations made in antiquity. With classi-

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1 Simpson, Elizabeth. (2018). Luxury Arts of the Ancient Near East. In *The Adventure of the Illustrious Scholar* (pp. 662–694). Brill.

2 The artifact remains unpublished. http://siberiantimes.com/science/casestudy/features/could-this-stunning-bracelet-be-65000-to-70000-years-old/. Retrieved on 7 August 2023.

3 Avigad, Nahman. (1997). *Corpus of West Semitic Stamp Seals*. Revised and completed by Benjamin Sass. Jerusalem: Israel Academy of Sciences and Humanities/Israel Exploration Society/Institute of Archaeology.

cal languages, the meaning of words can be known most dependably through tradition. Linguistic traditions primarily manifest in the continuous oral transmission of language from one generation of speakers to the next. But with the tradition of the stones' identities long-severed, the art of philology is the only recourse to reconstruct their identities.

Philology of Hebrew words by western scholars is often limited to the text of the Hebrew Bible, the ancient translations, and alleged cognates from other ancient languages. This may be supplemented by references to the New Testament and Greco-Roman naturalistic works. Too often, rabbinic literature is ignored. This selection of sources reflects a Christian bias in academia, obvious historically but currently obscured, which skews the historical picture. The academic consensus at the turn of the 20th century was that the Hebrew language died prior to the turning of the common era, displaced by Aramaic and Greek. The Mishna (2nd century CE) must therefore be written in an "artificial" Hebrew, with biblical vocabulary artificially transplanted into an Aramaic foundation.[4] If Mishnaic Hebrew is an artificial melding of simple Biblical Hebrew with Aramaic, it is of little interest to biblical scholars. This view is now obsolete. The scholarly consensus has shifted to recognize Mishnaic Hebrew as a continuation of Classical Hebrew,[5] which occurred at the same time as interest in early rabbinic texts increased among New Testament scholars.[6]

Despite this shift, rabbinic texts continue to be under-utilized in the elucidation of biblical terms, especially by scholars outside of Israel. Even these Israeli publications remain inaccessible and thus unknown to scholars who do not know Israeli Hebrew. A term seldom encountered in the Bible may be commonplace in rabbinic literature, where the meaning is evident. Take, for example, the plural *hapax* קִשֻּׁאִים *ḳiššuʔīm* in Numbers 11:5. While commonly interpreted as cucumbers (*Cucumis sativus*), the correct identification (and singular!) is found in the Mishna, where we discover that the קִשּׁוּת *ḳiššūṯ* in fact refers to the snakemelon (*Cucumis melo* subsp. *melo* Flexuosus Group).[7] Additional examples are legion.

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4 Wise, Michael O. (2015). *Language and Literacy in Roman Judaea: A Study of the Bar Kokhba Documents*. Yale University Press.

5 Cook, Edward M. (2017). *Language contact and the genesis of Mishnaic Hebrew*. In The Edward Ullendorf Lectures in Semitic Philology: Fourth Lecture, Cambridge: Faculty of Asian and Middle Eastern Studies, University of Cambridge.

6 Bieringer, Reimund, Martínez, Florentino García, Pollefeyt, Didier, & Tomson, Peter (Eds.). (2009). *The New Testament and Rabbinic Literature*. Leiden, The Netherlands: Brill.

7 Paris, Harry S. (2012). Semitic-language records of snake melons (Cucumis melo, Cucurbitaceae) in the medieval period and the "piqqus" of the "faqqous". *Genetic Resources and Crop Evolution*, 59(1), 31–38.

Talmudic literature often glosses obscure Hebrew words with their Aramaic or Greek equivalent, making them priceless for the identification of select words. The *Ḥakhamim* represented the scholarly elite of Jewish society, so were fluent in Hebrew or lived concurrently with those who did. Steeped in the Bible in its original Hebrew, and tasked with preserving ancient oral traditions, a Talmudic gloss constitutes the foremost level of philological evidence. Though not Hebrew speakers themselves, the writings of the Church Fathers may also preserve authentic traditions, acquired through dialogue with Hebrew speakers and Jewish scholars.

Numerous biblical terms were extinct in the spoken Hebrew of the early centuries CE, yet still understood by the Talmudic Sages. An example to illustrate this point—the month הָאֵתָנִים. The standard convention prior to the Babylonian exile was simply to use numbers to designate the months ("first month", "second month", et cetera), and following to use the Babylonian months.[8] The Canaanite months are restricted to part of Kings, and therefore are quite obscure. The Canaanite month *Ethanim* (the seventh month, corresponding to Babylonian *Tishri*) is mentioned only once in the Hebrew Bible, in 1 Kings 8:2.

The Hebrew Bible uses the form הָאֵתָנִים *Hāʔēṯānīm*, a form with the Hebrew definite article *ha-* permanently prefixed to the name (contrast Phoenician *ʾtnm*,[9] LXX Αθανιν). Referring to this system as Canaanite months is somewhat of a misnomer, as these names are Hurrian in origin. Hebrew הָאֵתָנִים '(name of the seventh month)' is borrowed from Hurrian *Attana-* '(name of a month)', with the plural article *=ne*. The etymology of Hurrian *Attana-* is a bigger problem, but the stem is certainly *atta(i)=* 'father'[10] with a derivational morpheme *=na* and perhaps the plural relator *=na*. It would be unlikely for the original Hurrian meaning of the name to be remembered over a thousand years after the extinction of Hurrian, yet a tradition in Talmudic literature indicates just such a cultural memory. Per the version found in the Babylonian Talmud:

רַבִּי אֱלִיעֶזֶר אוֹמֵר: מִנַּיִן שֶׁבִּתְשָׁרֵי נוֹלְדוּ אָבוֹת—שֶׁנֶּאֱמַר: "וַיִּקָּהֲלוּ אֶל הַמֶּלֶךְ שְׁלֹמֹה כָּל אִישׁ יִשְׂרָאֵל בְּיֶרַח הָאֵתָנִים בֶּחָג",יֶרַח שֶׁנּוֹלְדוּ בּוֹ אֵיתָנֵי עוֹלָם

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8   Morgenstern, Julien. (1924). The Three Calendars of Ancient Israel. *Hebrew Union College Annual, 1*, 13–78.

9   Krahmalkov, Charles R. (2000). *Phoenician-Punic Dictionary* (Vol. 90). Peeters. Entry: ʾTNM.

10   Stieglitz, Robert R., Lubetski, M., Gottlieb, C., & Keller, S.R. (1998). The Phoenician-Punic Menology. *Boundaries of the ancient Near Eastern world*, 211–221.
     Briquel Chatonnet, F., Daccache, J., & Hawley, R. (2015). Notes d'épigraphie et de philologie phéniciennes. 2. *Semitica et Classica, 8*, 235–248.

Rabbi Eliezer says: From where is it derived that in *Tishri* the Patriarchs (literally, 'fathers') were born? As it is stated: "And all the men of Israel assembled themselves before King Solomon at the feast in the month of the *Ethanim …*". The month in which the mighty ones of the world were born.[11]

A parallel text attributed to Ḥaninah exists in the Talmud Yerushalmi.[12] Although the original Hurrian etymology was unknown to the transmitters of these traditions—Hurrian was long extinct—the underlying meaning of 'fathers' was preserved by reification with a homiletical etymology.

By trawling the sea of Talmudic literature, Israeli scholars such as Zohar Amar have been able to identify many of the enigmatic plants that occur throughout the Bible.[13] Rabbinic texts are a priceless source for philology when used cautiously. Therefore, I have quoted rabbinic texts when useful in identifying a particular Classical Hebrew stone. Unfortunately, the stones in the Bible are almost completely ignored in early rabbinic literature. This *argumentum ad silentum* may indicate that their identities were already lost by the 3rd century CE. Broadly speaking, Classical Hebrew lithonyms are largely missing from Hebrew texts post-dating the Bible.

Omission does not necessarily indicate absence of a tradition; the exact referent of a particular stone on the Priestly Breastplate is hardly relevant to the legal discussion of the Talmud. Yet it is less likely that the identities of stones would be preserved than plants. As Segal puts it "[a] number of [Classical Hebrew] nouns have disappeared in [Mishnaic Hebrew], especially nouns of a poetical character or of rare occurrence in [Classical Hebrew]."[14] The more obscure the word, the more likely it is to be replaced.[15] The integrity of the rabbinic tradition regarding plants may be attributed to the fact that plants were ubiquitous and preeminently useful in a pre-modern world. Plants were a primary source of food, clothing, building materials, dyeing agents, medicines, and more.[16] That is not true of precious stones, which were luxuries—inter-

11   Talmud Bavli, Rosh Hashanah 11a.

12   Talmud Bavli, Rosh Hashanah 1:2.

13   Amar, Zohar. צמחי המקרא (*Flora of the Bible*) [Hebrew]. Jerusalem. 2012.

14   Segal, Moses Hirsch. (2001). *A grammar of Mishnaic Hebrew*. Wipf and Stock Publishers. 99.

15   Vejdemo, Susanne, & Hörberg, Thomas. (2016). Semantic factors predict the rate of lexical replacement of content words. *PloS one*, *11*(1), e0147924.

16   Bailey, Clinton, & Danin, Avinoam. (1981). Bedouin plant utilization in Sinai and the Negev. *Economic Botany*, *35*(2), 145–162.

nationally traded goods, predating written history.[17] Just as a term may be imported with a stone (a kulturwort or "cultureword"), the term may go extinct when the supply dries up. It is thus unclear if the biblical names of precious stones were still in use during the early rabbinic period (2nd–3rd century CE).

Whether or not the Talmudic Sages knew the identities of the stones, they were lost at some point, and it is possible to establish a *terminus post quem* for the extinction of this tradition. Saʿadya Gaon (882–942) translated the stones mentioned in the Pentateuch into Arabic in his *Tafsir*, but Abraham ibn Ezra (circa 1090 – circa 1165)[18] and Abraham Maimonides (1186–1237)[19] report that Saʿadya Gaon did not possess traditions regarding the identities of these stones. Absent a statement to this effect by the great Gaon himself, one is left wondering whether Abraham ibn Ezra and Abraham Maimonides had a tradition that Saʿadya Gaon lacked a tradition! Epistemological remarks aside, these statements make apparent that a tradition as to the identification of the stones was no longer extant by the medieval period.

The loss of this tradition by the medieval period implicates how the reliability of the ancient translations should be viewed. As Saʿadya Gaon used educated guesses in his translation of the stones, it is reasonable to wonder if the translators of the Septuagint did the same a thousand years prior. The translations of the stones in the Septuagint contradict those of the Aramaic targums, which may be handily explained if the translations were arbitrary for each stone. In his analysis of the Septuagint's translations, Harrell[20] suggests that this may have been the case for certain terms:

> At times, their translations must have been nothing more than educated guesses or arbitrary assignments, and these were probably influenced by the gemstones in common use during the Hellenistic period or perhaps just those traded in Alexandria.

To support his conclusion, he notes that in the Septuagint, a given Greek lithonym may correspond to several Hebrew lithonyms. Taking the reverse perspective, the Septuagint translates a Hebrew lithonym using totally dissimilar Greek

17 Düring, Bleda S. (2021). Crafting Values in Chalcolithic Cyprus and Anatolia. *The Critique of Archaeological Economy*, 71–83.
    Herrmann, Georgina. (1968). Lapis lazuli: the early phases of its trade. *Iraq*, *30*(1), 21–57.
18 Ibn Ezra's Commentary to Exodus 28:9.
19 Abraham Maimonides' Commentary to Exodus 28:17.
20 Harrell, James A. (2011). Old Testament gemstones: A philological, geological, and archaeological assessment of the Septuagint. *Bulletin for Biblical Research*, *21*(2), 141–171.

terms in different verses. Taking שֹׁהַם *šōham* for example, the Septuagint pro-
vides πράσινος *prasinos* in Genesis 2:12, σμάραγδος *smaragdos* in Exodus 28:9,
βηρύλλιον *beryllion* in Exodus 28:20, σμάραγδος *smaragdos* in Exodus 35:27, σμά-
ραγδος *smaragdos* in Exodus 36:13, βηρύλλιον *beryllion* in Exodus 36:20, Ezekiel
28:13 is unclear, σάρδιον *sardion* in Exodus 25:7, σάρδιον *sardion* in Exodus 35:9,
ὄνυξ *onyx* in Job 28:16, while 1 Chronicles 29:2 transliterates שֹׁהַם *šōham* as σοομ
soom. Just within Exodus, three very distant translations! Differing translations
between books may be attributed to different translators (who may or may not
have known the true identity of the stone in question), but a disparity *within
the same book* betrays uncertainty regarding the identity, a revision from a later
period,[21] even a non-literal translation. Most decisively, some of the Septu-
agint's translations are impossible because certain stones mentioned therein
were unavailable to the ancient Israelites.

Such cynicism towards the Septuagint's reliability should be balanced by
historical circumstances which favors its reliability in this area, and thus the
continuation of the tradition as to these stone's identities. Hebrew was still
a living language at the time of the Septuagint's composition, in the 3rd cen-
tury BCE. Though absent from the Mishna and other Late Hebrew works, (some
of) these names may have remained in the spoken language. Even if an average
person no longer used the terms אֹדֶם *ʾōdem* or נֹפֶךְ *nōp̄eḵ*, perhaps the lapidary
guild did in their workshops, or the merchants in their trades. Our picture of
Late Hebrew is largely limited to legal collections and allegories written in the
colloquial register, so an absence of technical gemstone terminology is hardly
surprising. Based on the Late Hebrew corpus that has survived, it cannot be
determined if the identities of the stones were still known.

While it is not clear if the identities of the stones were extant when the
Septuagint was composed, the Priestly Breastplate itself certainly was. Fried
argued[22]—based on references in Josephus, Hecataeus of Abdera, Sirach, The
Aramaic Testament of Levi, The Letter of Aristeas, several texts from Qumran,
and 1 Maccabees—that the אוּרִים *ʾŪrīm* and תֻּמִּים *Tummīm* were functioning
prior to the death of John Hyrcanus (104 BCE). Considering that the אוּרִים *ʾŪrīm*
and תֻּמִּים *Tummīm* were stored in the חֹשֶׁן *ḥōšen* (alternatively, *were* the חֹשֶׁן
ḥōšen[23]), the חֹשֶׁן *ḥōšen* must have been extant in the mid-3rd century BCE,

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21   Cañas Reillo, José Manuel. (2021). The Septuagint and Textual Criticism of the Greek Ver-
      sions. In: *T&T Clark Handbook Of Septuagint Research*.

22   Fried, Lisbeth S. "Did Second Temple High Priests possess the urim and thummim?." *Per-
      spectives on Hebrew Scriptures IV*. Gorgias Press, 2008. 81–110.

23   Bakon, Shimon. (2015). The Mystery of the Urim Ve-Tummim. *Jewish Bible Quarterly*, *43*(4),
      241–246.

when the Pentateuch was first translated into Greek. However, the mere existence of the Priestly Breastplate does not mean that the identities of the twelve stones were well-known. If the narrative contained in the Letter of Aristeas is accurate in its general concept; that seventy-two Jerusalemite scholars went down to Egypt to translate the Pentateuch, it is probable that at least one, if not all of them, were quite familiar with the Breastplate and its adornments. For this reason, the Septuagint has an argument in its favor that even the Aramaic targums cannot rival.

One more point in favor of the Septuagint's reliability. The book you are reading is a philological investigation using context, etymology, cognate comparisons, and other methods to elucidate the identities of the stones mentioned in the Hebrew Bible. It is part of a long tradition of its own, stretching back to Ephiphanus' *De Gemmis* in the 4th century,[24] if not further. But how much further? If the stones of the *ḥōšen* were indeed unknown to the translators, they may have had access to other Classical Hebrew-era documents that have not survived, perhaps a Classical Hebrew adaptation of *Abnu šikinšu*, or some other ancient lapidary. Using methods similar to modern philologists, if a bit less refined, ancient scholars could have reconstructed the referents of particular words. Too little is understood about the philological abilities of ancient Jewish scholars to determine if this is the case, but it does lend some optimism.

Dozens, perhaps hundreds of scholars over the centuries have struggled with the question of the identities of the stones mentioned in the Bible. There is reason enough to treat the Septuagint and other ancient translations as unreliable, so an approach must be pursued that is agnostic towards ancient translations. To identify the stones of Classical Hebrew successfully requires abandoning the ancient translations. That is not to be taken to mean that a particular ancient translation is wrong, only that there is insufficient external evidence to elevate one translation over others.

1   Methodology

Advances in philology depends on a progressive narrative: new scholarship improves on the old. Yet despite increases in the quality and quantity of data, research on the topic failed to progress beyond speculative identifications.

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24   Albrecht, Felix, & Manukyan, Arthur. (2014). *Epiphanius von Salamis, Über die zwölf Steine im hohepriesterlichen Brustschild* (*De duodecim gemmis rationalis*)*: nach dem Codex Vaticanus Borgianus Armenus 31* (Vol. 37). Gorgias Press.

This is surprising considering that other subfields of the Classical Hebrew lexicon (cutting tools,[25] animals,[26] plants,[27] toponyms,[28] and more) have been successfully treated in specialized works, using all of the tools available to the modern philologist. Perhaps counterintuitively, higher quantity and quality data resulted in new treatments on the Hebrew stones becoming more confused, as the Septuagint's translations were supplemented with a better understanding of the identity and semantic range of Greek stone names, the Aramaic translations of the targums, and cognates from other ancient languages.

This gap is a consequence of the highly interdisciplinary nature of the relevant comparative data, which makes determining the identity of even a single stone a daunting task. This might involve understanding the historical phonology and morphology of Hebrew, Ancient Egyptian, Hittite and the other Anatolian languages, Hurrian, Akkadian, Old South Arabian, Greek, Sanskrit and Meroitic, enabled by access to and use of the best historical dictionaries for each of the preceding languages, the primary and secondary sources on precious stones in Mesopotamia, Greece, and the Roman empire, and a working knowledge of the archeological and archeogemological literature. To take advantage of just these resources, functional literacy in Classic Hebrew, Israeli Hebrew, English, French, German, and Spanish is necessary. Furthermore, previous publications on the biblical stones are published in a dozen or so languages.

Previous literature did not investigate the stones of Classical Hebrew using every scholarly tool available, or more precisely, no single study did. Three studies stand out as worthy of particular consideration. Harrell, Hoffmeier, and Williams' *Hebrew Gemstones in the Old Testament: A Lexical, Geological, and Archaeological Analysis*[29] is concerned with the species of stones available in Ancient Egypt. This work was the first to posit availability as the primary constraint for an analysis of what stones the Hebrew Bible might be referring to.

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25   Koller, Aaron. J. (2012). *The semantic field of cutting tools in biblical Hebrew: the interface of philological, semantic, and archaeological evidence.* The Catholic Biblical Association of America.

26   Deysel, Lesley Claire Frances. (2017). *Animal names and categorisation in the Hebrew Bible: a textual and cognitive approach* (Doctoral dissertation, University of Pretoria).

27   Musselman, Lytton John. (2012). *A Dictionary of Bible Plants.* Cambridge University Press.

28   Elitzur, Yoel. (2004). *Ancient Place Names in the Holy Land: Preservation and History.* Hebrew Univ. Magnes Press.

29   Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research, 27*(1), 1–52.

However, the authors did not expand their study to Mesopotamia, where literary sources on gemstones are more plentiful. They failed to utilize linguistics to establish reliable cognates, requiring recourse to the Septuagint to fill in the gaps. While their methodology provides a great starting point, these shortcomings handicapped the study from solving the identities of Classical Hebrew stones convincingly.

The best work on this topic is no work on the topic at all: Benjamin Noonan's *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact*.[30] This book is a comprehensive philological work that addresses many lithonyms, because terms for precious stones happen to be particularly likely to be borrowed (or at least, particularly likely to be *etymologized as loanwords* in previous scholarship). His methodology focuses on known phonological correspondences, sound changes (in Hebrew and donor languages), and textual indications of a particular provenance for the product (and thus the word itself). Using current scholarship, he manages to clarify the meanings and etymologies of many difficult words. But due to the massive scope of his study, he missed a number of obscure (but useful) cognates, and failed to take archeogemological considerations into account that render certain identifications unlikely.

Last and most inaccessible is Zohar Amar's *The Beauty of Gemstone: The Hoshen Jewels and Precious Stones in the Ancient World*.[31] This Hebrew book is a priceless resource for the opinions of various commentators and academics over time, but the author disregards cognates, ancient texts, and linguistics. Amar is an expert in Levantine *realia*, and quite knowledgeable in medieval languages. But because few ancient lithonyms survived into the Medieval period, his background is most applicable to the stones the ancient translators had in mind. These three studies represent the best of the literature on the topic. Other treatments are only worse: be it poorly researched, totally obsolete, or pseudoscientific. A list of these publications is collected at the end of this volume in *Appendix: Index of Publications Concerning Stones in the Bible*.

1.1 *Practical Considerations*

1.1.1 Pre-internet Research Limitations

Pre-internet philological treatments of this topic were quickly rendered obsolete by the advent of the internet and research search engines. A scholar could

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30 Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press.

31 Amar, Zohar. (2017). *The Beauty of Gemstone: The Hoshen Jewels and Precious Stones in the Ancient World*.

not have been aware of nor gain access to the numerous obscure books, articles, and catalogs utilized in this work without the internet, placing critical data out of reach. Older (pre-2010) treatments of biblical stones often contain valuable information, but date themselves by the way research is now done, using *keywords* and *cited by*s.

1.1.2   Poor Bibliography

For any study, a strong grasp of the most important research on the topic of interest is crucial. Yet previous investigations—with few exceptions—failed to engage with the vast body of existing literature on biblical stones (the reasons for this are varied, but irrelevant). However, if scholars do not or cannot build on previous scholarship, it is exceedingly difficult for a field to advance.

1.1.3   Linguistic Barrier

Part and parcel with the issues enumerated above is a linguistic barrier to research written in languages other than English. Prior to the 20th century, a substantial portion of scholarship on the Hebrew language was written in German, now unintelligible to many interested in this topic. Even now, Akkadian literature is substantially written in German. To this may be added Egyptological literature in German and French, Meroitic research in French, biblical/archaeological scholarship in Israeli Hebrew, with a smattering of Russian, Spanish, and Latin. A handful of classicists may be prepared to engage in this linguistic buffet, but this obstacle hinders anyone else.

1.2   *Textual Considerations*

1.2.1   Translation Biases and Issues

Contrary to previous authors, I do not think that the ancient translations are particularly useful for elucidating the identities of these stones. In fact, biases towards particular translations resulted in certain stones being misidentified for centuries. Historically, a philological analysis of these words consisted of consulting a translation, whether the Septuagint (for Christians and academics) or Midrashic literature (for Jews), then determining which stone the translation must be referring to. Taking the accuracy of the ancient translations for granted, appealing to ancient translations just moves the goalposts. Not one of this book's readers is a native Koiné Greek speaker, and the age of Targumic Aramaic has long since past. To rely on an ancient translation merely shifts the question from which stone the Hebrew term designates to which the translation does. This is actually an easier task, as these languages were spoken much closer to the present day than was Classical Hebrew, and there are far

more descriptions than Classical Hebrew. Yet misidentifications of lithonyms in Greek and Latin have abounded.[32]

The ancient translations also regularly contradict each other,[33] and there is little objective reason to prefer one translation over the other. To favor one particular translation—even on a case-by-case basis—is unscientific. The traditional reliance on these translations was predicated on the assumption that the translator(s) knew the Hebrew term, using an equivalent Greek (or Aramaic, et cetera) term to translate. Because we cannot—in isolation—determine whether a certain translation is reliable or unreliable, ancient translations can only "be trusted only where corroborated by better evidence, and there unneeded"[34] to appropriate a phrase. That is not to say ancient translations are useless—they provide the starting point for further exploration. Therefore, an analysis must be translation-neutral: neither accepting the ancient translations uncritically, nor ignoring them.

1.2.2   Biblical-Internal

Both the Hebrew Bible itself and the vast array of other ancient writings provide ample material regarding the color, provenance, and uses of precious stones. When correct cognates are identified, connections can be drawn between material from different places and times to elucidate an etymology or identity. It is an unforgivable error to overlook the information provided in the Bible itself. The most useful evidence of this sort is a geographic association or visual description. A provenance, analogy to a natural phenomenon, or comparison to other substances is high-caliber information because it is immune to the *etymological fallacy*. Unfortunately, only a few verses contain useful information; they are quoted in the relevant chapters.

1.2.3   Ancient Textual Sources

Ancient texts provide information that allow lithonyms to be matched to known minerals, often discussing the availability and provenance of particular stones. Scholars are fortunate to possess several ancient gemological sources invaluable for understanding precious stones in antiquity. At a minimum, the

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32   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

33   For comparative tables of identifications, see: Amar, Zohar. (2017). *The Beauty of Gemstone: The Hoshen Jewels and Precious Stones in the Ancient World*.

34   Bagnall, Roger S. (2002). Alexandria: library of dreams. *Proceedings of the American Philosophical Society*, *146*(4), 348–362.

primary classical texts must be consulted: Theophrastus' *On Stones*,[35] written in Greek in the 4th or 3rd century BCE, and the thirty-seventh book of Pliny the Elder's *Natural History*[36] written in Latin in the 1st century. To these Greco-Roman sources must be added *Abnu Šikinšu*,[37] a bilingual Sumerian-Akkadian text which lists dozens of stones by name, describing their appearance and use. Unfortunately, *Abnu Šikinšu* is extant only in fragments. Less important ancient texts may also be valuable. Ancient texts must be used cautiously: the ancient Israelites conceptualized gemstones differently from the Greeks of a millennium later, and availability differed over time and geography.

1.3   *Material Considerations*

1.3.1   Physical

The Israelites engraved the stones of the Priestly Breastplate using the tools available to them. The hardest available material for engraving gemstones was emery (Hebrew *šamīr*), which has a maximum absolute hardness of 400.[38] On this criterion alone, diamond can be excluded from the Priestly Breastplate, as diamond has an absolute hardness of 1500.[39]

1.3.2   Archeological

While today it is possible to obtain nearly every sort of precious stone imaginable, the ancients had no such luxury. Even the gemstones available as early as the Hellenistic period (333–164 BCE) were not necessarily available in Pre-Exilic Israel, therefore archeological evidence is necessary to clarify which precious stones were available, at what time they were available, and from where they originated. It is fortunate that the Levant is perhaps the best excavated area in the world,[40] so data is plentiful. Dating ancient mines to determine when mining first commenced may also aid researchers in determining when a stone was

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35   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press.

36   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 37.

37   Schuster-Brandis, Anais. (2003). Tupfen und Streifen: Erkenntnisse zur Identifikation von Steinnamen aus der Serie abnu šikinšu "Der Stein, dessen Gestaltung …". *Altorientalische Forschungen*, *30*(2), 256–268.

38   Mukherjee, Swapna (2012). *Applied Mineralogy: Applications in Industry and Environment*. Springer Science & Business Media. 373.

39   Ibid.

40   Greenberg, Raphael. (2019). *The Archaeology of the Bronze Age Levant*. Cambridge University Press.

TABLE 1   Availability in second millennium BCE Egypt[a] of gemstones previously suggested for the priestly breastplate[b,c]

agate	✓	heliodor		peridot	✓
amber	✓	heliotrope	✓	pyrite	✓*
amethyst	✓	hematite	✓*	rock crystal	✓
anthracite	✓*	hessonite	✓	ruby	
aquamarine		hyacinth/jacinth		sapphire	
carnelian	✓	jade	✓	sard	✓
cat's eye		jasper (various)	✓	sardonyx	✓
chalcedony (various)	✓	jet	✓*	serpentinite	✓
chrysolite		labradorite		sodalite	✓
citrine		lapis lazuli	✓	stibium	✓*
corundum	✓*	Libyan desert glass	✓	tiger's eye	
diamond		malachite	✓	topaz	
emerald		mother-of-pearl	✓	turquoise	✓
galena	✓*	obsidian	✓	zircon	
garnet	✓	onyx	✓		
goshenite		opal			
green chalcedony	✓	pearl	✓		

a   Harrell, James A. (2012). Gemstones. *UCLA encyclopedia of Egyptology*, *1*(1). Data supplemented through personal communication.
b   Collected from: https://en.wikipedia.org/wiki/Priestly_breastplate. Accessed 28 August 2023.
c   Amar, Zohar. (2017). *The Beauty of Gemstone: The Hoshen Jewels and Precious Stones in the Ancient World.*
* marks stones that were available but considered non-precious in antiquity

first and last available, for those stones which were limited in their occurrence to one or a few sites. This archeological data makes it possible to conclude that emeralds from Egypt, diamonds from Sri Lanka, or aquamarines from India were completely unavailable to the ancient Israelites. For the availability of select precious stones previously identified with stones on the Priestly Breastplate, see Table 1.

1.4   *Linguistic Considerations*

Chief among the issues with previous treatments of biblical stones was a disregard for historical linguistics. A true cognate allows scholars to identify the meaning of a semantically obscure Hebrew word by analogy to a word in another ancient language. To oversimplify it, if Hebrew *X* and Egyptian *X* are cognate, and Egyptian *X* means *Y*, then it is reasonable to posit that Hebrew

X also means *Y* (this oversimplification results in the *etymological fallacy*, discussed at greater length below). A false cognate would thus lead to a false equivalence. Applied properly, linguistics will link key historical information (that may lead to an identification), applied improperly, linguistics may obfuscate the historical scenario. Therefore, it is crucial to be able to sort true cognates from false friends.

Linguistic comparison has been under-utilized in correctly identifying ancient lithonyms. Previous scholarship missed numerous cognates, which this work has hopefully remediated. The medievals would compare obscure Hebrew words with Arabic and Aramaic look-alikes. However, it happens that Arabic and Aramaic lack cognates to the Hebrew gemstones, in particular those on the Priestly Breastplate. The lack of Arabic and Aramaic cognates for Hebrew gemstones may explain a difficult statement in the *Kuzari*,[41] which seems to imply that the names of the Hebrew stones were *not* borrowed:

> אראית וצף אלתורה ללמשכן ואלאפוד ואלחשן וג׳יר ד׳לך אד׳ אחתאג אלי אסמא
> ג׳ריבה מא אכמל מא וגדה ומא אגמל אנתטׁאם אלוצף. וכד׳לך אסמא אלאמם ואצנאף
> אלטיור ואלאחגאר.

> Have you seen how the Torah describes the *miškan* and the ephod and the *ḥōšen* and that it isn't the case that it needs any foreign names? How perfect is what is found and how beautiful is the organization of the description! And in the same way the names of the nations and the kinds of birds and stones.[42]

Linguistic comparison would bear little fruit before the rediscovery of Akkadian and other extinct languages.

1.4.1   Accurate Translations

Inaccurate identifications of Greek lithonyms have continued to proliferate despite recent treatments which correctly identify them according to the species of gemstones available at the time (known through archaeology). In particular, the scholarship of Thoresen[43] has increased understanding of the stones mentioned in Greek texts by leaps and bounds. Greek/Latin translations of

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41   Part 2, 68.

42   Appreciation to Dr. Benjamin Suchard for this translation from the original Judeo-Arabic.

43   Thoresen, Lisbet. (2017). Archaeogemmology and Ancient Literary Sources on Gems and Their Origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

Hebrew lithonyms with doubtful reliability (see 1.2.1) must be distinguished from Greek/Latin cognates, for which a correct identification is invaluable.

1.4.2   Etymological Fallacy

The etymological fallacy is endemic in previous works on ancient stones. The etymological fallacy involves the assumption that the etymology of a word indicates its meaning.[44] This neglects the possibility of semantic change, the natural lexical change in which a term expands or restricts its range of referents. Based on the descriptions of stones found in ancient texts, it is evident that the ancient conceptual and categorical system differs from the modern system in a number of respects. Our terms, though related to those found in ancient texts, may be totally misleading.

A good illustration is the problem of the missing emerald, discussed in Chapter 5. Despite the fact that emeralds are not known from the ancient Levant until the 3rd century BCE, *bāreḵeth* is traditionally translated as *emerald* based on the Septuagint's translation σμάραγδος *smaragdos*. It happens to be that σμάραγδος *smaragdos* referred to a number of green precious stones, so there is no particular reason to identify *bāreḵeth* with emerald, yet this correspondence is ubiquitous. Dictionary glosses may not accurately reflect the meaning of a word, the sheer number of obsolete glosses still cited in recent research is surprising.

With minerals, stones, and thus gemstones, a phenomenon is at play that goes beyond regular semantic change: the scientification of the discipline. In Pliny's time, and for millennia before and after, stones were categorized based on their practical properties: color, hardness, origin, uses, and so on. Consider Pliny's description of Latin *iaspis* (the etymon of *jasper*) in his *Natural History*:[45] "Iaspis, too, is green, and often transparent …" This differs sharply from the modern definition, which defines *jasper* as "a poorly defined lapidary name for a red (due to hematite inclusions) to variably coloured chalcedony".[46] Today, stones are categorized on the basis of chemical, crystal structural, and other scientific qualities. Let's reconstruct how the scientification of this term might have worked. *Green and often transparent* is not a scientifically meaningful category, it would include minerals of various chemical and structural classes.

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44   For a list of examples and discussion of this flaw, see "Common Fallacies in Semantics" in Carson, Donald A. *Exegetical fallacies*. Baker Books, 1996. 26.

45   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 37.

46   Mindat.org, entry: jasper. www.mindat.org/min-2082.html. Retrieved on March 9, 2023.

With the scientification of geology in mind, the semantic shift may be represented as: a generic term for transparent green stones → a specific term for green chalcedony (cryptocrystalline SiO_2) → a generic term for different gem-grade chalcedonies.

1.4.3   Direct Corroboration

On rare occasions, an artifact's inscription will self-reference the material of which it is composed. No artifact of this description has been found bearing a Hebrew inscription, but even those inscribed in other languages can be used to definitively establish the identification of a cognate. Similarly, several Ancient Egyptian stone terms have been confirmed because they were mentioned in inscriptions established in the vicinity of ancient mines. Because the exact types of gemstones mined at a given location can be discovered through fragments in dump pits or even the geology of a particular location, the stone(s) mined at a location and the stone terms mentioned in an inscription can be positively linked. In either case, notable cognates and their attestations on relevant artifacts have been mentioned where appropriate.

1.4.4   Etymology

Comparative linguistics remains one of the best philological methods since its formulation (or at least, popularization) during the Islamic Golden Age. The advent of the Neogrammarian hypothesis in the 19th century, with the discovery that languages evolve according to regular sound laws, enables modern scholars to reconstruct the proto-language and the shape of the words found in it. The best reconstruction of the vocabulary of Proto-Semitic is that of Kogan,[47] although it covers little within the scope of this book. Suchard[48] precisely reconstructed the evolution of vowels from Proto-Semitic to Tiberian Hebrew. His book contains many examples of paradigmatic words which may be compared to the lexemes in question.

To determine the plausibility of two similar words being cognates, it is necessary to possess a set of reliable reconstructions for those ancient languages over a diachronic axis. Without reliable historical reconstructions of these languages, the equivalence between two ancient words is mere speculation: one word looks sort of like the other. Hebrew underwent dramatic changes in the

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47   Kogan, Leonid. (2011). 8. Proto-Semitic Lexicon. In *The Semitic Languages* (pp. 179–258). De Gruyter Mouton.

48   Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019.

phonological realization of its consonants[49] and vowels,[50] so it is only through historical reconstruction that the borrowed protoform which underlies the Tiberian word may be recovered.

1.4.4.1   *Inherited Terms*
No lithonyms have been reconstructed to the Proto-Semitic level by previous scholars.

1.4.4.2   *Innovations*
A Hebrew innovation is a new word formed from an existing root and pattern or an old word repurposed with a new meaning.

A few common schemata were used to generate the names of stones in ancient languages:

1.   For the place of origin (Greek σάρδιον *sardion* 'carnelian', after the city of Sardis).
2.   For the group from whom it originated (Old French *turquoise* 'turquoise' after *turc* 'Turk'. Although turquoise did not originate in Turkey, the French acquired turquoise through the Turkish).
3.   For a quality of its appearance like color, luster, etc. (Akkadian *sāmtu* 'carnelian' from the color term *sāmu* 'red').
4.   For a quality of its utility (Greek πυρίτης *pyrites* 'pyrite' based on its use for igniting fire (πῦρ *pyr*)).

1.4.4.3   *Borrowings* (*Loanwords*)
Hebrew and nearby languages were spoken in the vicinity of one another, allowing the transfer of loanwords between them. Comparing Hebrew lemma with Akkadian and Ancient Egyptian is particularly productive, because they loaned many words into Hebrew, while large written corpuses for Akkadian and Egyptian exist through which the identities of their lithonyms may be inferred. Working with foreign terms requires an understanding of a different phonology and the phonological development of Classical Hebrew. Because Hebrew and Egyptian both underwent extensive phonological change, the source of a Hebrew term in Egyptian might not be obvious. Correspondence must be demonstrated by analyzing the Hebrew form for corresponding features, these have been explained phonologically.

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49   Groen, Jorik FJ. (2015). Northwest Semitic in the Second Millennium BCE. [Master's thesis.]
50   Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019.

Studying the donors of lithonyms and their relationship to the original sources of precious stones is an untapped mine for Hebrew scholars. The donor language of a term is a good (even if imperfect[51]) indicator of where an entity originated. This is particularly true of traded items. The donor language of a word correlates with the place of origin. English *jalapeno* is borrowed from Spanish because English-speakers first came into contact with *jalapenos* from Spanish-speaking people. The study of loanwords in Classical Hebrew has matured in the last few decades, becoming increasingly focused on phonological correspondences across vocabulary, which allows a data-driven approach. Dr. Benjamin Noonan's *Non-Semitic Loanwords in the Hebrew Bible: A lexicon of language contact* (2019) is the most current and advanced study of this sort.[52] He articulates six criteria for identifying loanwords, which I have "loaned" for this study:[53]

1. Abnormal phonology and/or morphology
2. No viable intra-Hebrew etymology with irregular correspondence among Semitic cognates
3. Spelling variance
4. Foreign geographical association
5. Foreign context
6. Semantic domain

Each of these criteria has been applied to identify borrowed terms, because identifying the language of origin may indicate identity. The names of precious stones are particularly inclined to be borrowed because gemstones are commonly traded items. Thus to some extent, this book builds on Noonan's research on loanwords in Classical Hebrew.

1.5 *Deductive Reasoning*

Finally, a degree of common sense (more formally, *deductive reasoning*) is appropriate. Two stones on the Priestly Breastplate must be distinguishable in some way. However, this carries its own hazards. If one stone is misidentified, then contrasting it with other members is a pretext for misidentifying other words. Therefore, I have only applied this method sparingly.

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51   While this framework is useful, it must be applied critically. Carnelian is not found in ancient Canaan, but אֹדֶם *ʾōḏem* is a Hebrew-internal innovation (as are all its sister-terms for carnelian in Ugaritic, Akkadian, and so on). This exception may be attributed to the ubiquity of carnelian to the ancient Semites.

52   Noonan already examined several of the terms analyzed in this book, though his study was flawed.

53   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 12–14.

Any analysis of this subject is faced with a mountain of misinformation, a product of errors and outdated information in previous scholarship. Therefore, I have attempted to briefly refute alternative possibilities which other scholars proposed previously. Although occasionally redundant, a decisive refutation of erroneous ideas instead of the ever-increasing accumulation of opinions is necessary to advance the scholarship on this topic.

2   Terminology/Scope

It has been my intention to limit the scope of this work to Classical Hebrew stones proper. Scholars treating this topic in the past have often included non-mineral substances in their studies, despite no evidence that the Israelites considered them to be stones, as some have alleged. Non-mineral substances excluded from this book include: בְּדֹלַח *bəḏōlaḥ* '(a type of resin)', הֹבֶן *hōḇen* '(ebony or african blackwood)',[54] זְכוּכִית *zəḵūḵīṯ* 'glass', חַשְׁמַל *ḥašmal* 'arsenical copper',[55] סֹחֶרֶת *sōḥereṯ* 'faience',[56] פְּנִינִים *pənīnīm* 'pearl(s), jewels',[57] קֶרַח *ḳeraḥ* 'ice', רָאמָה *rāmā* 'seashell', and שֵׁן *šēn*, שֶׁנְהָב *šenhāḇ* 'tooth, ivory'. These terms refer to non-mineral substances, except for סֹחֶרֶת *sōḥereṯ* 'faience' and perhaps קֶרַח *ḳeraḥ* 'ice' (technically a mineral, but rarely treated so by scientists[58]). Stones and minerals not important enough for inclusion as their own chapter have been assembled in Chapter 20.

I have carefully chosen the terminology in this book for precision and aesthetics. *Classical Hebrew* is preferable to "Biblical Hebrew", because it emphasizes that Hebrew existed as a real language beyond the Hebrew Bible, which include the liturgy, poetry, and other compositions written long after the language ceased to be spoken, like *Classical Latin*. Likewise, I prefer *Late Hebrew* to "Mishnaic Hebrew" because this term includes linguistic differences in the Tosefta and *baraythoth* not found in the Mishnah and emphasizes the linguistic continuity from Classical to Late Hebrew. A *lithonym* is a name of a particular type of stone, akin to *toponym* (place name) or *anthroponym* (a person's name).

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54   Ibid, 90–91. However, his identification with african blackwood is overconfident as *Dalberiga melanoxylon* and *Diospyros mespiliformis* were both attested from PWNT. See *Cooper* 285–291, who cites Egyptian texts that support *Diospyros* spp.

55   Forthcoming.

56   Ayil, Ephraim. (2025). The Identity, Etymology, and Material Context of Sōḥereth in Esther 1:6. *Vetus Testamentum*.

57   Burrows, Eric. (1941). Notes on the Pearl in Biblical Literature. *The Journal of Theological Studies*, 42(165/166), 53–64.

58   https://www.minerals.net/mineral/ice.aspx. Retrieved on 18 April 2023.

Lithonym has gained little traction among archeogemologists so far, but should be more widely adopted, as the history of lithonyms often parallels the history of a stone.

Archeologists and philologists are often imprecise with geological terms. *Alabaster* has been applied to two very different stones in Egyptological literature: travertine and gypsum.[59] Travertine and gypsum were used for different purposes by the ancients and were certainly differentiated, scholars would be prudent do the same. Likewise, I have used *serpentinite* in lieu of the ubiquitous but geologically broad "serpentine". In accordance with these best practices, a few terms have been innovated. Borrowing from the English of New Zealand, I use *greenstone* as a catch-all for any green precious stone. This term is an apt translation of Greek σμάραγδος *smaragdos*, which designated a broad range of green gemstones. Similarly, *iaspis* is used to describe any stone designated by the Greek term ἴασπις or its cognates. I compounded the elements in *eilatstone* to clarify that this is a specific type of rock, not the bedrock of the city of Eilat.

I have been conscientious to avoid Eurocentric terminology where it is most damaging. The term 'near eastern', while traditional, has the implication of orienting ancient Semitic peoples to the (near) east of Europe. I am neither European nor a resident of Europe, in fact, western Europe would be my near east! Ergo, I use the more neutral term Levant (and its corresponding adjective *Levantine*) to refer to the same geographical area scholars refer to as the Near East.

3   Limitations/Preface

In every area that previous treatments fell short, this one does as well. To assemble a volume on the subject of biblical stones, their identities and etymologies, drawing together all relevant knowns (as much as practically possible) while advancing original ideas, is something that hasn't been done comprehensively. I am hopeful that I have been generous in collecting the relevant evidence, thorough in my analysis, confident where the identification is secure, and noncommittal where it is not. The beauty of academic culture (in theory and—I pray—in practice) is that previous conclusions are challenged and erroneous ideas superseded by better ones. I do not delude myself into believing this attempt is perfect. As the most comprehensive and well-reasoned treatment

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59   Harrell, James A. (1990). Misuse of the term "alabaster" in Egyptology. *Göttinger Miszellen*, *119*, 37–43.

on the stones of the Hebrew Bible, it can provide the starting point for future studies to build on without needing any other treatment of the subject. Therefore, I ask the reader's forgiveness for any shortcomings, and hope that every erroneous fact or mistaken hypothesis which I have restated or advanced will be corrected in future publications by greater scholars.

The *Ḥōšen*—Priestly Breastplate

The most famous reference to stones in the Hebrew Bible is the description of the חֹשֶׁן *ḥōšen*, the gem-fastened breastplate of the Israelite High Priest. The original, primary and most authoritative description is that found in the book of Exodus (chapters 28 and 35), where the חֹשֶׁן *ḥōšen* is described among of the garments of the High Priest. Here a raiment most provoking to the imagination is detailed. The חֹשֶׁן *ḥōšen* was composed of twelve precious stones, each inscribed with the name of one of the twelve tribes (Exodus 28:17–20):

וּמִלֵּאתָ בוֹ מִלֻּאַת אֶבֶן אַרְבָּעָה טוּרִים אָבֶן טוּר אֹדֶם פִּטְדָה וּבָרֶקֶת הַטּוּר הָאֶחָד׃
וְהַטּוּר הַשֵּׁנִי נֹפֶךְ סַפִּיר וְיָהֲלֹם׃
וְהַטּוּר הַשְּׁלִישִׁי לֶשֶׁם שְׁבוֹ וְאַחְלָמָה׃
וְהַטּוּר הָרְבִיעִי תַּרְשִׁישׁ וְשֹׁהַם וְיָשְׁפֵה מְשֻׁבָּצִים זָהָב יִהְיוּ בְּמִלּוּאֹתָם׃

Set in it a setting of stone, four rows of stone. (The first) row: *ʾōḏem*,
  piṭḏā, and *bāreḵeṯ*;
the second row: *nōp̄eḵ*, *sappīr*, and *yāhălōm*;
the third row: *lešem*, *šəḇō*, and *ʾaḥlāmā*;
and the fourth row: *taršīš*, and *šōham*, and *yošp̄ē*. Woven with gold they
  shall be in their settings.

Whether the implied twelve tribes included Levi and Joseph or Ephraim and Manasseh is not explicit, but the implication of the phrase "Sons of Israel" (Exodus 28:21) appears to be the twelve sons of Jacob, which would include Levi and Joseph, not Ephraim and Manasseh.

Josephus describes these twelve stones as "outstanding in size and beauty, an ornament not obtainable by men because of the exceeding size of its value." The practical implication of the size of these stones is recounted "And whereas the rings were too weak of themselves to bear the weight of the stones, they made two other rings, of a larger size, at the edge of that part of the breastplate …"[1] It is unwarranted to dismiss Josephus' claim—that the twelve stones on the חֹשֶׁן *ḥōšen* were exceptionally large—as legendary or exaggerative. Jose-

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1 Josephus, *Antiquities of the Jews*, Book 3.

phus adds a very practical detail that bolsters his claim: the addition of two larger rings to the breastplate to accommodate the extra weight of these sizable gemstones.

A circumstantial detail also supports the great size of the gemstones. the gemstones would have been the crème de la crème of the gifts offered to the tabernacle. Metals can be remelted, fabrics respun, yet once a precious stone is cut, it cannot be uncut. It is often overlooked that the Bible does not state that the stones were all of the same size or cut, as what is large for one species of stone is small for another. However, the requirement that the gemstones to be oriented in rows may support the traditional rendering of a three-by-four grid with rectangular gemstones. With the basic description of the Priestly Breastplate somewhat resolved, let us transition to a more fraught topic: its significance.

Whereas the Pentateuch prescribes that the twelve stones correspond to the children of Israel, Josephus argues that the stones represent the months of the year or the zodiac. Pena shows[2] that priestly breastplates had astronomical associations among pagans in the Roman empire. Broadly speaking, Josephus' description of the priestly garments is framed by a rhetoric for impressing his Roman audience.[3] Therefore, his description of the symbolic meaning of the חֹשֶׁן ḥōšen should not be equated with how the Priestly Breastplate was understood by its original Israelite target audience. However, Josephus' Romantic allegorizing was impactful in cultural-historical terms, as it is the source of the birthstone concept.

As with many of the ritual laws (Hebrew חֻקִּים ḥukkīm) prescribed in the Pentateuch, the origin of the Priestly Breastplate and its associated articles lies in the ritual iconography and traditions of ancient Levantine religions. Tigay[4] suggests that the gemstones of the חֹשֶׁן ḥōšen served as "votive seals", which were gemstones deposited in temples engraved with a prayer to the deity. His hypothesis, however, is severely weakened by the fact that the חֹשֶׁן ḥōšen was dissimilar with votive seals in its most essential features. The חֹשֶׁן ḥōšen was inscribed with the names of the Sons of Israel, not a prayer, and was only brought into the Temple on rare occasion. The dissimilarities mitigate against a relationship between the חֹשֶׁן ḥōšen and votive seals.

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2   Ibid.

3   Pena, Joabson Xavier. (2021). Wearing the Cosmos: The High Priestly Attire in Josephus' Judean Antiquities. *Journal for the Study of Judaism*, *52*(3), 359–387.

4   Tigay, Jeffrey H. (2007). The Priestly Reminder Stones and Ancient Near Eastern Votive Practices. *Shai le Sara Japhet. Studies in the Bible, its Exegesis and its Language. Jerusalem: Bialik Institute*, 339–355.

Nihan and Rhyder[5] suggest a more plausible purpose for the חֹשֶׁן *ḥōšen*. They point to the fact that the stones were donated by the tribes and were "intended to secure the continued favor of the patron deity toward the community .... The main innovation ... is that these stones are not simply deposited before the deity but become an integral piece of the high priest's clothes. This means, in turn, that the donation of these stones is only effective through the agency of the high priest: it is Aaron who, by wearing these stones before the deity, secures a *zikkārôn* for the Israelite tribes inside the sanctuary, and thereby mediates the deity's favor for them." They add that the "the high priest, is characterized as the authorized agent of the whole Israelite community, acting on their behalf before the deity." This explanation fits the biblical details better, but these explanations are inherently speculative.

In Egypt, Mesopotamia, and the Roman Empire,[6] gemstones were widely used in magic and medicine. In the thought of these cultures, stones and other substances were viewed as infused with spiritual properties. A gemstone associated with a particular god would have certain talismanic properties. This thinking was largely based on the chemical and visual properties of different mineral substances.[7] This view is anathema to the theology of the Hebrew Bible, and is entirely rejected therein. To the biblical authors, stones (and plants) were spiritually inert substances, best illustrated through the Bible's rhetoric against idolatry.

אֱלֹהִים מַעֲשֵׂה יְדֵי אָדָם עֵץ וָאֶבֶן אֲשֶׁר לֹא־יִרְאוּן וְלֹא יִשְׁמְעוּן וְלֹא יֹאכְלוּן וְלֹא יְרִיחֻן׃

> ... gods of wood and stone, made by human hands, that cannot see or hear or eat or smell.

Within the biblical worldview, the one God, who created everything, did not breathe spiritual properties into select favorite gemstones. Stones may have dazzling visual properties, plants vital medical qualities, but they lack spiritual attributes. The sacred use of plants (such as biblical hyssop, אֵזוֹב *ēzōḇ*) or

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5   Nihan, Christophe, & Rhyder, Julia. (2018). Aaron's Vestments in Exodus 28 and Priestly Leadership. *Debating Authority: Concepts of Leadership in the Pentateuch and the Former Prophets*, *507*, 45.

6   Michel, Simone. (2005). (Re)interpreting magical gems, ancient and modern. In *Officina magica* (pp. 141–170). Brill.

7   Aufrère, Sydney H., Johnson, Cale, Martelli, Matteo, & Beretta, Marco. (2022). Theory and Concepts: The Mythological Foundation of Chemical Theories in Ancient Civilizations. In *A Cultural History of Chemistry in Antiquity* (pp. 23–50). Bloomsbury.

heavenly descriptions of gemstones (lapis lazuli, see Chapter 7) are artifacts of the ritual culture of the Levant, but without theological significance of their own. This distinction in worldview explains why a belief that gemstones possess magical properties is absent from the Hebrew Bible.

Among the Israelites and later Jews, the situation around magical gemstones became more complex. Without tangenting into a detailed discussion of the role of magic and amulets in the life of your average Roman Jew, references to magical stones are virtually absent from Talmudic literature. Amulets and the like were *tolerated* by religious authorities—not endorsed. But as magical gemstones faded from cultural salience, opposition to the association of the Priestly Breastplate with magical gemstones faded. Midrash Leḳaḥ Ṭov, Geonic literature, and Abraham Maimonides equate the *ḥōšen* with the אוּרִים *ʾŪrīm* and תֻּמִּים *Tummīm*,[8] which appears to be an outgrowth of the belief in magical gemstones.

The אֵפֹד *ʾēp̄ōḏ* (feminine: אֲפֻדָּה *ăpuddā*) was a broader ancient cultural phenomenon that originated in Anatolia, as cognates would suggest. Cognates are found across the Semitic world for אֵפֹד *ʾēp̄ōḏ*, but Hittite *ipantu-* is the only cognate possessing *-nt-*. Because Semitic languages have a strong tendency to assimilate /n/ to adjacent stops, the Semitic forms are clearly derivative from a form with *-nt-*. Thus Hittite *ipantu-* appears to be more original.[9] Unfortunately, the etymology of Hittite *ipantu-* has not yet been demonstrated, as far as I am aware. If an Anatolian or Hattic etymology can be shown for Hittite *ipantu-*, then an Anatolian origin of the אֵפֹד *ʾēp̄ōḏ* can be confirmed.

In the literature, the relationship of the חֹשֶׁן *ḥōšen* to the אֵפֹד *ʾēp̄ōḏ* has been confused. In origin and form, the *ḥōšen* appears to be nothing other than the name of the twelve precious stones which decorate the exterior of the *ʾēp̄ōḏ*. Proof for this assertion may be found within the origin of the term חֹשֶׁן *ḥōšen*. The word חֹשֶׁן *ḥōšen* is quite Semitic, a *u*-segolate noun cognate to Arabic حسن *ḥusn* 'beautiful, handsome'. Though it is a word (and root) restricted to this context, the semantic shift from 'beautiful, handsome' to an object of beauty is straightforward.

Thus, the *ḥōšen* should be understood as beautifying the *ʾēp̄ōḏ*, and what better means than with an ornamentation of precious stones and dyed wool? Whereas the *ʾēp̄ōḏ* is borrowed from an Anatolian language, the חֹשֶׁן *ḥōšen* appears to have originated in Ancient Israel, or at most, based on a Canaan-

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8   Bakon, Shimon. (2015). The Mystery of the Urim Ve-Tummim. *Jewish Bible Quarterly*, *43*(4), 241–246.

9   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 58.

ite precedent which has left no other trace. Unlike with the *ʾēp̄ōḏ*, there are no precedents in Ancient Egypt, Mitanni, Hattusa, or Mesopotamia for the gem-set ornamentation of an *ʾēp̄ōḏ*. Thus the Priestly Breastplate appears to have been ornamental—not magical—as its etymology would indicate.

אֹדֶם *ʾōḏem*—Carnelian

The first stone on the Priestly Breastplate is אֹדֶם *ʾōḏem*. Unfortunately, אֹדֶם *ʾōḏem* is restricted to the context of the Priestly Breastplate, sans the reference in the description of the canopy of Tyre (Ezekiel 28:13). *ʾōḏem* is a *u-segolate* noun formed from the Hebrew root א-ד-ם *ʾ-d-m* 'to be red'. Avineri argued that the *u*-segolate stem generates abstract nouns from adjectives.[1] According to his theory, אֹדֶם *ʾōḏem* would be a specific noun that was concretized from a noun meaning 'redness'. But in many instances of this semantic development, the abstract meaning first appears in Late Hebrew, while the concrete form is present in Classical Hebrew. Indeed, the sense of אֹדֶם *ʾōḏem* as 'redness' is first attested only in Late Hebrew.[2] Consequently, it is far more likely that the *u*-segolate stem in Classical Hebrew is restricted to forming concrete nouns, and אֹדֶם *ʾōḏem* represents '(something that is red)'. Therefore, it can be deduced that אֹדֶם *ʾōḏem* intends a type of red gemstone.

Many modern translations (mis)translate אֹדֶם *ʾōḏem* as ruby (as the word is used in Israeli Hebrew). Rubies are crystals of red corundum (Al_2O_3), which is particularly notable for its hardness (Moh's 9, absolute hardness of 400[3]). Today, gemologists differentiate between rubies and spinels, which are slightly softer (Moh's 7.5–8.0) and have the chemical formula $MgAl_2O_4$. However, ruby and spinel were not differentiated before the 11th century CE.[4] Neither of these stones are viable identifications for אֹדֶם *ʾōḏem*. Ruby and spinel were absent from the Levant in the second millennium BCE, not exported westward from India and Afghanistan until the Roman period. Even during the Roman period, rubies were still extremely rare, and were "probably not known to Greek or Roman writers before [the] early Dark Ages."[5] The absence of rubies may be attributed to their hardness, a property which made them nearly impossible to engrave using the technologies and techniques known in antiquity. The inabil-

1   Fox, Joshua. (2003). *Semitic noun patterns*. Brill. Page 153.
2   Klein, Ernest, & Rabin, Ḥayyim. (1987). *A comprehensive etymological dictionary of the Hebrew language for readers of English*. Carta Jerusalem. Entry: אֹדֶם.
3   Mukherjee, Swapna (2012). *Applied Mineralogy: Applications in Industry and Environment*. Springer Science & Business Media. 373.
4   Rapp, George. (2009). *Archaeomineralogy*. Springer Science & Business Media. 115.
5   Thoresen, L. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

ity to engrave rubies would have reduced their demand relative to perceptively similar gemstones like garnets, which could be shaped into any desired shape. Rubies would not have been exported while more popular products were available for trade.

Despite the paucity of textual attestations, the etymology of אֹדֶם *ʾōḏem* is exceptionally indicative of its meaning. Though no exact cognates exist in other ancient Levantine languages, the derivation of *ʾōḏem* from the Hebrew root א-ד-ם *ʾ-d-m* 'to be red' bears a striking parallel to the derivation of the Akkadian stone *sāmtu* 'carnelian'. Akkadian *sāmtu* (later byforms *sāntu*, *sāndu*) is formed from the Akkadian color term *sāmu* 'red'[6] with the Semitic feminine suffix *-t*. Because *sāmu* 'red' was borrowed from Sumerian, *sāmtu* 'carnelian' must be an innovation in Akkadian. No other Semitic language had direct contact with Sumerian, and Sumerian itself possessed an unrelated word for carnelian, GUG.

Akkadian *sāmtu* was the primary term for carnelian east of Egypt (Ancient Egyptian used the term *ḥrst* 'carnelian'). Transmitted west, *sāmtu* appears in Ugaritic as *šmt* 'carnelian'.[7] The change of Akkadian *s* to Ugaritic *š* indicates that *sāmtu* was borrowed through the Assyrian dialect.[8] The transmission from Assyrian Akkadian into Ugaritic implies that carnelian was transported from Mesopotamia to the west. In its historical context, this is unsurprising. Mesopotamia imported carnelian from its east, most notably from India. In the 3rd and early 2nd millennium BCE, India provided a steady source of carnelian and sardonyx to Mesopotamia, though this source was no longer extant by the late second millennium.[9]

The etymological parallel between Akkadian *sāmtu* and Hebrew אֹדֶם *ʾōḏem* is striking. I am unsure if any other scholar has noticed the parallel derivation from the two language's respective words for 'red', and the implication of a possible relationship. Though a direct genetic relationship is precluded, shared derivation from 'red' is unlikely to be coincidental. Two possible explanations are apparent. Carnelian was an import in every place Semites inhabited. In Ugaritic, Akkadian *sāmtu* became the dominant term for carnelian. Though אֹדֶם *ʾōḏem* is an internal innovation within Hebrew, perhaps the term is a loan translation of Akkadian *sāmtu*. An ancient calque is a charismatic explana-

6   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entries "sāmtu" and "sāmu".

7   del Olmo Lete, Gregorio, & Sanmartín, Joaquín. (2003). *A Dictionary of the Ugaritic Language in the Alphabetic Tradition (2 vols)*. Brill. 831.

8   Mankowski, Paul V. (2000). *Akkadian Loanwords in Biblical Hebrew*. Eisenbrauns. 156.

9   Waele, An De, & Haerinck, Ernie. (2006). Etched (carnelian) beads from northeast and southeast Arabia. *Arabian archaeology and epigraphy*, *17*(1), 31–40.

tion, nevertheless it is difficult to prove. Ancient Egyptian ḥrst 'carnelian' does not derive from the Ancient Egyptian word for 'red' dšr, but ḥrst was later used to mean 'to redden'.[10] The cultural association between the color red and carnelian, as was certainly true of Mesopotamia and Egypt, could have been shared in Israel.

A shared cultural connection between carnelian and redness need not be etymological *per se*. Anthropologically, red is a particularly salient color. This is rooted in evolutionary psychology: red is the color of blood, both of humans and prey species. In Berlin and Kay's basic color term theory, 'red' is the first color term for a language to develop after differentiating 'light' from 'dark'.[11] Medieval Latin even had a specialized term for red sapphires, *rubīnus*. From this word English gets the term *ruby*—no other sapphire color receives its own distinct name. Yet ruby has already been disqualified on the grounds of availability and hardness. The only other two red gemstones available during the biblical period, red jasper and garnet, are positively associated with other Classical Hebrew stones (see Chapter 11 and 17, respectively). Thus carnelian is the only possible identification for אֹדֶם ʾōḏem.

Even medieval Semitic terms for carnelian were derived from the concept of redness. The Aramaic targums translate אֹדֶם ʾōḏem with the term סַמְקָן samḵān (and similar forms), formed from the Aramaic root ס-מ-ק s-m-ḵ 'to be red' with suffix ן-, used to form abstract nouns.[12] However, this form is very late, exclusively attested in the targums. Arabic did not possess a single word for carnelian. In Arabic, the generic عقيق ʿaqīq is used for cryptocrystalline quartzes, and عقيق أحمر ʿaqīq ʾaḥmar (literally, 'red aqiq') connotes carnelian. Whether عقيق أحمر ʿaqīq ʾaḥmar reflects an authentic medieval Arabic term for carnelian is difficult to ascertain. عقيق ʿaqīq is often treated as typically red, other chalcedonies being subvarieties of carnelian.

1   Defining Carnelian

Carnelian is a variety of cryptocrystalline quartz (SiO_2) colored red-orange by iron oxide impurities.[13] While it is evident that אֹדֶם ʾōḏem refers to some sort

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10   https://simondschweitzer.github.io/aed/855858.html.

11   Berlin, Brent, & Kay, Paul. (1991). *Basic color terms: Their universality and evolution.* University of California Press.

12   Gross, Ben-Zion. *The Nominal Patterns* פעלון *and* פעלן *in Biblical and Mishnaic Hebrew.* Academy of the Hebrew Language, 1993.

13   Saminpanya, Seriwat, Saiyasombat, Chatree, Chanlek, Narong, Thammajak, Nirawat,

of carnelian, it is not immediately evident how broad to treat the category of 'carnelian'. Carnelian, loosely speaking, refers to a red cryptocrystalline quartz. This stone is well attested in archeological contexts of the biblical period in Egypt[14] and Mesopotamia,[15] and was evidently quite popular in the ancient world. Within the category of red cryptocrystalline quartzes, English differentiates three subtypes: carnelian (light), sard (dark), and sardonyx (banned with white).

In English, carnelian is used somewhat interchangeably with sard and sardonyx, although the three terms technically refer to phenotypically different stones. Sard and carnelian are supposed to be solid colored, with carnelian lighter in color than sard. Sardonyx is supposed to have bands of white interspaced between bands of red. I say "supposed", because the mineral trade and academic literature use carnelian, sard, and sardonyx loosely. This finds an ancient parallel in the interchange between σάρδιον *sardion* and σαρδόνυξ *sardonyx* in Greek/Latin renderings of אֹדֶם *ōḏem*. It is important to ask whether Classical Hebrew would have given separate names to carnelian, sard, and sardonyx, or treated them as subvarieties of a single stone. While textual proof is unavailable given the limited Classical Hebrew corpus, comparison with other ancient languages could hint at how ancient peoples conceived of carnelian as a category.

The Septuagint and its derived sources differ slightly in their translations of *ōḏem*, translating the stone as either σάρδιον *sardion* or σαρδόνυξ *sardonyx*,[16] which have slightly different meanings. Theophrastus describes sard and carnelian under the terms "male and female σάρδιον", respectively: τοῦ γὰρ σαρδίον τὸ μὲν διαφανὲς ἐρυθρότερον δὲ καλεῖται θῆλυ, τὸ δὲ διαφανὲς μὲν μελάντερον δὲ [καὶ] 22ἄρσεν. ("For one type of *sardion*, which is translucent and of a redder color, is called the female, and the other, which is translucent and darker, is called the male.")[17] Σαρδόνυξ *sardonyx* refers to the same stone as English *sar-*

Sirisurawong, Ekkasit, Viriyasunsakun, Rattanavalee, Kingkanlaya, Phusuda & Rakponramuang, Patcharin. (2020). Trace elements content and cause of color in ancient treated carnelian and its natural counterpart from SE Asia. *Archaeological and Anthropological Sciences*, *12*, 1–11.

14   Hussein, Angela Murokh. (2010). Beware of the Red-Eyed Horus: The Significance of Carnelian in Egyptian Royal Jewelry. *Perspectives on Ancient Egypt—Studies in honor of Edward Brovarski* (*Hawass, Z., Der Manuelian, P. & Hussein, RB, Eds.*), 185–190.

15   Bowden, Alison. (1991). *The Use of Carnelian in Ancient Mesopotamia and Possibilities for Determining Its Provenance* (Doctoral dissertation, UCL, Institute of Archaeology).

16   Septuagint σάρδιον, Josephus' Antiquities of the Jews σαρδόνυξ, Josephus' Jewish War σάρδιον, Vulgate *lapis sadius*.

17   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction,*

donyx, a red chalcedony (carnelian) banded with white. As Pliny describes in his *Natural History*: *Sardonyches olim, sicut ex ipso nomine apparet, intellegebantur candore in sarda, hoc est veluti carne ungui hominis inposita, et utroque tralucido.* ("*Sardonyx*, as the name itself indicates, was formerly understood as a *sarda* [carnelian/sard] with a white ground beneath it, like the flesh beneath the human finger-nail; both parts of the stone being equally transparent").[18]

Akkadian-speakers were cognizant of the many varieties of carnelian. Several types of carnelian are named and described in *Abnu Šikinšu*, which survives in fragments (adapted from *The Meaning of Color in Ancient Mesopotamia*[19]):

> NA₄ GAR-*šú* GIM *ed-de-ti* ⁿᴬ⁴GUG MU.NI
> NA₄ GUG BABBAR *tak-pat* ⁿᴬ⁴GUG me-luḫ-ḫa MU.NI NA₄ GUG GAZIˢᴬᴿ
>   *tak-pat* NA₄GUG.GAZIˢᴬᴿ MU.NI
> NA₄ GUG GE₆ *tak-pat* ⁿᴬ⁴GUG.GAZIˢᴬᴿ MU.NI
> NA₄ GUG SIG₇ *tak-pat* ⁿᴬ⁴GUG *mar-ḫa-ši* MU.NI
> NA₄ ⌜GUG⌝ Z[Ú *t*]*ak-p*[*at*] ⁿᴬ⁴⌜GUG⌝ ⌜ZÚ⌝ [M]U.[NI]

> 'The stone whose appearance is like boxthorn(-fruit), its name is carnelian.'
> 'Carnelian (with) white speckles, its name is Meluḫḫa carnelian.'
> 'Carnelian (with) safflower(-colored) speckles, its name safflower-carnelian.'
> 'Carnelian (with) dark/black speckles, its name is safflower-carnelian.'
> 'Carnelian (with) yellow speckles, its name Marḫaši-carnelian.'
> 'Carnelian (with) transparent-speckles, its name is ṣurrānītu.'

The differently 'speckled' carnelians are named for a quality plus a modifier, such as a toponym (Meluḫḫa, Marḫaši) or plant (safflower). The carnelian variety *ṣurrānītu* is simply a concretized adjective from *ṣurru*, whose contextual meaning is hard to discern (see Chapter 18 צֹר *Ṣōr* & חַלָּמִישׁ *Ḥallāmīš*). Nevertheless, *ṣurrānītu* is short for '*ṣurrānītu* carnelian'. The same must be true of Akkadian *luludānītu*, as *Abnu Šikinšu* describes it as "the stone whose appearance is red, covered with white and black patches is named (of) *luludānītu*

    Greek text, English translation, and commentary. The Ohio State University Press. Section 30.

18   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 23.

19   Thavapalan, Shiyanthi. (2019). *The Meaning of Color in Ancient Mesopotamia*. Brill. 145.

TABLE 2   Terms for 'carnelian' in select ancient languages

	Carnelian Solid red chalcedony	Sard Solid dark red chalcedony	Sardonyx Red and white chalcedony, perhaps with black
Akkadian	*sāmtu*	*sāmtu*(?)	ᴺᴬ⁴GUG me-luḫ-ḫa 'Meluḫḫan (Indian) carnelian' *luludānītu*
Egyptian	*ḥrst* 'carnelian'	*ḥrst dšr* 'red carnelian'	*ḥrst ḥḏ* 'white carnelian'
Greek	σάρδιον θῆλυ *sardion thelu* 'female carnelian'	σάρδιον ἄρσεν *sardion arsen* 'male carnelian'	σαρδόνυξ *sardonyx* 'onyx carnelian'
Latin	*sarda, sardius* (borrowed from Greek)	*sarda, sardius* (borrowed from Greek)	*sardonyx* (borrowed from Greek)

stone."[20] The only stone that fits this description is a red, white, and black chalcedony such as a sardonyx, but which lacuna **luludum* reflects remains a mystery (perhaps another toponym?). No separate term for 'sard' is discernible from the Akkadian corpus. Like Greek, the Akkadian term(s) for sardonyx also appears to be the term for carnelian plus a modifier.

Ancient Egyptian provides a more straightforward system of classification. Harris[21] demonstrated conclusively that the term *ḥrst* referred to *carnelian*. He interprets *ḥrst dšr* (literally, 'red carnelian') as referring to sard, which seems plausible. On the other hand, he interprets *ḥrst ḥḏ* (literally, 'white carnelian') as light-colored carnelian, which does not seem as reasonable. Rather, *ḥrst* 'carnelian' with *ḥḏ* 'white'—sardonyx—would seem to be a better fit.

Carnelian, sard, and sardonyx are used loosely in English, and were subsumed categorically in Akkadian and Egyptian. In Akkadian, Greek, and Latin, these varieties of carnelian are differentiated by appending a qualifier onto the generic term. Thus it is unlikely that Hebrew gave wholly different names to 'darker' and 'lighter' carnelian ('sard' versus 'carnelian') or carnelian banded with white ('sardonyx'). More likely, Hebrew may have differentiated between these varieties by adding a modifier to the base term for carnelian. Hence, אֹדֶם *ʾōḏem* encompassed carnelian, sard, and sardonyx.

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20   Horowitz, Wayne. (1998). *Mesopotamian Cosmic Geography* (Vol. 8). Eisenbrauns. 10.

21   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 120–121.

Carnelian mines were scarce in the ancient world. Egypt was a source of carnelian for Israel, as it was for other gemstones. Only one known mine in the environs of Egypt produced any carnelian; the Stela Ridge mine in Nubia dating to the Middle Kingdom. The Stela Ridge mine produces orange carnelians, far from the ideal color. Occasionally, an attractive colored pebble of chalcedony may be found in the Nile river gravels, but this is not a regular source of carnelian. A more fruitful supply of carnelian in Egypt may have been created by manipulating the color of non-precious chalcedonies. Nile river pebbles are composed of a high proportion of brownish chalcedonies, which may be heat treated to redden their color. Heat-treating chalcedonies to redden them is an ancient process practiced India to this day, so it is reasonable to suggest that the same process could have been performed in Egypt.[22] A carnelian bead typical of the mid-3rd millennium BCE recovered in Jordan was shown to have been heat treated to improve its color.[23]

If אֹדֶם *'ōḏem* is indeed calqued from Akkadian *sāmtu*, Israel must have received carnelian from Mesopotamia, though no carnelian originated in that area specifically. Mesopotamia imported carnelian from Iran and India, a trade recorded in texts and attested artifactually.[24] Iranian carnelian is naturally red, whereas Indian carnelian is heat-treated to achieve its attractive coloration. Ultimately, whether Late Bronze Age and Iron Age Israel received its carnelian from Egypt, Mesopotamia, or both cannot be determined based on the existing evidence. Testing of artifacts will be required to clarify the source(s) of the carnelian Ancient Israel possessed.

Proportional to references to carnelian in texts and carnelian artifacts from Egypt and Mesopotamia, there is a paucity of biblical references to אֹדֶם *'ōḏem*. This may have to do with geography and culture. Carnelian may not have been as fashionable in Ancient Israel as it was in Egypt or Mesopotamia. Carnelian required importation from Egypt or Mesopotamia into Israel. If carnelian was not in vogue in Israel, the cost of goods plus importation would not have justified trade when carnelian would fetch a higher price outside of Israel.

אֹדֶם *'ōḏem* appears to be an innovation within Hebrew, making precise identification difficult based on the limited textual evidence. Parallel semantic

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22 Harrell, James A. (2024). *Archaeology and Geology of Ancient Egyptian Stones*. Archaeopress.

23 Nigro, Lorenzo, Gallo, Elisabetta, Gharib, Romeel, Mura, Francesco, Macrì, Michele, & Rinaldi, Teresa. (2020). An Egyptian Green Schist Palette and an Amazonite Gemstone From the "Palace of the Copper Axes" at Batrawy, Jordan. *Vicino Oriente*, 24, 1–26.

24 Potts, Timothy F. (1993). Patterns of trade in third-millennium BC Mesopotamia and Iran. *World Archaeology*, *24*(3), 379–402.

development to the Akkadian term *sāmtu* strongly suggests that אֹדֶם *ʾōḏem* referred to carnelian. Because Akkadian and Greek viewed sard and sardonyx as subvarieties of carnelian, אֹדֶם *ʾōḏem* was probably broad enough to encompass carnelian, sard, and sardonyx. The immediate source of Israel's carnelian is unclear. Etymological considerations point to Mesopotamian intermediaries who received carnelian from Iran and India, whereas historical considerations point towards Egypt.

פִּטְדָה *Piṭḏā*—Peridot

פִּטְדָה *piṭḏā* is the second member of the Priestly Breastplate and certainly one of the more interesting stones on it. A geographical identification combined with a late cognate indicates a solid yet charismatic identification. It is otherwise absent from Classical Hebrew literature sans the very helpful reference in Job 28:19, where the reader is informed that פִּטְדָה *piṭḏā* was acquired from Nubia. This verse applies the expected construct form *piṭḏaṯ*:

<div dir="rtl">

לֹא־יַעַרְכֶנָּה פִּטְדַת־כּוּשׁ בְּכֶתֶם טָהוֹר לֹא תְסֻלֶּה׃

</div>

> *Piṭḏā* from Nubia cannot match its value, pure gold cannot be weighed against it.

Piṭḏā displays two morphological characteristics that hint to its etymology. It is often suggested that *piṭḏā* is a loanword from a non-Semitic language, because the sequence *-ṭḏ-*[1] violates Proto-Semitic phonotactics by employing successive dental stops.[2] Theoretically, the same phonotactic restriction would apply to other Afroasiatic languages (where similar consonants are not permitted in succession), such as Ancient Egyptian. However, *piṭḏā* could be borrowed from an Egyptian word with Egyptian ⟨ḏ⟩ as one of the dentals, because Egyptian ⟨ḏ⟩ did not shift to a dental stop until the New Kingdom. Despite being an affricate like /ʧʼ/ in the Old Kingdom, ⟨ḏ⟩ was still rendered ⟨ט⟩ in select borrowings into Northwest Semitic, such as Egyptian *ḏbʿt* 'ring' → Hebrew טַבַּעַת *ṭabbaʕaṯ* (**ṭʼabbaʕt-*).[3]

If פִּטְדָה *piṭḏā* does represent an Egyptian borrowing, it must have been borrowed during the Old Kingdom and not after, as indicated by the presence of the nominative feminine suffix *ā*, a reflex of **-at*. Egyptian *-t* (probably *-at*) shifted to *-a* in the Middle Kingdom, and *-i* by the New Kingdom.[4] Word-final short vowels *-a*, *-i*, and *-u* were used as case endings in Semitic,

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1 Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. 33.

2 Greenberg, J.H. (1950). The patterning of root morphemes in Semitic. *Word*, 6(2), 162–181.

3 Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 109–110.

4 Noonan, Benjamin J. (2016). Egyptian Loanword as Evidence for the Authenticity of the Exo-

but were lost in Hebrew. Thus, the Middle and New Kingdom reflexes of the Egyptian feminine ending would have been zeroed in Hebrew. By the retention or loss of the feminine ending, the age of an Egyptian loanword may be dated.[5] The first vowel appears to be a case of Suchard's Law in action, the dissimilation of $*u > i$ in the vicinity of a labial consonant.[6] The second dental ⟨ד⟩ is spirantized despite immediately following another consonant. This phenomenon, known as a *shewa*-medium, suggests that historically, there was a short vowel (represented here by ⟨V⟩), that became lost in some sequence like:

$$*pu\underline{t}Vdat > *pu\underline{t}Vd\bar{a} > *pi\underline{t}Vd\bar{a} > *pi\underline{t}\partial\bar{a} > pi\underline{t}\underline{d}\bar{a}$$

By the 11th century CE, the pharyngealization of ט /tˁ/ had spread to the ד in the reading tradition of some expert readers, such that the word was pronounced [pitˁˈðˁɔː].[7]

1   False Etymologies

Some scholars[8] connected פִּטְדָה *pi\underline{t}\underline{d}\bar{a}* with the Assyrian Akkadian term *ḫipindu* 'a stone bead'.[9] However, *ḫipindu* scarcely resembles *pi\underline{t}\underline{d}\bar{a}* morphologically, so there is no reason to assume any relationship between the two. Yehoshua Grintz proposed that *pi\underline{t}\underline{d}\bar{a}* was borrowed from an Egyptian word of the form ****pddt*,[10] though such a theoretical form is totally unattested in the Egyptian

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    dus and Wilderness Traditions. *"Did I Not Bring Israel Out of Egypt?" Biblical, Archaeological, and Egyptological Perspectives on the Exodus Narrative*, 49–67.

5   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 304–305.

6   Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019. 82–83.

7   Khan, Geoffrey. (2020). *The Tiberian Pronunciation Tradition of Biblical Hebrew, Volume 1*. Open Book Publishers. 160–161.

8   The *Jewish Encyclopedia* article on "Gems" specifies "modern scholars", which must refer to certain unnamed German scholars over a century ago. jewishencyclopedia.com/articles/14060-stones-precious. Accessed 13 August 2023.

9   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *ḫipindu*.

10   גרינץ, י. מ. (1975). ל"מונחים קדומים בתורת כוהנים". לשוננו: כתב-עת לחקר הלשון העברית והתחומים הסמוכים לה, (ב), 8, 155–158.
    Grintz, Yehoshua M. (1975). For "Ancient Terms in Leviticus". *Lěšonénu: A Journal for the Study of the Hebrew Language and Cognate Subjects*. Vol. 40, No. 2. 155–158. [Hebrew].

corpus. Though a borrowing from an unattested Egyptian word cannot be ruled out, without any evidence to the affirmative, it is better to look for a superior etymology.

Harrell, Hoffmeier, and Williams[11] suggested a creative Egyptian etymology for *piṭḏā*. The authors note the existence of the lithonym *didi* 'red hematite' in the dictionaries, and suggested that a supposed ancestral form **ddt* could have been prefixed with the Egyptian definite article *p3-* to arrive at the Hebrew word פִּטְדָה *piṭḏā*. However, this etymology is built on a misunderstanding of the Ancient Egyptian word *didi*, a casualty of inconsistency in the transliteration systems used by Egyptologists. Noonan[12] points out that *didi* is not a *vocalized transliteration* but a *transcription of the consonants*. In a more modern transliteration scheme, *didi* is better rendered *dydy* (with the attested variants *ḏḏy*, *ḏḏyt*, *ḏḏyty*, *ḏḏyw*, *dydyt*).[13]

The context in which *dydy* is used indicates an identification with soft red hematite, suitable for making red ochre.[14] The properties of red hematite that is suitable for making red ochre would be entirely unsuitable for use as a gemstone. Red ochre is made from hematite that can be easily pounded into a soft powder, whereas hardness is necessary in a precious stone. Even hard red hematite was never treated as a gemstone. Therefore, Harrell et al. are forced to identify פִּטְדָה *piṭḏā* as a "sub-metallic variety of hematite", though it is not at all obvious that ancient people would designate sub-metallic hematite by the same term as red ochre. The two forms of hematite possess very different physical properties, despite sharing a chemical composition. This identification must be rejected on etymological and semantic grounds alike.

More recently, Meyers[15] suggested that "[t]he Hebrew *piṭḏāh* [*sic*] seems to be an Egyptian word with *p* [*sic*] being the article "the" and *dd* [*sic*] meaning pillar". While the semantics aren't entirely coherent, there may be something to this etymology. The better interpretation of the second element is that of the green *ḏd* amulet, symbolizing the *ḏd-pillar*, which derives from *ḏdy* 'to be

11   Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research, 27*(1), 1–52.

12   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. Page 175, footnote 484.

13   Thesaurus Linguae Aegyptiae, entry "djdj". https://aaew.bbaw.de/tla/servlet/GetWcnDetails?u=guest&f=0&l=0&wn=177900&db=0.

14   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 155–157.

15   Meyers, Stephen C (2021). *Gemstones of Aaron's Breastplate and the Urim & Thummim.*

stable, enduring'.[16] Because Hebrew פִּטְדָה *piṭdā* is suffixed with the nominative feminine suffix -*ā*, it would have to have been borrowed in the Old Kingdom before the feminine suffix in Egyptian was reduced to a short vowel OK -*at* > MK -*a*. Even though *p3-* is first attested in the New Kingdom, it existed in the vernacular of the late Old Kingdom.[17] But there is incongruence in the gender of the theoretical elements of this word. The second element *ḏdt* is feminine, whereas *p3-* is the masculine definite article (contrast with the feminine definite article *t3-*). The masculine definite article *p3-* doesn't match *ḏdt* grammatically.

The traditional etymology of פִּטְדָה *piṭdā* in the older academic literature derives *piṭdā* from the Sanskrit पीत *pīta* 'yellow', drawing a genetic relationship with τοπάζιον *topazion*, the Septuagint's translation of פִּטְדָה *piṭdā*. It is difficult to believe that פִּטְדָה *piṭdā* derives from Sanskrit, because it doesn't follow that a Nubian stone would possess a Sanskrit name. All Sanskrit loanwords in Classical Hebrew are late and were mediated through an Iranian language.[18] The derivation from Sanskrit पीत *pīta* 'yellow' must be rejected prima facie. However, the connection with τοπάζιον *topazion* looks more promising.

2   Reexamining an Old Connection

Despite being frequently mentioned in the older dictionaries, a connection between Hebrew פִּטְדָה *piṭdā* and Greek τοπάζιον *topazion* (τόπαζος *topazos*, τόπᾰζον *topazon*) has not received a fair hearing. At first glance, these words bear only a passing similarity. However, a comparison between a reconstructed protoform of Hebrew *piṭdā* and Greek τοπάζιον *topazion* reveal that the two words are more similar than first appears. We have established that *piṭdā* must be reconstructed as *puṭVdat. After chopping off the nominal suffix and precisely transliterating ζ as /zd/,[19] the Greek stem *topazd-* resembles *puṭVdat; albeit with metathesis and minor vowel discrepancies (note that [o] in Greek

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16   McKeown, Jennifer. (2002). The symbolism of the Djed-pillar in *The Tale of King Khufu and the Magicians*. *Trabajos de Egiptología= Papers on Ancient Egypt*, (1), 55–68.

17   Satzinger, Helmut. (1988). Reading Late Egyptian. *Revue Roumaine d'Egyptologie*, (2–3), 1989.
         Edel, Elmar. (1956, 1964). Altägyptische Grammatik. §194.

18   Powels, Sylvia. (1992). Indische Lehnwörter in der Bibel. *Zeitschrift für Althebraistik*, *5*(2), 186–186.

19   Hinge, George. (2006). *Die Sprache Alkmans: Textgeschichte und Sprachgeschichte* (Vol. 24). Reichert Verlag.

was often used to render foreign /u/). The Septuagint translates פִּטְדָה *piṭdā* with Greek τοπάζιον *topazion*, lending credence to the hypothesis that the two words are related.

A brief survey of early Greek references to τοπάζιον *topazion* is appropriate. Although τοπάζιον *topazion* is referred to by more generic terms in earlier literature (as will be discussed later), the first attested use of the term τοπάζιον *topazion* is in Agatharchides of Knidos in the 2nd century BCE, therefore this term must have been borrowed into Greek around the same time. The classics are unambiguous that τοπάζιον *topazion* originated on an island that went under many names. *Topazos* is one, a name which certainly must be related to τοπάζιον *topazion*, but whether the island gave its name to the stone or the stone to the island cannot be determined on morphological grounds.

Citing Juba, Pliny[20] states that *Topazos* derives from a "Trogodytic" word meaning 'to search': *topazin enim Trogodytarum lingua significationem habere quaerendi*—"*topaz* means 'to search' (*habere quaerendi*) in the language of the *Trogodytae*". Pliny's etymologies are generally questionable, so a healthy skepticism towards this claim is advisable. *Trogodytae* refers to an African people native to the southern Red Sea, perhaps the Beja specifically.[21] According to Pliny's etymology, the donor language of Greek τοπάζιον *topazion* and thus also Hebrew פִּטְדָה *piṭdā* should be identified with a native African language. Four languages are known from ancient Nubia: Egyptian, Cushitic (Medjay, Blemmyes), Meroitic, and Nubian.[22] These may be divided by genetic affiliation into Afro-Asiatic and Eastern Sudanic (a branch of the polyphyletic superfamily "Nilo-Saharan"). Phonotactic limitations involving the double-dental in פִּטְדָה *piṭdā* disqualifies Afro-Asiatic languages from consideration, and thus excludes Egyptian and Cushitic. This leaves Meroitic or Nubian, members of the Eastern Sudanic phylum, as the viable candidates for the donor language.

Along these lines, Wainwright[23] offered a long-forgotten etymology for τοπάζιον *topazion*, which attempts to relate it to the Old Nubian verb ⲧⲟⲡⲁⲉⲓ *topaei*:

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20   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 32.

21   Cooper, Julien. (2022). Children of the Desert Indigenes of the Eastern Desert in the Pharaonic Period and the *longue durée* of Desert Nomadism. In *Blemmyes: New Documents and New Perspectives*. ISD LLC. 37–38.

22   Rilly, Claude. (2019). Languages of ancient Nubia. In *Handbook of Ancient Nubia* (pp. 129–152). De Gruyter.

23   Wainwright, Gerald A. (1946). Zeberged: the Shipwrecked Sailor's Island. *The Journal of Egyptian Archaeology*, *32*(1), 31–38. Footnote 1.

The name originates in the Nubian verb *tabe*, which does mean 'to seek' (Schäfer in ᴢÄs, xxxiii (1895), 100), which with the ending *-sun* added gives *tabe-sun* 'thou soughtest' (*Brugsch, Die biblischen Sieben Jahre der Hungersnoth*, p. 105 note, reprinted by Schäfer in ᴢÄs, xxxiv (1896), 92). Mr. G.W. Murray (An English-Nubian Comparative Dictionary, p. xxxix) shows that in Old Nubian the form was not *-sun* but *-sin*, which is still nearer to topazin and represents not only the 2nd person singular but the 1st person also and the 1st person plural as well. Hence *tabe-sin* meant 'I, thou, or we sought'. These Troglodytes, at any rate, are thus shown to have been Nubians. Curiously enough, the Greek word τοπάζειν means something similar, i.e. 'to aim at, guess, divine'.

The Greek ending -ιον is not original to the word as demonstrated by its absence in its Hebrew cognate. Likewise, a pronoun 'I, thou, or we sought' is inappropriate as an element in a noun. Whether the ancestor of the Old Nubian verb ⲧⲟⲡⲁⲉⲓ *topaei* is the stem of the donor of Hebrew פִּטְדָה *piṭdā* and Greek τοπά-ζιον *topazion* is hard to say. Browne suggested that Old Nubian ⲧⲟⲡⲁⲉⲓ may be borrowed from Arabic تبع *tabiʕa* 'to follow',[24] but this may be chronologically problematic.

Haddad and Cooper[25] offer a pair of explanations for Pliny's etymology that do not require recourse to potentially anachronistic Nubian terminology. Pliny claims that he takes his explanation from Juba, who wrote his now lost works in Greek. They suggest that it may be a "a garbled translation or a folk-etymology, as there is a Greek verb τοπάζειν *topazein* "to divine, guess" which has very similar semantics of 'to seek'" or that τοπάζειν *topazein* was simply a Greek gloss of "the indigenous Trogodytic word which was presumably in Juba's text." But neither of these explanations can account for the cognate in Hebrew פִּטְדָה *piṭdā*, or the form of the indigenous Trogodytic word. Despite finding a clear cognate in Greek τοπάζιον *topazion*, the etymology of the pair of words remains obscure.

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24   Cooper, Julien. (2022). Children of the Desert Indigenes of the Eastern Desert in the Pharaonic Period and the *longue durée* of Desert Nomadism. In *Blemmyes: New Documents and New Perspectives*. ɪsᴅ ʟʟᴄ. Footnote 194.

25   Cooper, Julien. (2022). Children of the Desert Indigenes of the Eastern Desert in the Pharaonic Period and the *longue durée* of Desert Nomadism. In *Blemmyes: New Documents and New Perspectives*. ɪsᴅ ʟʟᴄ. 38 and footnote 195.

3   Identity

The identification of פִּטְדָה *piṭdā* is a more straightforward matter. The morphological similarity between פִּטְדָה *piṭdā* and its Greek translation τοπάζιον *topazion* combined with the shared Nubian/"Trogodytic" provenance establishes a secure cognate. The question thus shifts to the identity of τοπάζιον *topazion*. Many previous assessments of the stones of the Priestly Breastplate erred by misidentifying Greek τοπάζιον *topazion*. Based on the obvious phonological similarity between τοπάζιον *topazion* and *topaz*, they assumed τοπάζιον *topazion* was *topaz*, or even worse, *chrysoberyl*. Topaz was first applied to the stone we know today by J.F. Henckel in his 1737 description of the newly discovered topaz mines in Schneckenstein, Germany entitled *De Topasio vera Saxonum*.[26] Prior to its 1723 discovery, topaz was unknown to humanity. Ditto regarding chrysoberyl. Neither of these stones are viable identifications for the τοπάζιον *topazion* known to the ancients.

In modern archeogemological literature, there is no question as to the identity of τοπάζιον *topazion*. Unlike certain lithonyms in the Greco-Roman gemological lexicon, τοπάζιον *topazion* exclusively refers to a single species of gemstone: *peridot*.[27] Peridot is the gemological term for transparent olivine $((Mg,Fe)_2SiO_4)$. With this connection in mind, a richer picture of associations emerges. The ancient Greek and Roman literature paints a treasure map, a myth, of a desolate island in the Red Sea, which births fresh-oil colored peridots from outcrops on its surface. Agatharchides' *On the Erythrean Sea* describes how the ancients used to harvest the peridot that litters the island's surface:

> At night they traverse the island area by area with bowls of various sizes. By day the stone, overwhelmed by the brightness of the daylight, is invisible among the rocks because of the glare. But when darkness falls, wherever it is, it shines in all directions. When a guard observes one, he covers the gleaming stone with a bowl that matches in size the phenomenon seen by him and serves as a marker. Then, when day comes, he cuts out a circle of rock equal in size to the aforementioned bowl and turns it over to skilled workmen who are able to polish it.[28]

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26   Leithner, H. (2008). The Königskrone Topaz Mine Schneckenstein, Sarony, Germany. *Mineralogical Record*, *39*(5), 355.

27   Thoresen, Lisbet & Harrell, James E. (2014). Archaeogemology of Peridot. *Twelfth Annual Sinkankas Symposium—Peridot and Uncommon Green Gem Minerals*, 31–51.

28   Agatharchides of Knidos. *On the Erythraean Sea*: 5.84a.Translation from: Agatharchides, & Burstein, S.M. (1989). *On the Erythraean Sea* (No. 172). London: Hakluyt Society.

Recalling his 1980 expedition to the island, Gübelin[29] describes this island and its geologic riches in great detail:

> It seems likely that peridots were once found on several parts of the island-in fact, almost everywhere the peridotites outcrop. The finest and largest gem crystals, it is believed, occurred in such quantitities [*sic*] on the eastern slopes of Peridot Hill that mining was worthwhile.
>
> Formerly, however, one could find peridot crystals up to 10 cm long, although those 2–4 cm in length were much more abundant.

More recently, Harrell made an expedition to the island, where he discovered ancient peridot mines. He describes an ancient well dug to provide the miners with fresh water, and recovered pottery shards that could be used to date the settlement.

> Ancient pottery is rare in the mine workings and both ruins, but abundant around the well. All but one of the diagnostic sherds (from the western ruins) came from the well. Although later periods may be represented in the pottery corpus, the several amphorae observed date mainly from the mid-3rd to 1st century BC of the Hellenistic (or Egypt's Ptolemaic) period, with the rest extending into the Roman period, according to ceramics expert Roberta Tomber, who made date attributions on the basis of photographs of the sherds.[30]

This date is impossibly late if peridot is to be identified with פִּטְדָה *piṭdā*. Harrell based his dating on a selection of pottery shards and ancient literary references. Perhaps his late conclusion is merely a product of sampling bias produced from surface finds of diagnostic pottery, or a selection of later sites. His survey only covered half of the island, due to the presence of an Egyptian military base. There may be older evidence to find, or older evidence may have once existed but was destroyed by later inhabitants.

A pair of artifacts may lend support to this conclusion. Sir William Matthew Flinders Petrie discovered a stylistically Middle Kingdom scarab that is now

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29   Gübelin, E. (1981). Zabargad: The ancient peridot island in the Red Sea. *Gems eS Gemology*, *17*(1), 2–8.

30   Harrell, James A. (2014). Discovery of the Red Sea source of Topazos (ancient gem peridot) on Zabargad Island, Egypt. In *Twelfth Annual Sinkankas Symposium—Peridot and Uncommon Green Gem Minerals* (pp. 16–30).

held at the Petrie Museum (UC52076). Notably, this stylistically Middle Kingdom scarab is reported in the literature as a carved peridot. Thoresen and Harrell (2014) erred when they proposed reconsidering the material as "almost certainly serpentine".[31] Upon examining the scarab in person and under different light, Harrell concluded that the scarab is peridot after all. As the design is typical for the Middle Kingdom, the scarab has been dated to that period by experts at the Petrie Museum of Egyptian Archaeology. Dr. Stephen Quirke cautions that this may be a Ptolemaic-Roman reproduction, but I am less convinced that such caution is warranted. Another peridot scarab stylistically similar to Petrie's scarab was recovered from excavations at Berenike. The Berenike scarab was found sitting on fragments of a stela of the Middle Kingdom pharaoh Amenemhat IV at Berenike's Great Temple. At the time, the site served as a waystation for mariners between Egypt and Pwnt.[32]

A puzzling reference in Theophrastus' *On Stones* may be the earliest textual reference to peridot outside biblical literature. Theophrastus mentions a certain ὑαλοειδής *hyaloeides* (literally, "glass-like") stone which is both transparent, remarkably refractive, and used for seals. Eichholz[33] suggests that this may be an early reference to peridot. He points out that in Orphic poetry, τόπαζοι *topazoi* are described as ὑαλοειδέες *hyaloeidees*. He concludes that the yellow-green color of peridot would naturally suggest a relationship to glass (ὕαλος *hyalos*). "It was presumably the green tinge that suggested the likeness to glass. Most Greek and Roman glass had a greenish or a bluish tinge until the secret of purifying it with manganese was discovered".[34] If Eichholz is correct in his interpretation of Theophrastus, then Theophrastus' reference to peridot predates that of Agatharchides of Knidos[35] by two centuries.

A set of eight olivine beads were discovered at the site of Tel Tsaf, dating to the Chalcolithic.[36] While these specimens are far too old to demonstrate anything from the Bronze or Iron Ages ("biblical times"), they do indicate that a

31 Thoresen, Lisbet & Harrell, James E. (2014). Archaeogemology of Peridot. *Twelfth Annual Sinkankas Symposium—Peridot and Uncommon Green Gem Minerals*, 31–51. 41.

32 Harrell, James A. (2023). *Archaeology and Geology of Ancient Egyptian Stones*. Archaeopress.

33 Eichholz, D.E. (1967). Some Mineralogical Problems in Theophrastus' De Lapidibus. *The Classical Quarterly*, 17(1), 103–109.

34 Eichholz, 105.

35 Agatharchides of Knidos. *On the Erythraean Sea*: 5.84.

36 Rosenberg, Danny, Elkayam, Yael, Garfinkel, Yossi, Klimscha, Florian, Vučković, Vesna, & Weiss, Yaakov. (2022). Long-distance trade in the Middle Chalcolithic of the southern Levant: The case of the olivine beads from Tel Tsaf, Jordan Valley, Israel. *Plos one*, 17(8), e0271547.

source of olivine was within reach of Chalcolithic people, and thus to their Bronze or Iron Age successors. Unfortunately, it is unclear what the ultimate source was. While Zabargad is a possibility, the Tel Tsaf beads are no bigger than a centimeter. Tel Tsaf is very close to basalt outcroppings, where olivine forms. While olivine macrocrystals are not known from this basalt, it seems likely that there is a lost olivine source in these basalt flows.

While there is still limited evidence for peridot in the Levant prior to the 4rd century BCE, Petrie's scarab and the Berenike scarab certainly put peridot back on the table as a plausible identification of פִּטְדָה *piṭdā*. That only two peridot artifacts survived in the ruins of this once great civilization implies that there were many more when it was at its zenith. Though it was certainly rare in the second millennium BCE, peridot is the most likely candidate for פִּטְדָה *piṭdā*. The textual data provided in the Bible suggests a stone that originates from Kush, and the ancient translations all point to peridot which originated solely from that locale. Outside of Greek, פִּטְדָה *piṭdā* lacks any known cognates, which is certainly not unexpected given the limited range of peridot prior to the Roman period. As the peridot of the *ḥōšen* must have been a sufficient size to inscribe with the name of a tribe, it was probably what would be considered today the most valuable stone on the *ḥōšen*.

בָּרֶקֶת *Bāreḵeṯ*—Green Jasper

The endeavor to identify בָּרֶקֶת *bāreḵeṯ* is limited by a paucity of attestations in the Hebrew Bible, complimented by a mess within the scholarship pertaining to this word and its cognates. Many of these cognates are unrecognized in the Hebrew dictionaries, though they significantly add to the philological analysis. The underlying form of בָּרֶקֶת *bāreḵeṯ* can be reconstructed on the basis of the Tiberian and Samaritan forms, and is confirmed by an Akkadian borrowing of Hebrew בָּרֶקֶת *bāreḵeṯ*. The Tiberian tradition does not allow /r/ to be geminated, but when Hebrew developed, /r/ could be geminated. The Samaritan vocalization of ברקת as *barrēqət* preserves gemination of ר,[1] and this is supported by the Akkadian borrowing *barraqtu*, which demonstrates that the Hebrew form originally possessed a geminated /r/. When geminated /r/ was lost in Tiberian Hebrew, /a/ was compensatorily lengthened to /a:/[2] in this word.

Ezekiel 28:13 exhibits the unusual variant בָּרְקַת *bārḵaṯ*, which reflects underlying *barrVḵatu. Whereas Masoretic בָּרֶקֶת, Samaritan *barrēqət*, and Akkadian *barraqtu* reflect underlying *barraḵt. Blau[3] suggested that Ezekiel's form reflects a poetic variant of the word, whereas Steiner[4] interprets it as a Phoenician dialectalism. Neither of these explanations can be decisively considered to be correct. Rather, the variant בָּרְקַת appears to reflect a phonological irregularity among cognates, which shall be explored.

1   Medieval Identifications

As with many of the stones on the Priestly Breastplate, בָּרֶקֶת *bāreḵeṯ* has been identified with several dissimilar precious stones. One of the most curious iden-

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1 Stadel, Christian. (2017). Gemination of /r/ in Samaritan Hebrew: a note on phonological diversity in Second Temple Period Hebrew. *Hebrew Studies, 58*, 221–236.

2 Blau, Joshua. (2010). *Phonology and Morphology of Biblical Hebrew: An Introduction*. Winona Lake: Eisenbrauns. Page 82–83.

3 Ibid, 264.

4 Steiner, Richard C. (2012). Vowel syncope and syllable repair processes in Proto-Semitic construct forms: A new reconstruction based on the law of diminishing conditioning. *Language and Nature: papers presented to John Huehnergard on the Occasion of his 60th Birthday*. University of Chicago. 365–390.

tifications for *bāreḵeth* is with some sort of gemstone which is a third white, and third black, and a third red. This description originates from a Jewish tradition found in *Midrash Rabba Numbers*, a work finalized during the Middle Ages, though most of the material is much older. *Midrash Rabba Numbers* 2:7 describes the stones of the Priestly Breastplate as paralleling the flags of the thirteen tribes. For Levi, the flag is described as white, black, and red.

לֵוִי בָּרֶקֶת וּמַפָּה שֶׁלּוֹ צָבוּעַ שְׁלִישׁ לָבָן וּשְׁלִישׁ שָׁחֹר וּשְׁלִישׁ אָדָם וּמְצֻיָּר עָלָיו אוּרִים
וְתֻמִּים:

> *Levi – bāreḵeth*. And his banner is variegated: a third white, a third black, and a third red. And it represents the *ʾŪrīm* and *Tummīm*.

This description was probably created by equating בָּרֶקֶת *bāreḵeṯ* with the phonetically similar but unrelated Arabic *baqarāni*. In al-Hamdānī's *The Antiquities of South Arabia*[5],[6] the author describes *baqarāni* and explains that it was mined in what is now Yemen:[7]

> … the precious *baqarāni*[8] is mined on Mount Anis.[9] It is of different colors, but the three-colored variety, namely that of the red surface with a vein of white over another of black running through it, is very valuable.[10]

> *Dāmigh*[11] lies half way between *Ṣanʿāʾ* and *Dhamār*, and is rich in flowing streams. During the days of Ḥimyar, the *wars* tree (*Memecylon tinctorium*) and all the other fruits flourished in it. In it was also found the precious onyx stone of the *baqarāni* variety, the like of which was found in no other place besides [*Dāmigh*].[12]

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5   Appreciation to my friend Yitz Levi for his assistance in acquiring this book.

6   Faris, Nabih Amin. (2011). *The Antiquities Of South Arabia: Being A Translation From The Arabic With Linguistic, Geographic, And Historic Notes*. United States: Literary Licensing, LLC.

7   The connection between Hebrew *bāreḵeth* and Arabic *baqarāni* was originally developed by David Ben-Abraham, formally published here for the first time.

8   In the manuscripts, B البقران, K and M البقراني.

9   Which is *ʿanis*, in Yemen.

10   Faris, Nabih Amin. (2011). *The Antiquities Of South Arabia: Being A Translation From The Arabic With Linguistic, Geographic, And Historic Notes*. United States: Literary Licensing, LLC. 26–27.

11   Which is *Ḏūrān*, Yemen.

12   Faris, Nabih Amin. (2011). *The Antiquities Of South Arabia: Being A Translation From The*

Baqarāni is rendered in modern Yemeni Arabic as *baqrani*. This is a tri-colored agate that has been rounded into a cabochon so as to resemble an eye. Etymologically, these words appear to be a derivative of Arabic بَقَر *baqar* or Old South Arabian *bqr* 'cattle',[13] in reference to the appearance of bovine eyes. Pliny describes these agates in his *Natural History*.[14] As an aside, manuscripts K and M of *The Antiquities of South Arabia* preserve the variant البقران *al-baqrānī*,[15] reminiscent in form of Onqelos' translation of *bāreḵeth*, בָּרְקָן *barḵān*.

In his *Tafsir*, Rav Saadia Gaon translates *bāreḵeth* as Judeo-Arabic אצפר *ʾaṣfar*, shortened from יאקות אצפר *yāqūt ʾaṣfar* 'yellow sapphire'.[16] This identification is impossible, as sapphires were unavailable prior to the Roman period. It remains an open question as to how the Gaon reached this translation, perhaps it may be a confusion between yellow sapphires and emerald.

1.1   *Problematic Identification with Emerald*

The most popular identification for בָּרֶקֶת *bāreḵeṯ* is *emerald*, but this identification is impossible. Of all the emerald-bearing locales in the world, the only ones in proximity to the Levant are a series of sites in the southern Eastern Desert of Egypt, referred to as *Mons Smaragdos*. These emerald deposits were first exploited no earlier than the Ptolemaic period, based on the material remains at the worker camp at Sikait (ancient Senskis[17]). Recent excavations have securely dated the founding of this settlement to the 3rd century BCE.[18] This accords with the earliest known emerald, a single unengraved

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     Arabic With Linguistic, Geographic, And Historic Notes. United States: Literary Licensing, LLC. 41–42.

13   Biella, Joan Copeland. (1982). *Dictionary of Old South Arabic, Sabaean Dialect*. Brill. 53.

14   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 23.

15   Faris, Nabih Amin. (2011). *The Antiquities Of South Arabia: Being A Translation From The Arabic With Linguistic, Geographic, And Historic Notes*. United States: Literary Licensing, LLC. 26.

16   i Serra, Jordi Ferrer. (2017). Raphelengius and the Yellow Cow (Q 2: 69): Early Translations of Hebrew ʾādōm into Arabic ʾaṣfar. In *Arabic in Context* (pp. 227–270). Brill.

17   de la Vega, Sergio. G.D., Guzmán, J.O., Abella, D.F., & Pita, V.T. (2021). The Emerald Mines of Wadi Sikait (Egypt) from a Diachronic Perspective. Results of the 2020 and 2021 Seasons of the Sikait Project. *Trabajos de Egiptología= Papers on Ancient Egypt*, (12), 19–48.

18   Guzmán, Joan Oller, et al. (2021). New evidence regarding Emerald Production in Roman Egypt at Wadi Sikait (Eastern Desert). *Journal of Near Eastern Studies*, 80(1), 123–142.

stone mounted in a gold ring, part of the Ganymede hoard dated circa 330–300 BCE.[19] The 3rd century BCE is far too late for emeralds to appear in Exodus and Ezekiel.

The misidentification of בָּרֶקֶת *bāreḵeṯ* with emerald is based on the Septuagint's translation when בָּרֶקֶת *bāreḵeṯ* appears on the Priestly Breastplate by σμάραγδος *smaragdos*, which did include emerald. However, σμάραγδος *smaragdos* encompassed a broader range of precious stones than just emeralds. Instead of classifying stones by chemical and crystal structure, the ancients employed color, clarity and providence. Pliny[20] describes twelve varieties of σμάραγδος *smaragdos*. Some of Pliny's *smaragdoi* are recognizably emerald-like, but others are described as occurring in copper-mines. Copper ores are generally green in color, and several species such as malachite and azurite are readily mappable onto some of Pliny's *smaragdoi*.

2   Previous Etymologies

In academic literature since Lewy,[21] בָּרֶקֶת *bāreḵeṯ* is normally presented as cognate with Greek σμάραγδος *smaragdos* and Sanskrit मरकत *marakata*, all three of which bear a phonological resemblance. As mentioned, σμάραγδος *smaragdos* is used to translate בָּרֶקֶת *bāreḵeṯ* in the Septuagint. While in older literature the relationship between मरकत *marakata* and σμάραγδος *smaragdos* was assumed to be Sanskrit > Greek, more recent literature reverses the directionality to Greek > Sanskrit, finding that the Greek loan must have entered Sanskrit with the *terminus ad quem* being Alexander the Great's invasion of India in 327 BCE.[22] This date must be pushed forward by another century because Egyptian emeralds only began to be mined in the 3rd century BCE at the earliest, and it is difficult to believe that the Indians would have applied a foreign term to a native stone. The discovery of emeralds in India must have occurred after this date. As a loan from Greek, consideration of the Sanskrit term can be safely put aside.

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19   Thoresen, L. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

20   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapters 16–19.

21   Lewy, Heinrich. (1895). *Die semitischen Fremdwörter im Griechischen*. R. Gaertner.

22   Wojtilla, Gyula. (2012). Contributions to the cultural history of emerald in early India. *Acta Orientalia, 65*(4), 463–478.

Most commonly, בָּרֶקֶת *bāreḳeṯ* is etymologized as a Hebrew innovation from בָּרָק *bārāḳ* 'lightning'[23] according to the *qaṭṭal-t* pattern. Symmachus was certainly following this understanding when he translated בָּרֶקֶת *bāreḳeṯ* as κεραύνιος *keraynios* 'of a thunderbolt'. The difficulty with this etymology should be apparent, but perhaps due to semantic contamination from European 'thunderstone' folklore, it has yet to be corrected in the dictionaries. Thunderstones are prehistoric stone points (arrowheads, spear points, axheads, et cetera) reinterpreted by later people as a product of a lightning strike, used as amulets. Thunderstones would not have a place in the list of engraved precious stones on the Priestly Breastplate. Given this semantic difficulty, the secondary meaning of בָּרָק *bārāḳ* 'flash' has been advanced, which is semantically easier for a precious stone. However, no 'flashy' gemstone is a viable candidate for identification with בָּרֶקֶת *bāreḳeṯ*. Emeralds, which might fit the "flashy" description, would not be mined until the 3rd century BCE. Peridot has been securely identified with פִּטְדָה *piṭḏā* in the previous chapter. Green copper ores may be attractive, but they don't sparkle.

The theory that בָּרֶקֶת *bāreḳeṯ* is a Hebrew innovation from בָּרָק *bārāḳ* 'lightning, flash' according to the *qaṭṭal-t* pattern is problematic for several additional reasons:

1. The pattern *qaṭṭal-t* is used in Classical Hebrew to form diseases and abstract substantives,[24] neither of which would be appropriate for a gemstone.

2. The form בָּרְקַת may reflect *barrḳatu*, possessing a triconsonantal cluster, which Hebrew phonotactics does not tolerate.

3. The variation in Hebrew בָּרֶקֶת ~ בָּרְקַת is suggestive of a loanword.

4. The great morphological variation of cognates in other Semitic languages is suggestive of a loanword.

5. Even assuming a loan from another Semitic language, derivation from *baraḳ-* is not *prima facie* reasonable. As already stated, the identification with emerald is problematic, and so a theory connecting lightning/flashing with whatever one chooses to identify בָּרֶקֶת *bāreḳeṯ* with must be developed if a Hebrew etymology is to be maintained.

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23 Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Page 327–328.

24 Huehnergard, John. (2015). Biblical Hebrew nominal patterns. *Epigraphy, Philology, and the Hebrew Bible: Methodological Perspectives on Philological and Comparative Study of the Hebrew Bible in Honor of Jo Ann Hackett*, 25–64.

3   Cognates

Cognates for בָּרֶקֶת *bāreḵeṯ* within other ancient languages have largely been overlooked by scholars treating בָּרֶקֶת *bāreḵeṯ* and σμάραγδος *smaragdos*. Having already established that Sanskrit मरकत *marakata* 'emerald' is a derivative of Greek σμάραγδος *smaragdos*, it is appropriate to now treat the latter.

3.1   *Greek*

The traditional etymology of σμάραγδος *smaragdos* connects the term—correctly in my opinion—with בָּרֶקֶת *bāreḵeṯ*. Beekes[25] reiterates the traditional etymology, and develops it the furthest, so it will be examined here. He notes that the correspondence **b-* > σμ- is found in the Old Persian personal name *Bardiya* > Σμέρδις. He then posits contamination from Greek σμαραγέω *smarageo* meaning "'to drone, roar, thunder', of the sea, thunder, etc." (which I suggest may *actually* derive from Semitic **baraḵ-* 'lightning' vis-a-vis the initial consonant correspondence described above). His contamination hypothesis may be motivated by the otherwise inexplicable voicing of -γδ- and degemination of Hebrew **-rr-*. This etymology is creative, but difficult in light of additional cognates from Minoan and other ancient Levantine languages.

Piquero[26] proposes a provocative non-traditional etymology for σμάραγδος *smaragdos*, motivated by the unexpected Mycenaean form *pa-ra-ku-we*. That σμάραγδος *smaragdos* is attested at Mycenae demonstrates that it was borrowed in Greek no later than the second millennium BCE. He parses this word as σ- + μάραγ + -δος in his proposed etymology:

– The prefix σ- has unknown meaning, but appears in pre-Greek substrate terms.
– A Greek root reconstructable to **μαραχ *marak* ~ βαραχ *barak* means 'green'. He proposes that the root **μαραχ originates from a noun formed from the Semitic root **w-r-ḵ* by passing from Semitic to Minoan to Mycenaean and the other Greek dialects.
– the suffix -δος is used to form technical and expressive terms and is used to form the names of materials (also found in pre-Greek substrate terms such as μόλυβδος 'lead').
– Due to regressive assimilation, the sequence **-χδ-* voiced to -γδ-.

His theory can be improved somewhat. In Greek loanwords from Asian languages that were mediated through Anatolia, **b* was substituted by **sm-* be-

25   Beekes, Robert. (2009). *Etymological dictionary of Greek (2 vols.)*. Brill.

26   Piquero, Juan. (2015). La etimología de σμάραγδος: una nueva propuesta a la luz del micénico. *Kadmos, 54*(1–2), 39–53.

cause Anatolian languages lacked initial voiced stops.[27] If that be the case, Greek σμάραγδος *smaragdos* may have been borrowed from a West Semitic form with *b-*, mediated through Anatolian. The remainder of the word matches בָּרֶקֶת *bāreket* and its cognates quite closely. The alleged suffix -δος is actually the semitic feminine suffix -(*a*)*t* with the Greek *o*-stem nominative suffix -ος, also added after borrowing into Greek. Semitic *-*t* /t/ was voiced to -δ /d/ by voicing assimilation to the preceding voiced stop -γ- /g/.

3.2   *Aramaic*

The Aramaic Targums universally render בָּרֶקֶת *bāreket* with forms derived from a stem *brq-*: Peshita renders ברקא *brqʾ*, Jerusalem Neofiti renders ברקתא *brqtʾ*, Neofiti renders ברקתה *brqth*, Pseudo-Jonathan Numbers renders ברוקא *brwqʾ*, Pseudo-Jonathan Exodus renders ברקתא *brqtʾ*, and Onkelos renders בָּרְקָן *barkān*. The variation in the suffixes corresponds to dialectal differences in Aramaic, which supports the notion that a gemstone *brq-* was a real word in Aramaic. Each of these dialects inherited their word from a common ancestor, not a synthetic "cognate" or a borrowing from Hebrew. The Aramaic Targums preserve a parallel form in their translations of the second stone of the Priestly Breastplate. פִּטְדָה *piṭdā* is translated by Jerusalem Neofiti as ירקתא *yrqtʾ*, Neofiti ירקתה *yrqth*, Pseudo-Jonathan Numbers ירוקא *yrwqʾ*, Pseudo-Jonathan Exodus ירקתא *yrqtʾ*, and Onkelos יַרְקָן *yarkān*, the forms perfectly paralleling the Aramaic translations of בָּרֶקֶת *bāreket* except with *y-* instead of *b-*.

3.3   *Akkadian—Neo-Babylonian*

There is only a single attested instance[28] of Akkadian *barraqtu*[29] (spelled *bar-ra-aq-tu₄* and *ba-ar-raq-tu₄*) in the Akkadian textual corpus:

> *Bêl-aḫ-iddina* and *Bêlshunu*, sons of *Bêl* …, and *Ḫâtin*, son of *Bazûzu*, spoke unto *Bêl-nâdin-shumu*, son of *Murashû*, thus: As concerns the gold ring set with an **barraqtu**, we guarantee that for twenty years the **barraqtu** will not fall out of the gold ring. If the **barraqtu** should fall out of the

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27   Schmitt, Rüdiger. (2011). *Iranische Namen in Nebenüberlieferungen indogermanischer Sprachen: Iranische Personennamen in der griechischen Literatur von Alexander d. Gr. Faszikel 5A*. Verlag der Österreichischen Akademie der Wissenschaften. 333–336.

28   glikman.blogspot.com/2015/07/bareqet-etymology-of-theword.html. Accessed 13 August 2023.

29   Hilprecht, Hilprecht, Hermann Vollrat. (1898). *The Babylonian expedition of the University of Pennsylvania* (Vol. 9). Department of archaeology, University of Pennsylvania. Page 30.

gold ring before the end of twenty years, *Bêl-aḫ-iddina*, *Bêlshunu* (and) *Hâtin* shall pay unto *Bêl-nâdin-shumu* an indemnity of ten mana of silver.[30]

The fact that there is merely a single occurrence of this word in Akkadian suggests a borrowing from West-Semitic. As far as form is concerned, *barraqtu* closely resembles Hebrew בָּרֶקֶת *bāreḵeṯ*, especially its protoform **barraḵt*. Positing a direct borrowing from Hebrew would not be unjustified.

3.4   *Akkadian—Old through Neo-Babylonian*

There is another cognate attested throughout the history of Babylonian Akkadian, which could shed additional light on Hebrew בָּרֶקֶת *bāreḵeṯ*. The Akkadian stone (*w*)*urrīqu* is attested from the Old Babylonian period through the Neo-Babylonian period,[31] and corresponds to the forms attested in other Semitic languages. Kouwenberg believes it to be a substantiation of the intensive adjective (*w*)*arqu* "yellow, green".[32] Regardless, it is an archaic pattern within Akkadian, with few parallels in other Semitic languages. As an Akkadian word, it is semantically equivalent to the Sumerian lithonym ^NA4^SIG₇.SIG₇, and corresponds etymologically: Sumerian SIG₇ indicates the color green.

3.5   *Ancient Egyptian*

There is a single instance of the precious stone *brgt* attested in the surviving Ancient Egyptian corpus, found in the Famine Stele dated to the Ptolemaic kingdom. This text informs us that *brgt* was obtained 'down stream' (north) of Sehel Island, where the stele originates. This disqualifies peridot (which originated upstream at Zabargad), usually and rightly equated with פִּטְדָה *piṭdā* anyway. In consideration of its rarity and late attestation, Aufrere identified *brgt* specifically with emerald because *brgt* survived into Coptic as ⲁⲃⲉⲣⲏⲭ *abərêj*, which allegedly also means 'emerald'[33] (I have not been able to verify the accuracy of this identification). This semantic development is parallel to the same development in Greek σμάραγδος *smaragdos*.

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30   The word 'barraqtu' is underlined in original publication.

31   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry (*w*)*urrīqu*.

32   Kouwenberg, Norbertus Johannes Cornelis. (1997). *Gemination in the Akkadian verb*. Uitgeverij Van Gorcum. 34.

33   Aufrere, Sydney. (1984). Brgt (Stèle de la famine 16). Remarques sur les termes servant à désigner l'émeraude, le béryl et l'olivine. *Revue d'Egyptologie Paris*, *35*, 23–30.

3.6 *Ugaritic*

The Ugaritic term *abn brq* has been interpreted in a number of ways.[34] Marvin H. Pope[35] connected *abn brq* to Hebrew בָּרֶקֶת *bāreḵeṯ*, an interpretation which seems quite plausible, and will be considered in this analysis. If Ugaritic *abn brq* is cognate, which I think is likely, the lack of a fourth consonant is notable.

3.7 *Eblaite*

The evidence from Eblaite—despite being difficult to interpret phonologically—may be the most useful in both formulating an etymology and identifying the stone at issue. Pasquali[36] collected three forms, *wa-ru₁₂-ga-tum, wa-ru₁₂-ga-na-tum* and *wa-ra-ga-tum*, and analyzed their form and uses in Eblaitic texts. Interpreting the sounds behind the syllabic cuneiform is no easy task. Gemination is not reflected in Eblaitic orthography, and signs can represent multiple consonants. For example, *G*-series signs can represent */k/, */g/, or */k'/. Initial *w-* instead of *b-* is unambiguous in the Eblaite reflex. Interchange between ru_{12} and *ra* for the second sign indicates zero vowel following *-r-*. The presence of *na* in some spellings before the feminine suffix indicates *-ntum*, and is reminiscent of certain Aramaic forms. Vowel length cannot be concluded from the data. These forms confirm Piquero's hypothesis regarding the root of the donor of Greek σμάραγδος *smaragdos*, and thus provides a new etymology for Hebrew בָּרֶקֶת *bāreḵeṯ*.

4   A Semitic Etymology

That cognates of בָּרֶקֶת *bāreḵeṯ* are attested in third millennium BCE texts testifies to the antiquity of this word. Taking the list of the cognates together, several patterns emerge:

1. The oldest attested Semitic forms (Eblaite and Old Babylonian Akkadian) preserve *w-*, not *b-*.
2. In Northwest Semitic languages (the branch which includes Hebrew, Aramaic, and Ugaritic), initial *w-* shifted to *y-* (the textbook example being PS **wald-* → Arabic ولد *walad*, Hebrew יֶלֶד *yeleḏ*). In all Northwest Semitic lan-

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34   Fensham, F. Charles. (1959). Thunder-stones in Ugaritic. *Journal of Near Eastern Studies*, *18*(4), 273–274.

35   Pope, Marvin H. (1955). *El in the Ugaritic texts* (No. 2). Brill Archive.

36   Pasquali, Jacopo. (2005). *Il lessico dell'artigianato nei testi di Ebla*. Dipartimento di linguistica, Università di Firenze. 77–81.

guages with cognates of בָּרֶקֶת *bāreḵeṯ* (Hebrew, Ugaritic, and Aramaic), the initial consonant of this word is *b-*. Aramaic also has a secondary form with *y-*, the expected reflex of **w-*. The Neo-Babylonian hapax *barraqtu* is a borrowing from West Semitic.

3. Some languages attest to an infix *-ān*, but this suffix may have either assimilated to the suffix *-(a)t* in other reflexes, or never have been present in the first place. Its presence or absence does not correlate phylogenetically.

4. Some languages attest to a suffix *-(a)t*, but its presence or absence does not correlate phylogenetically.

Because emerald is not a viable identification for any of these cognates prior to the late 1st millennium BCE, derivation from the root *b-r-ḳ* with the meaning of 'to flash' is very difficult. However, if these words are derived from the root *w-r-ḳ* 'yellow-green', there are no difficulties. Of course, this matches Pliny's description of σμάραγδοι, a term which encompasses various kinds of green precious stones. Piquero anticipated that σμάραγδος *smaragdos* was derived from a noun formed from the Semitic root **w-r-ḳ* 'yellow-green'.[37] Even if his reasoning might have been incomplete, his hunch is strongly supported by the Semitic data and is almost certainly correct.

The suffixes among the Semitic reflexes of this word show an odd distribution. Some languages attest to an infix *-ān* and/or the feminine suffix *-(a)t*, distributed in a pattern that does not correlate to the breaking up of the Semitic language family. Both suffixes were probably present in the Proto-Semitic ancestor, but were separately lost in the sub-branches.

Although it is difficult to reconstruct the exact form of this word given the vowel discrepancy in daughter reflexes, we may reconstruct a geminated second radical **-rr-*, the pair of suffixes **-ān* and **-at*, and most importantly, clear derivation from the root **w-r-ḳ* 'green-yellow'. As such, it is clear that the Proto-Semites valued some sort of green stone(s) as precious. Green stone beads are first known in the Levant from the Natufian culture (13,000–11,500 BP), which correlates (and perhaps causates) with the rise of agriculture.[38] The Proto-Semites who appear to descend from this culture were largely agricultural, and so the existence a Proto-Semitic word **wVrrVḳāntum* '(green precious stone)' circa 3750 BCE[39] is unsurprising.

37   Bulakh, Maria. (2006). Basic Color Terms of Biblical Hebrew in Diachronic Aspects. *Babel und Bibel*, *3*, 181–216.

38   Bar-Yosef Mayer, Daniella E. & Porat, Naomi. (2008). Green stone beads at the dawn of agriculture. *Proceedings of the National Academy of Sciences*, *105*(25), 8548–8551.

39   Kitchen, Andrew, Ehret, Christopher, Assefa, Shiferaw, & Mulligan, Connie J. (2009). Baye-

TABLE 3   Suffix-retention in reflexes of Proto-Semitic *wVrrVḵāntum

Language	Form	*-ān	*-(a)t
Hebrew	בָּרֶקֶת *bāreḵeṯ* ~ בָּרְקַת *bārḵaṯ*		✓
Greek	σμάραγδος *smaragdos*		✓
Aramaic	ברקא ברקתא + ירקתא ברקתה + ירקתה ברוקא + ירוקא ברקתא + ירקתא ברקן + ירקן	✓	✓
Neo-Babylonian	*barraqtu*		✓
Ancient Egyptian	Demotic *brgt*, Coptic ⲁⲃⲉⲣⲏⲭ		✓
Akkadian	(*w*)*urrīqu*		
Ugaritic	*brq*		
Eblaite	wa-ru$_{12}$-ga-tum wa-ru$_{12}$-ga-na-tum wa-ra-ga-tum	✓	✓

5   Possible Identities

Prior to the discovery of emeralds in Egypt during the Ptolemaic period, the term σμάραγδος *smaragdos* was applied to other green gemstones. Pre-Ptolemaic references to σμάραγδος *smaragdos* may help to narrow the identity of the archetypical *wVrrVḵāntum* that was loaned into Greek. Evidence from cultic objects may be used to reverse-engineer the identity of this word.

5.1   *Greco-Phoenician Σμάραγδος* Smaragdos *Baetyl*

In Theophrastus' *On Stones*,[40] the author provides several descriptions of σμάραγδος *smaragdos* that are useful in ascertaining to which precious stones this term was applied:

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sian phylogenetic analysis of Semitic languages identifies an Early Bronze Age origin of Semitic in the Near East. *Proceedings of the Royal Society B: Biological Sciences*, 276(1668), 2703–2710

40   All excerpts taken from the translation of: Theophrastus, Caley, E.R., & Richards, J.F. (1956).

... But it is rare and of small size, unless we are to believe the records about the Egyptian kings; for it is said that among the gifts from the king of the Babylonians a smaragdos was once sent to them which was six feet in length and four and a half in width, and that four such stones are deposited as an offering in the obelisk of Zeus.

(25)   The largest of the stones which many call tanoi is the one at Tyre. For there is a large slab in the temple of Herakles, unless this is a false smaragdos, for a species of that kind does exist. The stone occurs in places that are well known and easy to reach, especially in two of them, the copper mines of Cyprus and the island lying off Chalcedon. In the latter, exceptional stones are found. This kind is obtained by mining, like the others, and nature has produced it separately in many veins in Cyprus.

(26)   They are not often found large enough for a seal, but most of them are smaller in size; for this reason the stone is used for soldering gold, since it solders like chrysokolla. And some people even suppose that its nature is the same, for they both happen to be similar in color. But chrysokolla is found in large quantities in gold mines and even more in copper mines, as in the ones near the ... districts.

(27)   But smaragdos is rare, as we have mentioned, for it seems to be formed from iaspis. It is said that a stone was once found in Cyprus half of which was smaragdos and half iaspis, as if it had not yet been entirely changed from the watery state. It takes some work to make it shine, for in its natural condition it is not bright.[41]

In addition, the smaragdos and the iaspis are found in Cyprus.[42]

Based on the extensive descriptions of smaragdoi from different locales and with different properties, scholars have tried to identify the different mineral species categorized under this term. For Theophrastus, emerald was not one of them (although Pliny seems to have misunderstood Theophrastus' *Bactrian smaragdos* as emerald). Thoresen lists green chalcedony (chrysoprase), chrome chalcedony, green jasper, and peridot as probable identifications for Theophrastus' *smaragdoi*.[43] To this, I suggest chalcanthite as the Cyprian σμά-ραγδος *smaragdos*, though it would not likely have survived two millennia of water-exposure.

Theophrastus on stones: Introduction, Greek text, English translation, and commentary. The Ohio State University Press.

41   Ibid, sections 24–27.

42   Ibid, section 35.

43   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and

The references to σμάραγδος *smaragdos* in Herodotus and Theophrastus primarily include references to baetyls (from Latin *baetulus*, from Greek βαίτυλος *baitylos*, from Phoenician *byt ʾl*). Baetyls were large cultic stones placed inside pagan temples across the Mediterranean, and are attested in a Hittite, Minoan, Greek, and Phoenician context. The Phoenician origin of the term in Greek suggests that it is a Phoenician religious concept that was borrowed by the Greeks.

Theophrastus records that the king of the Babylonians once sent the king of Egypt a *smaragdos* that was six feet long and four and a half wide,[44] and that there are four such stones in the 'obelisk of Zeus'. In Greco-Roman times, the Greek god Zeus was equated with the Egyptian god Amun as Zeus-Ammon, and therefore Theophrastus' reference probably refers to the seventeen obelisks at the temple of Amun at Karnak. No baetyl is extant at those ruins today.

In his *Histories*,[45] Herodotus also describes a *smaragdos* pillar at the temple of Heracles (Melqart) at Tyre. This pillar was one of a pair, the other consisting of gold. Theophrastus reiterates Herodotus' claims as well.[46] These baetyls are alluded to in Ezekiel 26:11, which describes their destruction (מַצְּבוֹת *maṣṣəḇōṯ* in Hebrew) by Alexander the Great:[47]

וּמַצְּבוֹת עֻזֵּךְ לָאָרֶץ תֵּרֵד

And your mighty pillars shall crash to the ground.

That baetyls constitute the primary subject of σμάραγδος *smaragdos* in pre-Ptolomaic texts make them of particular importance. Two baetyls have survived that may throw light on the σμάραγδος *smaragdos* described in the early Greek sources. At the center of the temple in the ruins of Ḫattuša is a famous green stone. It is a cube of about 3–4 foot cubed, smooth on top, and made of some sort of beautiful dark green stone, suspected of being serpentinite (per-

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their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

44 Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. Section 24.

45 Book 2, Chapter 44:1–2.

46 Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. Section 25.

47 Saur, Markus. (2010). Ezekiel 26–28 and the History of Tyre. *Scandinavian Journal of the Old Testament*, 24(2), 208–221.

haps bowenite?). Likewise in Crete,[48] a "green serpentine" [*sic*] boulder was found in a context that indicates cultic function. These discoveries fit the profile of the *smaragdos* baetyls described in early Greek sources, even if they cannot be equated with the specific examples mentioned. This leaves some room for some ambiguity in whether or not they are in fact *smaragdoi*, and the descriptions of the geological identity of the stones in the literature leave specifics to be desired. However, the correlation between Theophrastus and Herodotus' descriptions and the archeological findings is strong enough that the evidence is relevant to the discussion.

5.2   *Timna*

Eilatstone is a green-blue heterogeneous mixture of malachite, azurite, turquoise, pseudomalachite, chrysocolla mined at Timna (תִּמְנָע), and is the national stone of the State of Israel. The copper mines at Timna have been mined for six millennia for their copper ore, but just as in modern times, attractive copper salts from Timna were valued as a gemstone. The Temple Mount Sifting Project uncovered rough specimens of eilatstone[49] dating to an unknown period. Interestingly, a term for eilatstone from the Biblical period has not yet been identified, with some speculation that פּוּךְ *pūḵ* may have been used to designate malachite (see Chapter 6.3). Though eilatstone is variable in color depending on its specific mineralogical composition, all examples are characteristically green. Due to the reactivity of these copper minerals, any engraved examples may have dissolved away.

6   Putting the Data Together

It is curious that Egyptian borrowed the term *brgt* for 'emerald' (continued in Coptic ⲁⲃⲉⲣⲏⲭ *abərêj*) from West Semitic, even though emeralds only began to be mined in Egypt (not a Semitic area!) in the 3rd century BCE at the earliest. Why would Egyptian speakers borrow a foreign term for a stone that originated in Egypt? This question is further exacerbated by the fact that Greek *also* borrowed the same West Semitic word as σμάραγδος *smaragdos*, which

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48   MacGillivray, A., & Sackett, H. (2000). The Palaikastro Kouros: the Cretan god as a young man. *British School at Athens Studies*, 165–169.

49   El-Kayam, Y., Amar, Z., Barkay, G., and Dvira, Z. (2016). Semi-Precious Stones from the Temple Mount Sifting Project and Their Significance. *New Studies on Jerusalem* 21. Ramat-Gan: Ingeborg Rennert Center for Jerusalem Studies, 307–319 [Hebrew with English abstract].

speakers applied to an array of green precious stones, eventually including emeralds (after they were discovered, of course). Borrowings have a tendency to be semantically narrower than their etymon. As shown, the earliest application of σμάραγδος *smaragdos* applied to large blocks of green minerals, but their precise mineralogical identities are uncertain.

The etymology of בָּרֶקֶת *bāreḵeṯ* might suggest the answer to these questions. Although the stem is uncertain, the root of the first morpheme has been shown to be *w-r-ḳ* 'yellow-green'. While this could refer to a specific species of green stone, the diversity within the reflexes does not point to a particular species. Rather, its semantic range is comparable to the Chinese *yù* 玉 (jade) and Māori *pounamu* (greenstone), each encompassing several mineral species of green precious stones. During an early stage of the language, perhaps in Proto-Semitic, **wVrrVḳāntu* may have encompassed all green gemstones including turquoise, eilatstone, malachite, green jasper, serpentinite, variscite, and other species. Many of these gemstones would be forked off into their own categories with new terms (both innovative and borrowed) in daughter languages.

This makes it difficult to determine which particular species was referred to by the term בָּרֶקֶת *bāreḵeṯ* on the *ḥōšen*. It is possible to rule out those species which otherwise appear on the *ḥōšen*, namely peridot (פִּטְדָה *piṭdā*), turquoise (נֹפֶךְ *nōp̄eḵ*), and amazonite (לֶשֶׁם *lešem*). Likewise, emerald was unknown in the ancient world before the Ptolemaic period, and should also be ruled out. Serpentinite, though commonly attested in the Levantine Bronze Age, was carved into vessels and statues, and treated as an ornamental stone—not a precious one. Marginally attested green gemstones are less likely possibilities, they include Libyan desert glass (a scarab in Tutankhamun's pectoral), nephrite jade (a ring bezel of Tutankhamun),[50] and variscite (a Late Bronze Age tomb from Qatna, Syria).[51]

In my opinion, green jasper is the most plausible identification. Green jasper is well attested in the second and first millennium BCE, and no other Classical Hebrew term can be associated with it. That Neo-Babylonian speakers would borrow the Hebrew term *barraqtu* indicates that either *barraqtu*-stone was unusual enough to the Neo-Babylonians that they lacked a term for it, or at least that it was obscure enough that regular people were unfamiliar with it. This is true of green jasper, which would have been imported from Egypt[52]

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50   Harrell, James. (2012). Gemstones. *UCLA encyclopedia of Egyptology*, 1(1).

51   Abe, Yoshinari, et al. (2019). Use of variscite as a gemstone in the Late Bronze Age Royal Tomb at Qatna, Syria. *Journal of Archaeological Science*: Reports, 27, 101994.

52   Falk, David. (2013). The products of Hatshepsut's trade mission to Punt: An alternative translation of the Punt reliefs at Deir el-Bahari. GM, 238, 54.

through West Semitic territory to Mesopotamia, but not of serpentinite, which was imported from Iran.[53] The rarity of green jasper comports well with the general rarity of the native Babylonian (*w*)*urrīqu* too. The proliferation of green jasper in the Middle Bronze Age through the so-called "green jasper seal work-shop"[54] would provide ample opportunity to loan the term into Greek. This is a slight misnomer, as the scarabs were not always of true green jasper but of green jasper-like stones. This can also be said of Ancient Egyptian *nmḥf*, which archetypically intended green jasper, but could also refer to green jasper-like stones.[55] The *greenstone* pattern reemerges.

Based on a series of Semitic cognates and early borrowings, it may be posited that בָּרֶקֶת *bāreḵeṯ* descends from a Proto-Semitic term **wVrrVḳāntu* (derived from the root *w-r-ḳ* 'to be yellow/green') referring generically to any green precious stone. In Proto-West Semitic, analogy to **baraḵ-* modified the initial **w-* to **b-*, reflected in West Semitic reflexes and borrowings therefrom. A multiplicity of species-specific words indicates that בָּרֶקֶת *bāreḵeṯ* had a narrower meaning from its Proto-Semitic progenitor. In Hebrew, בָּרֶקֶת *bāreḵeṯ* probably referred to green jasper. However, ancient words for green jasper were generally used loosely.

53   Moorey, Peter Roger Stuart. (1999). *Ancient Mesopotamian materials and industries: the archaeological evidence*. Eisenbrauns.

54   Boschloos, Vanessa. (2015). From Egypt to Byblos … and back again: the production and distribution of Green Jasper seals in Egypt and the levant during the early 2nd millennium BCE. In *There and Back Again: the Crossroads II* (pp. 297–314). Charles University.

55   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 113–115.

נֹפֶךְ *Nōp̄ek̠*—Turquoise

נֹפֶךְ *nōp̄ek̠*, the fourth stone on the Priestly Breastplate, poses a challenge to scholars due to a lack of a Hebrew-internal etymology or self-evident meaning within the biblical text. That may be why ancient translators lacked a consensus as to the identity of this stone. A scholar favoring the Septuagint might prefer garnet (Greek ἄνθραξ *anthrax*), but the Aramaic targums offer a green stone (Jerusalem Neofiti זמרגדין, Yerushalmi Numbers אזמורד, Yerushalmi Exodus איזמורד, Onkelos אזמרגדין, all of which derive from Greek σμάραγδιον *smaragdion*). The latter translation is supported by the etymological data.

1   Derivation from Egyptian *mfk3t*

Without identifiable cognates or an internal derivation within Semitic, an extra-Semitic source is probable. Already in 1899[1] Von W. Max Müller linked *nōp̄ek̠* with the Ancient Egyptian term *mfk3t*. The etymology of Egyptian *mfk3t* is somewhat unclear. Scholars generally agree that the Egyptian prefix *m-* marks the preformative and *-t* marks femininity. The most viable etymology offered for *mfk3t* interprets the root *-fk3-* as an Egyptian reflex of a Proto-Afroasiatic color term,[2] but the time distance is too great to accurately reconstruct its form. Though *mfk3t* is the form regularly found in the dictionaries, many other spellings are attested. From the Old Kingdom when the spelling convention was fixed, Ancient Egyptian underwent numerous sound changes which are irregularly represented in later orthography, leading to divergent spellings.

The Egyptian sign ⟨3⟩ experienced extensive phonological evolution over the history of Egyptian, and is absent in later spellings in some instances. Egyptian ⟨3⟩ corresponds etymologically to the Proto-Semitic phonemes *l*, *r*, and *ʔ. In the Old Kingdom, ⟨3⟩ was realized as /l/ or /ɾ/ depending on the dialect. In the Middle Kingdom, /l/ became standard. By the New Kingdom, ⟨3⟩ had been rendered silent except word-initially, where it is used to indicate the

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1   Müller, W. Max. (1899). Der lupakku-nophek-Stein. *Orientalistische Literaturzeitung*, *2*(1–6), 20–21.

2   Takács, Gábor. (2007). *Etymological Dictionary of Egyptian: Volume Three: m*. Brill. 211.

presence of an initial vowel. The lack of a reflex for Egyptian *-t* is a result of both Egyptian and Hebrew development. Egyptian *-t* (probably *-at*) shifted to *-a* in the Middle Kingdom and *-i* by the New Kingdom.[3] Word-final short vowels *-a*, *-i*, and *-u* were used as case endings in Semitic, but were lost in Hebrew. The Middle and New Kingdom reflexes of the Egyptian feminine ending would have been zeroed in Hebrew. Because there is no evidence of the feminine suffix in *nōp̄ek*, the word must have been borrowed from Egyptian after the Middle Kingdom shift took place. The absence of a phonetic value for ⟨ꜣ⟩ confirms this date to be no earlier than the New Kingdom. Thus, *nōp̄ek* was borrowed during the early New Kingdom.

The *u*-segolate vowel pattern of Hebrew נֹפֶךְ *nōp̄ek* indicates a borrowing prior to the change **ū̆ > *ḗ* in Ancient Egyptian. The etymologically expected pattern is *$C_1C_2uC_3$, but נֹפֶךְ *nōp̄ek* reflects a pattern that reconstructs to $C_1uC_2C_3$ **nupk-*. Phonotactically, Classical Hebrew does not tolerate the pattern *$C_1C_2uC_3$, so speakers evidently restructured the word according to the pattern $C_1uC_2C_3$. Egyptian /f/ was borrowed into Hebrew as /p/, which later spirantized /p > ɸ > f/. Likewise, Hebrew /k/ spirantized to /x/. Although attested too late to directly prove the point, the Victory Stele of Piye (8th century BCE) preserves the form *mfk*, differing only in the quality of the initial nasal from Hebrew **nupk-* (> נֹפֶךְ *nōp̄ek*). This orthography testifies to the many sound changes that effected Egyptian since the spelling *mfkꜣt* was standardized in the Old Kingdom, such as the erosion of *-t* and the loss of *ꜣ*.

> ꜥḥꜥ⟨.n⟩ mꜣꜥ.n=f ḥḏ nbw ḥsbd mfk ḥsmn ꜥꜣt nb ꜥšꜣ.pl

> Then he offered silver, gold, lapis lazuli, turquoise, amethyst and many different precious stones.

Regarding their respective reflexes, there is a disparity in the realization of the initial nasal consonant between Hebrew נֹפֶךְ *nōp̄ek* and Ancient Egyptian *mfkꜣt*. A very late variation of *mfk ~ nfk* is attested in Lower Egyptian (that is the dialect of northern Egypt).[4] Canaan is geographically closer to northern Egypt, and Genesis 45:9–10 places the Israelite settlement in the Egyptian Delta. *Nōp̄ek* was almost certainly borrowed from Lower Egyptian, the only question is if this

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3   Noonan, Benjamin J. (2016). Egyptian Loanword as Evidence for the Authenticity of the Exodus and Wilderness Traditions. *"Did I Not Bring Israel Out of Egypt?" Biblical, Archaeological, and Egyptological Perspectives on the Exodus Narrative*, 49–67.

4   Takács, Gábor. (2007). *Etymological Dictionary of Egyptian: Volume Three: m*. Brill. 209.

variant is attested too late to be relevant.[5] One potential explanation for this variant is to posit that the *m-* became the so-called "assimilating nasal" of Late Egyptian.[6] But this explanation is difficult because the following consonant is the labial /f/, so the nasal should remain /m/ (or perhaps the labiodental nasal /ɱ/, which would still be rendered [m]).

Semitic phonotactics better explains this discrepancy. Greenberg[7] demonstrated the phonotactic intolerance of similar consecutive consonants in Hebrew roots, which applies to the labial consonants /m/ and /p/. When borrowing restructuring *mfuk* as *mupk*, a root *m-p-k* would have been reified. This root sequence violates the phonotactics of Hebrew, and so the simple dissimilatory adjustment *m > n* before *p* resolved the issue. In fact, *m > n* before *p* may be a regular adjustment of non-Semitic loanwords. An illustrative example is found with the way Egyptian *mn-nfr* *munf* 'Memphis' is rendered in Hebrew as נֹף *nōp̄* ~ מֹף *mōp̄* 'Memphis'.[8]

One biblical verse may hint at the fact that נֹפֶךְ *nōp̄eḵ* came from Egypt, as the linguistic evidence would indicate. Ezekiel (27:16) mentions that Aram purchased נֹפֶךְ *nōp̄eḵ* from Tyre:

אֲרָם סֹחַרְתֵּךְ מֵרֹב מַעֲשָׂיִךְ בְּנֹפֶךְ אַרְגָּמָן וְרִקְמָה וּבוּץ וְרָאמֹת וְכַדְכֹּד נָתְנוּ בְּעִזְבוֹנָיִךְ:

> Aram traded with you because of your wealth of merchandise, dealing with you in *nōp̄eḵ*, purple dyed-cloth, embroidery, fine linen, coral, and garnet.

Aram did not have direct access to Egypt to trade for *nōp̄eḵ*, so Aram must have obtained this stone indirectly from coastal Tyre. This is not true of Edom, an alternative reading found in some manuscripts of the Septuagint,[9] which borders Egypt and so would not require Tyre as an intermediary.

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5   Sauneron, Serge. (1961). "Remarques de philologie et d'étymologie (en marge des textes d'Esna)." *Mélanges Mariette*. Institut Français d'Archéologie Orientale. [French].

6   Satzinger, Helmut. (1988). Reading Late Egyptian. *Revue Roumaine d'Egyptologie*, (2–3), 1989.

7   Greenberg, Joseph H. (1950). The patterning of root morphemes in Semitic. *Word*, 6(2), 162–181.

8   Southern, Mark, & Vaughn, Andrew G. (1997). Where have all the nasals gone? *n*C > CC in North Semitic. *Journal of Semitic Studies*, 42(2), 263–282.

9   The translators of the Septuagint often interchange δ and ρ for ד and ר due to a collapse of distinction in Alexandrian Hebrew(?) between /d/ and /ɾ/, so this reading may not even reflect אדום* (which is typically spelled אדום).

2   Semantics

Because נֹפֶךְ *nōp̄eḵ* is derived from Egyptian *mfk3t*, נֹפֶךְ *nōp̄eḵ* can be reasonably equated with the stone intended by *mfk3t*. Egyptian sources attest that *mfk3t* was mined in the ancient site of Serabit el-Khadim in the Sinai Desert, which narrows the possibilities to two stones: turquoise and malachite. While both turquoise and malachite were mined at that location, Harris[10] (originally Loret[11]) demonstrated that *mfk3t* must mean turquoise and not malachite:

> From two of the same localities in Sinai where copper ore occurs, namely Magharah and Serabit el Khadim, turquoise was also obtained anciently and this occurrence in the same place of two different materials, one (malachite) green and the other (turquoise), though often blue, frequently greenish-blue or even definitely green, has given rise to considerable confusion, so much so that malachite has been termed turquoise matrix, though the two materials are totally different in composition and have no connexion with one another. It has also resulted in the ancient Egyptian name for turquoise (*mfk3t*) being translated sometimes as malachite, which if accepted, would mean that malachite was associated with silver, gold and costly stones, particularly lapis lazuli, and was used plentifully for finger rings, collars, inlay and scarabs and that there is no mention in ancient Egyptian texts of turquoise, whereas the Egyptian objects in the various museums prove the contrary, namely, that it was turquoise that was largely used in jewellery [*sic*] (particularly with lapis lazuli), for inlay and for scarabs and not malachite, which was very rarely employed as a gem stone [*sic*].

Assuming that נֹפֶךְ *nōp̄eḵ* must be turquoise merely because it is borrowed from AE *mfk3t* 'turquoise' would be naïve. Saving us from the etymological fallacy, the targums support the equation of *nōp̄eḵ* with turquoise by translating נֹפֶךְ *nōp̄eḵ* with variations of σμάραγδος *smaragdos*. Pliny informs us that several varieties of σμάραγδος *smaragdos* occur in copper mines.[12] Turquoise, a hydrated phosphate of copper and aluminum, would certainly meet this qualification.

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10   Lucas, Alfred, & Harris, John. (2012). *Ancient Egyptian materials and industries*. Courier Corporation.

11   Loret, Victor. (1928). La turquoise chez les anciens Egyptiens. *Kêmi* 1, 99–114.

12   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 17, paragraph 2.

The positive identification of *nōpek* with turquoise raises the question of why the Septuagint deviates from the correct identification in this instance. All the Greek translations translate *nōpek* with ἄνθραξ *anthrax* (and the Vulgate translates ἄνθραξ *anthrax* with *carbunculus*) 'garnet' (as convincingly argued by Thoresen,[13] also see Chapter 17) instead of the expected translation σμάραγδος *smaragdos* or the exotic καλλαϊς *kallais*.[14] Perhaps this is an emendation by a later scribe to differentiate *nōpek* from *bāreketh*, the third and fourth stones in the list, both of which originally might have been translated with σμάραγδος *smaragdos*. Ἄνθραξ *anthrax* was chosen in analogy to the stones mentioned in Isaiah 54:11–12, and is employed in the same context with variations of *kadkōd* in several targums. A similar emendation in the Septuagint may be found in Numbers 4:7, where ὑάκινθος *hyakinthos* 'blue' (translating תְּכֵלֶת *təkēlet*) has been replaced by ὁλοπόρφυρον *holoporphyros* 'wholly purple' to differentiate it from ὑάκινθος *hyakinthos* (mistranslating תַּחַשׁ *tahaš*) in the previous verse.[15]

Thus *mfk3t* designated turquoise exclusively, whereas the word for malachite was *w3d*. The best proof for the equation of *w3d* with malachite is an association by parallelism. In *The Maxims of Ptahhotep*,[16] verse 5 parallels *w3d* and "women at the grindstone".

> *dg3 mdt nfrt r w3d*
> *iw gm st m-a ḥmwt ḥr bnwt*

> Fine words are more sought after than *w3d*,
> but can be found with the women at the grindstone.

Malachite requires pulverization before it can be mixed with oil and applied to the eyelids, an act comparable to milling grain. Thus *w3d* designated malachite specifically. It does not appear that *w3d* was borrowed into Hebrew, rather another Classical Hebrew reflex of *mfk3t* is found.

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13 Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

14 Ibid.

15 Kotzé, Gideon R. (2019). 4QLXXNum and a Text-Critical Examination of a Debated Hebrew Term in Numbers 4. In *Scribal Practice, Text and Canon in the Dead Sea Scrolls* (pp. 56–74). Brill.

16 Dévaud, Eugène. (1916). *Les maximes de Ptahhotep: d'après le papyrus Prisse, les papyrus 10371/10435 et 10509 du British Museum et la tablette Carnarvon: texte.*

3   פוּךְ *Pūḵ*

The etymological history of פוּךְ *pūḵ* is complex. Lambdin[17] conjectured that פוּךְ *pūḵ* was a later borrowing of *mfꜣ3t* relative to נֹפֶךְ *nōp̄eḵ*. Whereas נֹפֶךְ *nōp̄eḵ* is borrowed from a form like **mpuk*, פוּךְ *pūḵ* evidences additional Egyptian sound changes. Harrell, Hoffmeier, and Williams[18] point out that dropping the nominalizing *m*-preformative prefix in Egyptian would result in the form פוּךְ *pūḵ*, which would fully explain the data. Noonan rejects this etymology because "there is no evidence that powdered turquoise was ever used as a cosmetic pigment in ancient Egypt", and a form of this word with the dropped *m*-preformative "never occurs in Egyptian texts, although the adjectival form *fꜣ3tỉ* 'made of turquoise' without an initial *m* is attested."[19] The second argument is self-defeating, as the existence of *fꜣ3tỉ* implies the existence of the *m*-preformative-less form **fꜣ3t*. And as predicted, *fꜣ3t* is attested, examples from the Old Kingdom were collected by Nuzzulo.[20] But dropping the *m*-preformative is unnecessary to resolve this phonological disparity. In many Egyptian words, the spelling of nouns with and without *m*- preformative commonly interchanges, which is usually interpreted as conditioned nasal devoicing.[21] A devoiced **m̥*- would assimilate to the following labial consonant /f/ **m̥f- > f*, which would appear as *p*- in Hebrew.

The rigid lexical differentiation between *mfꜣ3t* 'turquoise' and *wꜣ3ḏ* 'malachite' in Egyptian does not preclude a reapplication of *fꜣ3t* in Hebrew. The form *fꜣ3t* must have been loaned during the New Kingdom when *ꜣ* was silent. Malachite ceased to be used as a cosmetic in Egypt in the 12th century BCE,[22] coinciding with the closure of the mines at Serabit el-Khadim. Despite being first attested only in the Book of Kings, it can be inferred that *fꜣ3t* was borrowed prior to the 12th century BCE. The interchange between the byforms

17   Lambdin, Thomas O. (1953). Egyptian Loan Words in the Old Testament. *Journal of the American Oriental Society, 73*(3), 145–155.

18   Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research, 27*(1), 1–52. 31.

19   Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Page 171.

20   Nuzzolo, Massimiliano. (2021). The Palermo Stone and its Associated Fragments: New Discoveries on the Oldest Royal Annals of Ancient Egypt. *The Journal of Egyptian Archaeology, 107*(1–2), 57–78.

21   Takács, Gábor. (2007). *Etymological Dictionary of Egyptian: Volume Three: m.* Brill. 209.

22   Scott, David A. (2016). A review of ancient Egyptian pigments and cosmetics. *Studies in Conservation, 61*(4), 185–202.

mfꜣkꜣt ~ fꜣkꜣt was regular and thus stable in New Kingdom Egyptian, but loaned into a Semitic language it would be irregular and thus unstable. Because the interchange between **nupk* and **pūk* is not regular in Hebrew, *mfꜣkꜣt* 'turquoise' maintained its semantic value as *nōp̄eḵ* 'turquoise', while *fꜣkꜣt* (pronounced **fūk* in the New Kingdom) underwent semantic development in its reflex *pūḵ*, which was reapplied to another stone. A competing etymology for פּוּךְ *pūḵ* which derives it from a root **פ-ו-ךְ *p-w-k* or **פ-כ-ךְ *p-k-k* 'to crush, pulverize'[23] is challenged by the fact that no such root exists in Hebrew,[24] while פּוּךְ *pūḵ* lacks cognates in other Semitic languages.

Textual evidence from the Hebrew Bible leaves little in the way of ambiguity as to this stone's identity. In some verses (II Kings 9:30, Jeremiah 4:30), פּוּךְ *pūḵ* refers to kohl, the traditional eye cosmetic of the ancient Levant. In I Chronicles 29:2, פּוּךְ *pūḵ* is listed as a building material in the construction of the Temple, likewise in Isaiah 54:11, it is paralleled with *sappīr* and implied by context to be a gemstone. Kohl in ancient Egypt was mostly restricted to the minerals galena and malachite (stibnite/antimony was exceptionally uncommon),[25] of which only malachite was used as a precious stone. Malachite occurs at Serabit el-Khadim, the same area as turquoise, though not in the same mines.[26] However, it is unlikely that the ancient Israelites imported malachite from Egypt when a suitable alternative was locally available.

Evidence comes from an unlikely source: Mesopotamia. In the *Annals of Sennacherib*, *guḫlu* 'kohl' is listed as a tribute item given by Hezekiah to Sennacherib (OIP 234:42). Indeed, *guḫlu* is rendered in Sumerian as [i]m.sig₇.sig₇, literally 'greenish paste'.[27] Elsewhere in Mesopotamian texts, *guḫlu* is frequently described as Edomite in provenance: "You grind 1/8 shekel of *guḫlu* from Edom (and) hi[s] eyes ...".[28] Fincke points out that Judah controlled parts of Edom at this time, therefore it is unsurprising that Hezekiah could offer

23　Klein, Ernest, & Rabin, Ḥayyim. (1987). *A comprehensive etymological dictionary of the Hebrew language for readers of English*. Carta Jerusalem. Entry: פּוּךְ.

24　Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Footnote 476.

25　Hardy, AD, et al. (2006). Egyptian Eye Cosmetics ("Kohls"): Past and present. In *Physical techniques in the study of art, archaeology and cultural heritage* (Vol. 1, pp. 173–203). Elsevier.

26　Harrell, James A. (2023). *Archaeology and Geology of Ancient Egyptian Stones*. 2 Volumes. Archaeopress.

27　Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry, *guḫlu*.

28　Fincke, Jeanne C. (2010). Cuneiform tablets on eye diseases: Babylonian sources in relation to the series DIŠ NA IGIII-ŠÚ GIG. In *Advances in Mesopotamian Medicine from Hammurabi to Hippocrates* (pp. 79–104). Brill.

Edomite *guḫlu* as tribute to Sennacherib.[29] But Fincke interprets *guḫlu* as 'antimony, stibium',[30] which were unknown in antiquity. Potts[31] rejects this identification in favor of the aromatic resin 'bdellium'. Rees is uncertain, suggesting "eye-paint or a raw ingredient which could be used to make eye-paints".[32] It can be deduced from these texts that *guḫlu* was a greenish mineral, soft enough to be pulverized into kohl, that was mined in Edom. And just such a mineral is known from the copper mines of Timna and Wadi Feynan. Solidly within Edomite territory, they produced a copper ore in the form of blue-green eilatstone (see Chapter 5.2). Eilatstone is soft enough that it could be powdered for use as kohl. Although cosmetic palettes are extant from the eighth–seventh centuries BCE in Israel,[33] they have yet to be tested for cosmetic residue. Eilatstone, the attractive blue-green copper ore mined in Edom, would appear to be a perfect candidate for Sennacherib's *guḫlu*.

Given the Edomite provenance of *guḫlu* 'eilatstone' and the restriction of the term *guḫlu* to the Standard Babylonian dialect, it is probable that this is an Edomite loanword into Akkadian. While the known lexicon of Edomite is quite limited, the donor must be a cognate of Late Hebrew כּוֹחַל *kōḥal*. There is no question that כּוֹחַל *kōḥal* referred to a species of stone, the Aramaic term אַבְנָא דְכוּחְלָא 'stone of *kuḥlā*' is found in the Babylonian Talmud. The nominal *כּחל *kōḥal* is unattested in the Hebrew Bible, but the verbal form כָּחַלְתְּ עֵינַיִךְ '(you) kohled your eyes' is found in Ezekiel 23:40, which implies the existence of *כּחל *kōḥal* in Classical Hebrew. In Semitic languages, the root כ-ח-ל *k-ḥ-l* means 'to be dark'.[34] In the Hebrew of the medieval period, the meaning 'blue' developed (whence Israeli Hebrew כָּחוֹל 'blue'). Edomite **kuḥl* appears to have referred generically to kohl (as indicated by *guḫlu*) like Arabic كُحْل *kuḥl*. In contrast, Hebrew *כּחל *kōḥal* appears to have referred specifically to darkening with galena, in contrast with פּוּךְ *pūḵ*. It can be inferred that Edomite did not borrow פּוּךְ *pūḵ* as did Hebrew.

פּוּךְ *pūḵ* fits the description of a biblical term for eilatstone flawlessly. Yet the semantic development from Egyptian *fk3t* 'turquoise' to Hebrew פּוּךְ *pūḵ* 'eilatstone, kohl' was merely the first step. פּוּךְ *pūḵ* was loaned into Greek as the word

29 Ibid.

30 Ibid.

31 Potts, Daniel T., Parpola, Asko, Parpola, Simo, & Tidmarsh, J. (1996). Guḫlu and Guggulu. *Wiener Zeitschrift für die Kunde des Morgenlandes, 86*, 291–305.

32 Rees, Susannah. (2023). *Cosmetics in the Hebrew Bible* (Doctoral dissertation, King's College London).

33 Barag, Dan. P. (1982). Cosmetic glass palettes from the eighth–seventh centuries BC. *Journal of Glass Studies*, 11–19.

34 Demsky, Aaron. (1972). 'Dark Wine' from Judah. *Israel Exploration Journal, 22*(4), 233–234.

φῦκος *phykos* 'orchil', but almost certainly not from (Israelite/Judahite) Hebrew. Several pieces of circumstantial evidence promote a Phoenician loan scenario over another Canaanite language. II Kings 9:30 describes Jezebel, the detested Tyrian queen of the Israelite King Ahab, applying *pūḵ* to her eyes. פּוּךְ *pūḵ* is also associated with vanity by Jeremiah (4:30), which suggests that פּוּךְ *pūḵ* was viewed as an improper—perhaps culturally foreign—concept. Phoenician was also the usual source of Canaanite loans into Greek during the first millennium BCE. The sound change of *u > ü* in Phoenician is reflected in the ypsilon in Greek,[35] but perhaps the original *ū* would be rendered in the same manner.

The specific meaning 'eilatstone' is no longer evident in Greek φῦκος *phykos*, so it is appropriate to digress as to why this etymology is correct. Beekes[36] describes the semantic evolution of φῦκος *phykos*, the word expanding from 'cosmetic' to 'orchil' to the fungus *Roccella tinctoria*, the source of orchil. In ancient Greece, orchil was used as a cosmetic. The meaning 'kohl' was extended to orchil by abstraction to 'cosmetic'. Orchil is a red-purple colorant derived from the lichenized fungus *Roccella tinctoria*. I use 'orchil' as a generic term for colorants derived from lichenized funguses. These colors range and it is clear multiple genera were utilized for this purpose in antiquity. Theophrastus, Dioscordies, and Pliny all mention orchil as a source of color. Unfortunately, there is a lack of recent treatments of the classical sources on orchil. *A Short History of the Orchil Dyes*[37] (1966) covers the history of the modern "rediscovery" of orchil by science, whereas the outdated *Experimental researches concerning the philosophy of permanent colours: and the best means of producing them, by dyeing, calico printing*[38] lists references in classical literature.

The usage of orchil as a cosmetic did not originate in Classical or Hellenic Greece, it may be mentioned in a document dated to a millennium earlier at Ugarit. I suggest that the Ugaritic word *ġlp* did not mean 'murex' or '(a plant)',[39] but 'orchil' (the word *anhb*, with which it is frequently paired, likely meant 'operculum'). In Classical Hebrew, orchil is referred to in Isaiah 3:16, where the

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35   Fox, Joshua. (1996). A sequence of vowel shifts in Phoenician and other languages. *Journal of Near Eastern Studies*, *55*(1), 37–47.

36   Beekes, Robert. (2009). *Etymological dictionary of Greek* (2 vols.). Brill. Entry: φῦκος.

37   Kok, Annette. (1966). A short history of the orchil dyes. *The Lichenologist*, *3*(2), 248–272.

38   Bancroft, Edward. (1814). *Experimental researches concerning the philosophy of permanent colours: and the best means of producing them, by dyeing, calico printing, &c* (Vol. 1). T. Dobson.

39   Watson, Wilfred G.E. (2007). Making Sense of Ugaritic anhb and *ġlp*. *Ugarit-Forschungen*, (39), 669–672.

daughters of Jerusalem are described as וּמְשַׂקְּרוֹת עֵינָיִם 'and eyes rouged with orchil'. The correctness of this interpretation is confirmed by Midrash Rabba Leviticus 16, where Ribbi Mane of Caesarea explains שֶׁהָיוּ מְסַקְּרוֹת עֵינֵיהֶם בְּסִיקְרָא "that they would rogue their eyes with סִיקְרָא *sīḳrā* (orchil)", whereas Resh Laqish explains with a Greek term: בְּקוֹלוּרְיָא אֲדֻמָּה "with red κολλύριον *kollyrion* (used loosely to mean 'kohl')". Although this verb is found only once in Classical Hebrew, the verbal root is found in numerous common words in Late Hebrew, where the noun סְקְרָה *sīḳrā* 'orchil' (corresponding to Classical Hebrew *שְׂקְרָה *śīḳrā*) is found. A metastasized form שֶׂרֶק *śereḳ* is attested in a wedding song which is twice quoted in talmudic literature.[40] For more information on how this word was treated in Late Hebrew and European languages, see the papers collected in the second part of the festschrift *Fucus: A Semitic/Afrasian Gathering in Remembrance of Albert Ehrman*.[41]

As I understand, פּוּךְ *pūḳ* intended the green kohl produced from eilat-stone specifically, whereas *כֹּחַל *kōḥal* referred to darkening galena and *שְׂקְרָה *śīḳrā* orchil rogue. If this is the case, than the generic term for kohl must be פּוּךְ *pūḳ*, *כֹּחַל *kōḥal*, or *שְׂקְרָה *śīḳrā*, or a separate term altogether. A personal name in the Book of Job hints at the solution. One of Job's daughters is named קֶרֶן הַפּוּךְ *Ḳeren Happūḳ* (Job 42:14). This term is otherwise absent from the Hebrew Bible and early rabbinic literature, nevertheless Isaacides explains the meaning of the name as על שם הקרן שנותנין בו כוחל ובורית "by the name of the horn that they place in it kohl and soap", the cosmetic tube in which kohl was stored. Absent another term for cosmetic tubes in Classical Hebrew, this interpretation is viable. That the general term for 'cosmetic tube' was קֶרֶן הַפּוּך *ḳeren happūḳ* implies that פּוּךְ *pūḳ* was the generic term for 'kohl' in Hebrew. It is the broader meaning 'kohl' that must have been loaned into Greek to give rise to the diverse meanings of Greek φῦκος *phykos* and Latin *fūcus*.

> Egyptian *mfk3t* 'turquoise'
>> Hebrew נֹפֶךְ *nōp̄eḵ* 'turquoise'
>> Hebrew פּוּךְ *pūḵ* '(turquoise →) eilatstone(?) → kohl'
>>> Greek φῦκος *phykos* 'kohl → orchil → entity from which orchil is derived (= *R. tinctoria*)'
>>>> Latin *fūcus* '*R. tinctoria*, orchil → rouge → disguise'

40   Babylonian Talmud, Sanhedrin 14a and Kethubboth 17a.

41   Arbeitman, Yoel L. (Ed.). (1988). *Fucus: A Semitic/Afrasian Gathering in Remembrance of Albert Ehrman* (Vol. 58). John Benjamins Publishing.

The Ancient Egyptian term *mfk3t* 'turquoise' was borrowed into Hebrew during the New Kingdom, manifesting in two separate forms with divergent meanings. The form נֹפֶךְ *nōp̄ek̲* refers to a precious stone, and based on etymology and the Aramaic targums, likely referred to turquoise. The form פּוּךְ *pūk̲* refers to a precious stone, green kohl and kohl in general, and borrowed into Greek, it experienced further semantic expansion. On material considerations, פּוּךְ *pūk̲* probably referred to eilatstone, which Babylonian texts refer to.

סַפִּיר *Sappīr*—Lapis Lazuli

Sappīr is probably the most iconic gemstone in the Hebrew Bible, despite its frequent misidentification with sapphire. In academic circles, it is common knowledge that the "biblical sapphire" referred not to sapphire, but to lapis lazuli. When and how that shift occurred is less well explored, so I will discuss it here.

It is difficult to determine when the word סַפִּיר *sappīr* came to mean sapphire because early Hebrew sources rarely describe the stone directly. Lapis lazuli occurs only in deep blue (albeit, crossed by bands of white and speckled with gold pyrite), but sapphires occur in every color. Color can therefore be used as a proxy for identity. The first unambiguous evidence that the semantic shift *lapis lazuli → sapphire* affected Hebrew is found in a pre-Saadian translation of the Pentateuch into Arabic, where סַפִּיר *sappīr* is translated יאקות אלאביץ׳ *yāqūt ʾal-abyaḍ* 'white sapphire'.[1] Such a translation necessitates the semantic development *lapis lazuli → blue sapphire → white sapphire*. The culmination of this identity is found in the Zohar (13th century CE), which states that גְּוֶון סַפִּיר דְּאִתְכְּלִילוּ מִכָּל גְּוֶונִין "the color of *sappīr* is that it contains all colors".[2]

The interpretation with *blue sapphire* had been altered by textual and philosophical exegesis in the medieval period to *white sapphire*. Maimonides (12th century CE) developed the idea most fully in his *Guide for the Perplexed*, but the early Arabic translation demonstrates that the semantic shift predates him by centuries. I shall summarize it briefly here. Exodus 24:10 describes an esoteric view of God's throne כְּמַעֲשֵׂה לִבְנַת הַסַּפִּיר וּכְעֶצֶם הַשָּׁמַיִם לָטֹהַר "like a work of tiles of *sappīr* and like the essence of the sky for purity". Because the word לְבֵנָה *ləḇēnā* 'brick, tile' is related to the word לָבָן *lāḇān* 'white', air (of the sky) is colorless, and the word טֹהַר 'purity(?)' is semantically difficult, these ideas can be strung together to deduce that סַפִּיר *sappīr* is also colorless and transparent.[3] Thus, the equation between סַפִּיר *sappīr* and lapis lazuli must have been lost prior to this point, allowing sufficient time for the development *lapis lazuli → blue sapphire → white sapphire*. The exact date is unclear, but it must have been around the 7th century CE give-or-take two centuries.

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1 Amar, Zohar. (2017). *The Beauty of Gemstone: The Hoshen Jewels and Precious Stones in the Ancient World.* 127.

2 *Zohar, Noah* 34:266.

3 Maimonides, *Guide for the Perplexed*, 1:28.

First it must be noted that in the medieval period, superstrate languages and cultures heavily influenced Hebrew, especially semantically. Greek and Latin possessed a very similar word to Hebrew סַפִּיר *sappīr*, Greek σάπφειρος *sappheiros* and Latin *sapphirus* (all three terms are related, discussed later). The semantic change in Hebrew may be traced to the same shift in Greek and Latin. In the 4th century CE, the Middle Persian word *lājvard* 'lapis lazuli' was borrowed into Greek as λαζουρ- *lazour-* 'lapis lazuli'.[4] This opened the existing word for lapis lazuli, σάπφειρος *sappheiros*, for semantic dissimilation. Greek σάπφειρος *sappheiros* expanded from 'lapis lazuli' to '(generic) blue precious stone', followed by semantic contraction to 'sapphire'. Once Greek λαζουρ- *lazour-* 'lapis lazuli' was borrowed into Medieval Latin as *lazulum*, Latin and the Romance languages began to copy the same shift. Latin *sapphirus* 'lapis lazuli' came to refer to sapphire, whereas *lazulum* was used for lapis lazuli. As the superstrate word shifted in meaning to sapphire, the way Jews understood the meaning of סַפִּיר *sappīr* in ancient texts shifted with it.

Medieval excursions aside, placing lapis lazuli into its ancient context may help us understand סַפִּיר *sappīr* in the Hebrew Bible. Lapis lazuli was greatly appreciated by the ancient people of the Levant. It has no equal in esteem in ancient texts, carved into elite jewelry, fit to inlay the mask of Tutankhamun. Lapis lazuli originated in the Badakhshan province of Afghanistan, and was exported across the world. Considering the great distance between Badakhshan and Egypt, the stone was traded (offered as tribute, and/or given in a dowry) along a route that passed first from Badakhshan to Mesopotamia,[5] then Mesopotamia to Anatolia, and finally Anatolia to Egypt. Isotopic analysis confirms that Egypt's lapis lazuli did indeed originate in Afghanistan,[6] despite the great distance involved. Israel is far to the west of Badakhshan, and so the provenance of the word סַפִּיר *sappīr* may very well lie in a language to the east of Israel.

There is a common ancient Levantine term for lapis lazuli, which manifests as *uqnû* in Akkadian and *ʾiqnʾu* in Ugaritic. Even Phoenician possessed a form of this word in *ʾqnʾ*, which designated 'blue-dyed (figuratively, 'lapis lazuli-

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4 Frison, Guido, and Giulia Brun. (2016). Lapis Lazuli, Lazurite, Ultramarine 'Blue', and the Colour Term 'Azure' Up to the 13th Century. *J. Int. Col. Assoc*, *16*, 41–55.

5 Herrmann, Georgina. (1968). Lapis lazuli: the early phases of its trade. *Iraq*, *30*(1), 21–57.

6 Lo Giudice, A., Angelici, D., Re, A., Gariani, G., Borghi, A., Calusi, S., & Guidotti, M.C. (2017). Protocol for lapis lazuli provenance determination: evidence for an Afghan origin of the stones used for ancient carved artefacts kept at the Egyptian Museum of Florence (Italy). *Archaeological and Anthropological Sciences*, *9*(4), 637–651.

colored') wool'.[7] Hebrew and Aramaic are missing this common word for lapis lazuli. As a more marginal word for lapis lazuli, it is little surprising that a plausible etymology for סַפִּיר *sappīr* has eluded scholars. Towards a minor point of interest, סַפִּיר *sappīr* is the etymon of the surname of the famous 20th century linguist Edward Sapir. While the etymology of the name Edward is well established, the etymology of Sapir (from Hebrew סַפִּיר *sappīr*) has not been yet successfully demonstrated. This chapter shall remedy that problem.

1   The Biblical Sources

The Hebrew Bible describes סַפִּיר *sappīr* with an exceptional richness of color and context, more detailed perhaps than any other stone. *Sappīr* is compared to the sky in Exodus 24:10, highly reminiscent of other Levantine descriptions of lapis lazuli:[8]

וַיִּרְאוּ אֵת אֱלֹהֵי יִשְׂרָאֵל וְתַחַת רַגְלָיו כְּמַעֲשֵׂה לִבְנַת הַסַּפִּיר וּכְעֶצֶם הַשָּׁמַיִם לָטֹהַר

and they saw the God of Israel, and under His feet as the work of a pavement of *sappīr*, like the very heaven for purity(?).

In a very different context, Job 28:6 describes how סַפִּיר *sappīr* is mined from the earth, just like gold ore.[9] On its face, this parallelism merely juxtaposes סַפִּיר *sappīr* with gold ore, but it may hint at a connection between the two.

מְקוֹם־סַפִּיר אֲבָנֶיהָ וְעַפְרֹת זָהָב לוֹ׃

Its [earth's] rocks are a source of *sappīr*; and it has gold ore.

The juxtaposition of lapis lazuli with gold ore is phenotypic, as veins of small pyrite crystals resembling gold flakes characterize lapis lazuli. This display is

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7   Cross, Frank Moore. (1979). A recently published Phoenician inscription of the Persian period from Byblos. *Israel Exploration Journal*, 40–44.

8   Rappenglück, Barbara. (2003). The material of the solid sky and its traces in culture. In *The inspiration of astronomical phenomena. Proceedings of the Fourth Conference on the Inspiration of Astronomical Phenomena, sponsored by the Vatican Observatory and the Steward Observatory, Arizona, Magdalen College, Oxford* (pp. 3–9).

9   Amzallag, Nissim. (2017). The Forgotten Meaning of ʿāpār in Biblical Hebrew. *Journal of American Oriental Society*, 137(4), 767–783.

not dissimilar to native gold crystals on matrix, which may also form veins that sparkle out of their host rock.

That lapis lazuli was incredibly expensive, given its provenance, combined with its striking appearance surely contributed to a rich array of symbolic associations which find expression in the Hebrew Bible. With a dark blue base (lazurite), marked with white bands (calcite) and golden flecks (pyrite), reminiscent of the constellated night sky, lapis lazuli symbolized the immense cosmos. For the ancients, more than modern man, the cosmos was the divine realm. Planets were named for gods, heroes deified into constellations. Within the theology of the Hebrew Bible, this theme was remodeled. The 'heavens' became the figurative home of an immaterial God, a fossilized idiom from a primitive age. Under this system, lapis lazuli became symbolic of heaven, the Place of God.

Beyond the two verses already analyzed here, there is another worth discussing, paying particular attention to the symbolic meaning of lapis lazuli. Lamentations 4:7 reads:

זַכּוּ נְזִירֶ֫יהָ֙ מִשֶּׁ֔לֶג
צַח֖וּ מֵחָלָ֑ב
אָ֤דְמוּ עֶ֙צֶם֙ מִפְּנִינִ֔ים
סַפִּ֖יר גִּזְרָתָֽם׃

Her elect were purer than snow,
Whiter than milk;
Their limbs ruddier than pearls,
Lapis lazuli, their beards.

This verse makes richly symbolic (*non-literal*) usage of color. The last line סַפִּ֖יר גִּזְרָתָֽם "lapis lazuli, their beards" is the most perplexing of them all. First, it must be established that גִּזְרָתָם means 'their beards'. In the Neo-Assyrian period (and perhaps universally in Semitic cultures), the beard is the ultimate masculine symbol.[10] Whereas the standard Classical Hebrew term for 'beard' is זָקָן *zāḳān*, the term גִּזְרָה *gizrā* 'cutting' provides a play on words. Beards are cut and shaped, as is lapis lazuli. The symbol of a lapis-lazuli beard has its origins in Mesopotamia, where gods and kings are frequently depicted or described as

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10   Bennett, Ellie. (2022). Beards as a Marker of Status during the Neo-Assyrian Period. *The King as a Nodal Point of Neo-Assyrian Identity*.

having lapis-lazuli beards.[11] Appropriating this symbol for its own purposes, the line סַפִּיר גְּזְרָתָם "lapis lazuli, their beards" depicts Israelite men symbolically as kings. Understanding the cultural context of the symbolism of this poetic verse offers it meaning foreign to modern man: it describes the exalted status of the Israelites before they sinned.

2   Greco-Roman Sources for Σάπφειρος Sappheiros

The Septuagint, Vulgate, and Josephus (when the order is corrected) translate סַפִּיר *sappīr* with its Greek cognate σάπφειρος *sappheiros*. A brief examination of some of the most important Greek and Latin writings that address the σάπφειρος *sappheiros* will demonstrate the correctness of translation/identification. Theophrastus' *On Stones* is the oldest surviving treatise in the western literary corpus (dated to the end of the fourth century BCE[12]) on the subject of precious stones. Theophrastus is the first author to mention σάπφειρος *sappheiros*.

> Τῶν δὲ λίθων καὶ ἄλλαι (διάφοροι) τυγχάνουσιν ἐξ ὧν καὶ τὰ σφραγίδια γλύφουσιν. αἱ μέν τῇ ὄψει μόνον οἷον τὸ σάρδιον καί ἡ ἴαστης καὶ ἡ σάπφειρος · αὕτη δ᾽ ἐστὶν ὥσπερ χρυσόπαστος.

> There are also other stones from which seals are cut that are (remarkable), some of them only for their appearance, such as the *sardion*, the *iaspis*, and the *sappheiros*, and the last of these seems to be spotted with gold.[13]

To be "spotted with gold" as σάπφειρος *sappheiros* was described in this passage is not a description of corundum sapphire. Rather, it is a perfect description of lapis lazuli, which is well attested archeology from prehistory through antiquity throughout the Mediterranean. Lapis lazuli is mainly composed of three minerals, the main body of blue *lazurite*, banded by white *calcite*, and flecked with fools gold, *pyrite*. Lapis lazuli is the only stone which fits Theophrastus' description here. Thus lapis lazuli can be confirmed as the earliest meaning

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11   Winter, Irene J. (1999). The aesthetic value of lapis lazuli in Mesopotamia. *Cornaline et pierres précieuses. A. Caubet (Ed.). La Méditerranée de l'Antiquité à l'Islam*, 43–58.

12   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. 4.

13   Ibid., section 23.

of σάπφειρος *sappheiros*. Further on in Theophrastus, another passage informs the reader that σάπφειρος *sappheiros* is qualitatively similar to another precious stone called κύανος *kyanos*.

> καὶ ἣν καλοῦσι σάπφειρον · αὕτη γὰρ μέλαινα οὐκ ἄγαν πόρρω τοῦ κυάνου τοῦ ἄρρενος

> And there is also the stone called *sappheiros*, which is dark and not very different from the male *kyanos* ... [14]

Pliny describes *sappheiros* and *cyanos* side-by-side in his *Natural History*,[15] and his description makes it clear that *sappheiros* refers to lapis lazuli:

38   *Reddetur et per se cyanos, accommodato paulo ante et iaspidi nomine a colore caeruleo. optima Scythica, dein Cypria, postremo Aegyptia. adulteratur maxime tinctura, idque in gloria est regum Aegypti; adscribitur et qui primus tinxit. dividitur autem et haec in mares feminasque. inest ei aliquando et aureus pulvis, non qualis sappiris; in his enim aurum punctis conlucet.*

39   *Caeruleae et sappiri, rarumque ut cum purpura, optimae apud Medos, nusquam tamen perlucidae. praeterea inutiles scalpturis intervenientibus crystallinsi centris. quae sunt ex iis cyanei coloris, mares existimantur.*

38   We must also give a separate account of cyanos, a name which, until very recently, was given to a species of iaspis, on account of its cærulean colour. The best kind is that of Scythia, the next best being the produce of Cyprus, and, last of all, that of Egypt. An artificial kind is much in use, that is prepared by dyeing other substances; and this invention is looked upon as one of the great glories of the kings of Egypt, the name of the king who first discovered it being still preserved in their annals. This stone, too, is divided into male and female, and sometimes it has the appearance of being powdered with a golden dust, in much the same way as sapphiros.

39   For sapphiros, too, is refulgent with spots like gold. It is also of an azure colour, though sometimes, but rarely, it is purple; the best kind being that which comes from Media. In no case, however, is this stone diaphanous;

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14   Ibid., section 37.

15   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapters 38–39.

in addition to which, it is not suited for engraving when intersected with hard particles of a crystalline nature. Those among them that have the colour of cyanos are generally thought to be the male stones.

The semantic distinction between κύανος *kyanos* and lapis lazuli is complicated. The earliest Greek word for lapis lazuli was undoubtably κύανος *kyanos*, which already occurred in Mycenaean Greek as 𐀓𐀷𐀜 *ku-wa-no*. The Levantine wanderword *uqnû*/*ʾiqnʾu* 'lapis lazuli' has long been identified as its donor, the first two consonants metathesized (*ʾuqanʾu > *quʾanʾu > **kuano-* + -*s*). Theophrastus describes σάπφειρος *sappheiros* as "not very different" (Greek: οὐκ ἄγαν πόρρω) from the male κύανος *kyanos*. Similar—yet not identical. Pliny implies that the distinction between *cyanos* and *sapphiros* is the presence of golden marks, which is sufficient information to assign mineralogical identities. In Theophrastian-Plinian mineralogy, it would appear that κύανος *kyanos*/*cyanos* referred to pure 'lazurite'[16] and σάπφειρος *sappheiros*/*sapphiros* to 'lapis lazuli'.

Theophrastus was the first Greek to mention σάπφειρος *sappheiros*, which I propose was borrowed to differentiate lapis lazuli from pure lazurite. Thus κύανος *kyanos*, which originally must have referred to lapis lazuli and (secondarily) lazurite alike, became restricted to lazurite, whereas the more recently borrowing σάπφειρος *sappheiros* was used only for lapis lazuli. This is akin to the later development whereby λαζουρ- *lazour-* displaced σάπφειρος *sappheiros*, which came to refer to sapphire. Of the three Greek terms for lapis lazuli, σάπφειρος *sappheiros* is most interesting in my view, part of a family of borrowings from across the ancient eastern Mediterranean.

Hebrew or Phoenician was likely the source language of Greek σάπφειρος *sappheiros*. A particular phonological change indicates the directionality Hebrew → Greek, strengthened by the historical east to west movement of lapis lazuli. The Greek digraph ⟨ει⟩ was realized as /ẹ:/ until sometime in the fifth century BCE, at which point it gradually shifted to /i:/ before a consonant.[17] Use of ⟨ει⟩ to transliterate Hebrew /i:/ is commonplace.[18] As Theophrastus' *On*

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16   Schneider erroneously(?) suggested azurite for κύανος *kyanos*, which was not treated a gemstone in antiquity. See: Schneider, Pierre. (2017). *From India to the Black Sea: an overlooked trade route?*. Note 43. [Preprint].

17   Horrocks, Geoffrey. (2014). *Greek: A History of the Language and its Speakers*. John Wiley & Sons. 163.

18   For example, the Septuagint to Daniel 10:6, Ezekiel 1:16, and Song of Songs 5:14 transliterate תַּרְשִׁישׁ with θαρσεις, so ⟨ει⟩ was certainly a legitimate rendering of /i:/.

Stones is dated to the end of the fourth century BCE,[19] only a small window of time exists in which Hebrew סַפִּיר *sappīr* would have been rendered in Greek as σάπφειρος *sappheiros*. Because ⟨ει⟩ corresponds to Hebrew /iː/ in this word, it can be ascertained that Greek borrowed סַפִּיר *sappīr* as σάπφειρος *sappheiros* in the 4th–3rd centuries BCE. Hebrew סַפִּיר *sappīr* can be plausibly established as the donor of Greek σάπφειρος *sappheiros*.

The Aramaic targums use borrowings from Greek σάπφειρος *sappheiros* to translate סַפִּיר *sappīr*: Peshita ספילא *spyl'*, Jerusalem Neofiti סמפולינא *smpwlyn'*, Neofiti ספרינה *sprynh*, and Pseudo-Jonathan Exodus ספירינון *spyrynwn*. It is not immediately obvious whether these are native or derived from peripheral Greek variants[20] of σάπφειρος *sappheiros*, though the variation in form weighs in favor of the latter. This does not add any new information.

3   The Supposed Indian Origin

It is widely claimed that Hebrew סַפִּיר *sappīr* originates from Sanskrit शनिप्रिय *śanipriya* 'lapis lazuli', a connection first suggested by Paul de Lagarde in his 1866 treatise *Gesammelte Abhandlungen*.[21] The difficulties with this etymology were summarized by Powels in the German article *Indische Lehnwörter in der Bibel*:[22]

1. *śanipriya* is a young term which is absent in the literature, it is only found in lexicographical works.
2. *śanipriya* is not a term for a specific type of gem in Sanskrit.
3. *śanipriya* is a foreign term (allegedly borrowed from σάπφειρος *sappheiros*) transformed by folk-etymology.[23]

Additional criticisms from a Hebrew philological point of view may be added. Historically, Sanskrit ⟨श⟩ was realized /ɕa/. Therefore it would be odd to find Sanskrit /ɕa/ rendered in Hebrew with an affricate ס */ts/ instead of a pure

19   Caley, Earle Radcliffe, and John FC Richards. *Theophrastus on stones: introduction, Greek text, English translation, and commentary*. The Ohio State University Press, 1956. Page 4.

20   Camagni, Francesco. (2018). *The Greeks Had a Word for It. An Outline of the Attestation, Distribution and Variability of Non-Indo-European Vocabulary in Ancient Greek, from Homer to Byzantium*. The University of Manchester (United Kingdom).

21   Lagarde, Paul Anton. (1866). *De novo testamento ad versionum orientalium fidem edendo*. Page 72, entry 182.

22   Powels, Sylvia. (1992). Indische Lehnwörter in der Bibel. *Zeitschrift für Althebraistik*, 5(2), 186–186.

23   Mayrhofer, Manfred. (1986). *Etymologisches wörterbuch des Altindoarischen*. 3 vols. Heidelberg: Carl Winter. Vol III, 485.

fricative like שׁ */s/.[24] The Sanskrit suffix *-iya* is entirely missing from other cognates, so is likely an innovation. On a circumstantial level, why Hebrew would have an Indian term for an Afghani stone is otherwise inexplicable. Instead of deriving Hebrew סַפִּיר *sappīr* from Sanskrit, a language with scant influence on Hebrew, Sanskrit शनिप्रिय *śanipriya* 'lapis lazuli' must be borrowed from Greek σάπφειρος *sappheiros*, which in turn was borrowed from Hebrew סַפִּיר *sappūr*.

4　　　　Marginal Cognates

The common Ancient Egyptian word for lapis lazuli was *ḫsbḏ* (also spelled *ḫsbd*) but the word *tfrr(t)* 'lapis lazuli' also occurs, albeit far less often. This term appears once as a verb *tfrr* 'to be lapis lazuli-like' in Ptolemaic-Roman period literary Egyptian.[25] Although the normative rendering is *tfrr(t)*, the peripheral spelling *tfrr* confirms that the first consonant was originally rendered with ⟨t̠⟩. In Old to Middle Kingdom Egyptian, ⟨t̠⟩ was probably pronounced as /ʧ/,[26] as Semitic */ʦ/ was generally rendered as *t̠* */ʧ/ in Ancient Egyptian. The spelling of the final consonant *-rr(t)* reflects the orthography /-ri/ from the Ramesseid period, when syllable-final /r/ was lost in native Egyptian words.[27] This indicates that *tfrr(t)* is a loanword, and indeed Egyptologists consider *tfrr(t)* to be a Semitic borrowing. That the sequence *-*pp-* was rendered into Ancient Egyptian with ⟨f⟩ instead of ⟨p⟩ is undoubtedly unusual. The sound change *p > *f* is an areal phenomenon attested much later in the languages of the Arabian peninsula.[28] Perhaps the Egyptian transcription reflects that sound change. Taken together, Egyptian *tfrr(t)* appears to be a Semitic loanword of a shape approximating that of סַפִּיר *sappīr*.

　　Ugaritic possessed two terms for lapis lazuli: *spr* and *ʾiqnʾu*, although the former took decades to be recognized in the Ugaritic lexical inventory. Ugaritic *spr* is clearly cognate to סַפִּיר *sappīr* and the other forms described in this chapter.

24　　Faber, Alice. (1985). Akkadian evidence for Proto-Semitic affricates. *Journal of Cuneiform Studies, 37*(1), 101–107.

25　　Schenkel, Wolfgang. (2007). Color terms in ancient Egyptian and Coptic. *Anthropology of Color. Interdisciplinary multilevel modeling, Amsterdam und Philadelphia*, 211–228.

26　　Personal correspondence with Dr. Doug Henning.

27　　Adrom, Faried. & Müller, Matthias. (2017). The Tetragrammaton in Egyptian Sources—Facts and Fiction. In J. van Oorschot & M. Witte (Ed.), *The Origins of Yahwism* (pp. 93–114). Berlin, Boston: De Gruyter. 100. https://doi.org/10.1515/9783110448221-005.

28　　Al-Jallad, Ahmad. (2013). Arabia and areal hybridity. *Journal of Language Contact, 6*(2), 220–242.

In Ford's[29] extensive study of Ugaritic *spr*, he discovered that *spr* is exclusively used a) in prose and b) to designate lapis lazuli (and not blue wool or another substance). This may indicate that *'iqn'u* was the earlier Ugaritic term for lapis lazuli and blue-dyed wool in both prose and poetry, whereas *spr* was later borrowed to designate the stone exclusively. Watson[30] also concluded that *spr* was a borrowing in Ugaritic, although he erroneously connects it with Sanskrit शानिप्रिय *śanipriya*.

An early Aramaic cognate is present in Papyrus Amherst 63, but the special circumstances of that document require some preliminary discussion to place it into context. Though written on a single sheet of papyrus, Papyrus Amherst 63 is a series of Aramaic documents written in Demotic script dating to the third century BCE. These were written by a community of Aramean migrants who had first resettled in Bethel, eventually moving to Egypt. As such, a borrowing from Classical Hebrew cannot be excluded by historical circumstances alone. The Aramaic cognate appears three times in Papyrus Amherst 63:[31]

	Demotic	Aramaic	Translation
1.	b.s.n [b] [.r.]m	*bsn [b] [r]	'from lapis lazuli'
2.	w.snm^m p.r.^m	*wsnmpr	'and lapis lazuli'
3.	s̄n̄br^m	*snbr	'lapis lazuli'

This form attests a few unique features. The unexpected *-n-* is due to dissimilatory pre-nasalization in Aramaic.[32] Demotic script distinguished between /p/ and /b/, so Demotic Aramaic *snbr* probably contained a voiced bilabial stop /b/. The irregular correspondence of Aramaic /b/ versus Hebrew and Ugaritic /p/ is suggestive of a loanword. From these Demotic transliterations, the underlying form *סנבר *snbr* may be reconstructed. What can be ascertained so far from these forms is that סַפִּיר *sappīr* is a borrowing, probably from a language to its east—in the direction from where lapis lazuli originated.

29 Ford, James Nathan. (2009). The Ugaritic letter RS 18.038 (KTU2 2.39) and the meaning of the term *spr* "lapis lazuli" (= BH סַפִּיר "lapis lazuli"). *Ugarit-Forschungen*, *40*, 277–338.

30 Watson, Wilfred GE, Dietrich, Manfried, & Loretz, Oswald. (2010). Non-Semitic words in the Ugaritic lexicon (8). *Ugarit-Forschungen*, *42*, 831–857.

31 Steiner, Richard C., & Nims, Charles F. (2017). The Aramaic Text in Demotic Script: Text, Translation, and Notes.

32 Garr, W. Randell. (2007). Prenasalization in Aramaic. *Studies in Semitic and Afroasiatic linguistics presented to Gene B. Gragg*, 81.

5 Akkadian Analogue and a Revised Etymology

Quiring[33] may be the only scholar to connect סַפִּיר *sappīr* with Akkadian *sipru* = ZA.GÌN 'lapis lazuli'. After he made the connection nearly seven decades ago, this important cognate was forgotten without cause. While no word *sipru* is found in the authoritative *Chicago Assyrian Dictionary*,[34] one does find a complex of words meaning 'lapis lazuli' with remarkable resemblance to Hebrew סַפִּיר *sappīr* and its cognates:

– *ṣipru*, referring specifically to lapis lazuli trim.
– *ṣipirtu* B (precious stone trim), plural *ṣiprētu*
– *ṣiprētu* (a dye), note that Akkadian texts often describe the color of dyed wool[35] by comparing them to precious stones.

These words must be connected to סַפִּיר *sappīr*, although the nature of that relationship isn't immediately obvious. Specialists in Akkadian etymologize *ṣipirtu* as a derivative of the Akkadian verb *ṣepēru* 'to strand (hair and linen), to dress (hair), to trim, to decorate (with stones), to trim away, to pinch(?)', yet this is incompatible with the borrowing into West Semitic languages on phonological grounds. The verb *ṣepēru* and related Akkadian words are rendered in the dictionaries with Akkadian *ṣ*, which corresponds to Hebrew צ, not ס. Yet the degree and form of polysemy in the verb *ṣepēru* is suspicious.

Grintz may have been first to suggest that סַפִּיר *sappīr* is an internal Semitic development from the root שׁ-פ-ר *š-p-r* 'to be fair', according to the ḳaṭṭīl pattern. The ḳaṭṭīl pattern forms adjectives and actant nouns in Classical Hebrew, neither of which suit the semantics of סַפִּיר *sappīr*. To the contrary, I suggested that *spr* was borrowed in Ugaritic in order to differentiate lapis lazuli proper from 'blue', the abstracted use of lapis lazuli. Neither does the initial sibilant of סַפִּיר *sappīr* correspond to the root שׁ-פ-ר *š-p-r*, which Grintz explains away by positing a(n unattested) variant root **ס-פ-ר 'to be fair'. Both stem and root require special pleading for Grintz's theory to be viable.

Noonan also maintains this etymology,[36] but attempts to circumvent the sibilant discrepancy by referring to Amorite names from the second millen-

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33   Quiring, Heinrich. (1954). Die Edelsteine im Amtsschild des jüdischen Hohenpriesters und die Herkunft ihrer Namen. *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften*, (H. 3), 193–213.

34   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry, *ṣipru* 3.

35   Thavapalan, Shiyanthi. (2016). Purple Fabrics and Garments in Akkadian Documents. *Journal of Ancient Near Eastern History*, 3(2), 163–190.

36   Noonan, Benjamin. J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Pages 346–347.

nium BCE containing an element from the root *s₁-p-r*.[37] The Amorite reflex of Proto-Semitic **š* is spelled with the cuneiform S-series, which usually indicates /t͡s/. In a recent treatment on the value of West Semitic phonemes in the Second Millennium BCE, Groen[38] notes that the underlying phonetic realization of the cuneiform S-series in Amoritic is unclear, but had it been /ʃ/, it would have been written with the available Š-series. He therefore concludes that Amorite ⟨s⟩ reflects /ʃ/. Gzella criticizes Noonan's solution on the grounds that the discrepancy in the sibilants should disqualify a derivation from שׁ-פ-ר *š-p-r*.[39] He too prefers the Indian origin from Sanskrit शनिप्रिय *śanipriya* 'lapis lazuli', which has been rightfully rejected.

Because Grintz, Noonan, and Gzella fail to offer a coherent case for deriving סַפִּיר *sappīr* from שׁ-פ-ר *š-p-r*, it is necessary to take a step back to ascertain whether this etymology is salvageable. It must be asked if there was a Bronze Age Semitic language in which PS **s₁* was realized as something approximating /t͡s/, so that PS **s₁* would be realized as ס in these languages. There is one and only one language in which such a correspondence occurs, and that is the Assyrian dialect of Akkadian.[40] By whatever sequence of phonological change, Assyrian "flipped" its sibilants relative to other dialects of Akkadian (and other Semitic languages of the time), so PS **s₁* was realized as /t͡s/. Thus we find Assyrian borrowings into Classical Hebrew with Akkadian [š] rendered as [ס], for example Neo-Assyrian *šaknu* 'governor' was loaned in Hebrew as סֶגֶן *seḡen* 'governor'.[41]

I propose that the cuneiform orthography may be hiding a completely separate root (**šepēru*) under *ṣepēru*. A cuneiform sign may be used to render more than one sequence of sounds, a phenomenon called *polyphoniety*.[42] For example, the Z-series of cuneiform signs are used to transcribe the affricates PS **/t͡s/* (corresponding to Hebrew ס), **/d͡z/* (corresponding to Hebrew ז), and **/t͡sʼ/* (corresponding to Hebrew צ). Ascertaining the actual sound value of a given Akkadian word contains an element of guesswork, based on cognates and borrowings into other languages. A Latin transliteration of a particular cuneiform

37   Noonan, Benjamin J. (2012). *Foreign loanwords and Kulturwörter in Northwest Semitic (1400–600 BCE): Linguistic and cultural contact in light of terminology for realia*. Hebrew Union College-Jewish Institute of Religion (Ohio). Page 95.

38   Groen, Jorik. (2016). On the Phonology of Second Millennium BCE Northwest Semitic. *Orientalia, 85*(1), 50–72.

39   Gzella, Holger. (2020). *Review of* [*Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact*]. Bibliotheca Orientalis 77, 3–4. 325–354.

40   Mankowski, Paul V. (2000). *Akkadian Loanwords in Biblical Hebrew*. Eisenbrauns. 156.

41   Ibid., 106–107.

42   Huehnergard, John. (2018). *A Grammar of Akkadian*. Brill. Page 70.

symbol or word will not necessarily accurately represent which phoneme was present. It would be impractical to track down every attestation of *ṣipru*, *ṣipirtu* B, or *ṣiprētu* in the Akkadian corpus to examine exactly which signs are used, this problem must be left to the specialists.[43]

If one were to consult the authoritative Akkadian dictionaries for such a word as Akkadian *špr 'lapis lazuli', he would return empty handed. Akkadian dictionaries are organized alphabetically (with entries Š, S, Z, and Ṣ ordered in separate volumes), so misreading *šipru*, *šipirtu* B, and *šiprētu* as *ṣipru*, *ṣipirtu*, and *ṣiprētu* respectively explains why Grintz and Noonan missed the obvious etymology. As such, a plausible historical scenario may be reconstructed. Lapis lazuli was exploited continuously from prehistory through the Semitic expansion into Mesopotamia until the present. The most ancient known term for lapis lazuli is the prehistoric cultureword represented by Sumerian ɢɪɴ 'blue' and Akkadian *uqnû* 'lapis lazuli',[44] closely followed by *ḫsbḏ* in Ancient Egyptian.

At a later point, Akkadian speakers innovated a new word for lapis lazuli from the verb *šepēru*, to which the Semitic cognates Arabic *s-f-r* س-ف-ر 'to rise (sun)' and Aramaic *š-p-r* שׁ-פ-ר 'to be beautiful'[45] are cognate. The Proto-Semitic meaning of this root *s₁-p-r evidently possessed some astronomical quality (as in Arabic *s-f-r* س-ف-ر 'to rise (sun)' and Assyrian *šipru* 'lapis lazuli') along with the quality of beauty. Perhaps the original meaning might have been 'to be radiant (said of the sky)'? An Akkadian etymology is materially supported by the historical reality of east to west trade of lapis lazuli, moving from its mines in Afghanistan to Canaan or across the Mediterranean.

Similar to the question of sibilant quality, gemination is not reflected in cuneiform orthography except in the most common words, ditto regarding long vowels. The cuneiform orthography may therefore be obscuring the correct value of the sibilant, the gemination of the medial consonant, and the length of the /i/. The most similar Akkadian form to the Western forms already examined is Akkadian **ṣipirtu (as it is spelled in the dictionaries), which must have had a geminated *-pp-* and long /i/, also hidden below the orthography. The existence of the *ḳaṭṭīl* stem in Hebrew סַפִּיר *sappīr* is probably phonotactic, as CiCCīC is

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43   Should my hypothesis that the sibilant in **ṣipirtu is *s₁ prove impossible, a less elegant solution exists. If Akkadian /t͡s'/ was first loaned into Egyptian of the early New Kingdom, it would have been rendered [t] /t͡ʃ/ because Egyptian lost ejectivity. The West Semitic languages would then have loaned *sappīr* from Egyptian. This scenario runs counter to the east to west trade (and tribute) of lapis lazuli, and should therefore be dispreferred.

44   Thavapalan, Shiyanthi. (2019). *The Meaning of Color in Ancient Mesopotamia*. Brill. 310.

45   Kogan, Leonid. (2015). *Genealogical Classification of Semitic*. de Gruyter. 387.

not permitted in Hebrew. In an intervocalic position, Neo-Assyrian *p shifted to /b/ as attested from Aramaic translations of Neo-Assyrian personal names.[46] Thus Aramaic *סנבר *snbr* was probably borrowed later than Hebrew סַפִּיר *sappīr* and Ugaritic *spr*. Egyptian *tfrr(t)* is an interesting form insofar as it preserves the feminine ending *-t* from Akkadian *ṣipirtu*, though it would have been pronounced as *-i* in the Egyptian of the New Kingdom.

A noun derived from Akkadian *šepēru* was the urforme of the Hebrew, Ugaritic, Egyptian, Aramaic, and Greek words. This offers a viable historical scenario for the spread of this word as well as explaining several of the more unusual quirks among these reflexes across languages. As *uqnû* became replaced by *šipru* in Akkadian, states that were dependent on Assyria for lapis lazuli slowly began to adopt this word into their languages. There was no reflex of *uqnû* in Ancient Israel, only possessing סַפִּיר *sappīr* as far as can be ascertained by the Biblical text. Thus, it may be concluded that Hebrew borrowed סַפִּיר *sappīr* 'lapis lazuli' from Assyrian Akkadian, which accords with the direction of the historical trade of lapis lazuli from Afghanistan to the west.

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46   Kaufman, Stephen Allan. (1970). *The Akkadian Influences on Aramaic and the Development of the Aramaic Dialects*. Yale University. 137.

יָהֲלֹם *Yāhălōm*

The identity of *yāhălōm* remains elusive because there is not enough known about this stone to suggest any identification with integrity. Despite the dearth of positive information that could contribute towards clinching a particular identification, it is worthwhile correcting previous proposals to avoid contaminating future publications. What is known is presented here.

Two slightly different vocalizations of יהלם appear in the Masoretic codexes, differing in the length of the first vowel. The standard form יָהֲלֹם is found in most masoretic manuscripts (Bomberg), but the Leningrad codex preserves the form יַהֲלֹם.

In Israeli Hebrew, יָהֲלֹם *yāhălōm* designates *diamond*. Diamonds are not a plausible identification for the biblical references. In the ancient world, diamonds were unknown in Ancient Egypt and Israel because they occurred only in India.[1] The Book of Exodus describes that the stones of the priestly breastplate inscribed, which would have been done using corundum (refer to Chapter 15 שָׁמִיר *Šāmīr*—Emery). Diamond has an absolute hardness of 1500, so is impervious to abrasion by corundum (*šāmīr*) which has an absolute hardness of 400.[2] The identification with diamond in Israeli Hebrew came about by folk etymologizing יָהֲלֹם *yāhălōm*, as if it was from the root ה-ל-ם *h-l-m* 'to hammer down, strike'.

Despite numerous proposed cognates from other ancient languages, no true cognate for יָהֲלֹם *yāhălōm* has been identified. In older literature, יָהֲלֹם *yāhălōm* is occasionally connected with Akkadian *elmēšu* and Arabic ألماس *'almās*. But this resemblance is superficial, as Akkadian *elmēšu* and Arabic ألماس *'almās* actually correspond to Hebrew חַלָּמִישׁ *ḥallāmīš* 'flint' (refer to Chapter 18 צֹר *Ṣōr* & חַלָּמִישׁ *Ḥallāmīš*—Flint/Obsidian for more information). Similarly, Heinrich Quiring's proposed connections with Akkadian *ḫulālu* and *elallu*[3] are phonologically and semantically difficult. These are not two words, but two forms

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1 Amar, Zohar, & Lev, Efraim. (2017). Most-cherished gemstones in the medieval Arab world. *Journal of the Royal Asiatic Society*, *27*(3), 377–401.

2 Mukherjee, Swapna (2012). *Applied Mineralogy: Applications in Industry and Environment.* Springer Science & Business Media. 373.

3 Quiring, Heinrich. (1954). Die Edelsteine im Amtsschild des jüdischen Hohenpriesters und die Herkunft ihrer Namen. *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften*, (H. 3), 193–213.

of single word which refers to an attractive limestone employed in the construction of monuments and carved into vessels,[4] not a precious stone. The Septuagint and Vulgate translate יָהֲלֹם *yāhălōm* with ἴασπις *iaspis*, which is found metastasized in *Antiquities of the Jews* and *Jewish War* with the entry for סַפִּיר *sappīr*. Pliny informs us that *iaspids* are a category of blue-green stones composed of a great number of mineral species. As a consequence, this translation does little to narrow the provenance or possible identity of this stone.

Given the lack of cognates outside of Hebrew, it is a last resort to concoct a Hebrew-internal etymology. One such etymology claimed by some scholars, despite the obvious semantic difficulties involved, posits יָהֲלֹם *yāhălōm* to be a Hebrew innovation from the "imperfect or *yiqtol* form of the verbal root ה-ל-ם [*h-l-m* 'to hammer down, strike']".[5] This etymology is impossible for several reasons. A nominal stem is required for a noun, such as the name of a precious stone. The "imperfect or *yiqtol*" is a verbal, not nominal, stem. The inability of those who cite this etymology to reasonably explain it speaks for itself.

There is some variation in the Aramaic targums as to the identity of יָהֲלֹם *yāhălōm*. Pseudo-Jonathan (Yerushalmi) to Exodus, Jerusalem Neofiti Targum Onkelos, and Pseudo-Jonathan (Yerushalmi) to Numbers render יָהֲלֹם *yāhălōm* with סַבְהֲלֹום *saḇhălōm* (some manuscripts: סִבְהֲלֹום *siḇhălōm*). However, no other cognate has been identified. The variation between -יְ in Hebrew and -סַב in Aramaic may signify two reflexes of a cluster **sw-*. In Proto-Northwest Semitic, initial **w-* shifted to *y-*. Aramaic preserved the initial sibilant, which protected the **w-*, and it may have interpreted medial **-w-* as *-b-*. Assuming the Aramaic word is not merely the first two consonants of the preceding word סַפִּיר *sappīr* reduplicated and corrupted, this positively indicates that both Hebrew *yāhălōm* and Aramaic are loans from a third source, probably a non-Semitic language. This is, however, speculative.

There overwhelming majority of Hebrew lithonyms are loanwords, and without a reasonable Hebrew-internal derivation, יָהֲלֹם *yāhălōm* probably adheres to this general trend. Which language it is loaned from is unclear. Due to a paucity of usages in the Hebrew Bible, ambiguous identifications offered by

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4   Dole, George F, & Moran, William L. (1991). A Bowl of *allalu*-stone. *Zeitschrift für Assyriologie und vorderasiatische Archäologie*, *81*(1–2), 268–273.

5   Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research*, *27*(1), 1–52.

the ancient translations, and a lack of known cognates, proposing any particular identification would be baselessly speculative. There simply is not enough information about this stone to suggest any identification with integrity. However, this overview was successful at ruling out many of the existing proposals in circulation.

לֶשֶׁם *Lešem*—Amazonite

The seventh stone on the High Priest's breastplate, לֶשֶׁם *lešem*, only found in the description of the breastplate in Exodus. The Septuagint translates לֶשֶׁם *lešem* with λιγύριον *ligurion* 'amber',[1] one of many byforms of λιγγούριον *lingourion* 'amber'. Targumic Aramaic קנכירין *qnkyryn* and its variants may be an Aramaic borrowing of Greek κέγχρος *kenchros* (allegedly 'a small kind of diamond'), probably referring to colorless corundum.[2] Colorless corundum was unknown in the ancient Levant, and would have been too hard to engrave with emery.

The 19th century German Egyptologist Heinrich Karl Brugsch proposed a relationship between Hebrew לֶשֶׁם *lešem* and Ancient Egyptian *nšmt*.[3] The identity of Egyptian *nšmt* would seem to hold the key to the identity of לֶשֶׁם *lešem*. Brugsch mistakenly identified *nšmt* with a light bluish feldspar on the basis of the *w3ḏ* (papyrus) scepter amulet found on Berlin Amulet Board. The Berlin Amulet Board is a collection of Ancient Egyptian amulets, mostly carved from precious stones, set in a labeled wooden board and housed in the Egyptian Museum of Berlin (labeled as artifact 20600). An inscription on the board indicates that the *w3ḏ* (papyrus) scepter amulet should be made of *nšmt*, which corresponds with the fact that the majority of *w3ḏ* charms listed in Petrie are carved from amazonite. This reckoning excludes *w3ḏ* amulets made of blue-green faience, which was intended to imitate amazonite. The *w3ḏ* scepter charm on the Berlin Amulet Board is allegedly a bluish feldspar, which requires further explanation.

Harris[4] is wise to caution that the composition of the particular examples on the board should not be taken too precisely. He suggests that "… it is clear that the names of materials carved on the board do not necessarily refer to the materials of the inserted amulets, but rather to the materials of which the

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1 Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research*, 27(1), 1–52.

2 Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums. Page 191.

3 Brugsch, Heinrich. (1867–1882). *Hieroglyphisch-Demotisches Wörterbuch*. 7 vols. JC Hinrichs. Leipzig.

4 Ibid, 15.

particular amulets should ideally be made."[5] That may be true, but it is also important to consider that the semantic range of our gemological terminology does not correspond exactly with Ancient Egyptian. The Ancient Egyptians did not conceptualize blue and green as separate basic colors,[6] so would not likely consider bluish and greenish feldspar to be different stones. Thus, the Berlin Amulet Board's claim that the *wꜢḏ* scepter charm should be made from *nšmt* is not contradicted by the presence of a bluish feldspar *wꜢḏ* charm instead of a greenish one.

Modern Egyptologists combined two lines of proof to arrive at the equation of *nšmt* with amazonite. As the majority of *wꜢḏ* amulets are amazonite, the Berlin Amulet Board would seem to indicate that *nšmt* was amazonite. Second, there is a small but useful body of references and comparisons to *nšmt* in the Egyptian textual corpus. For example, the Turin papyrus likens the sycomore tree to *nšmt*. The Egyptians even abstracted *nšmt* to refer to the color 'green' in general. This among other references indicates that *nšmt* was a green stone, which supports identification with amazonite. Additional textual refertences to *nšmt* are collected in Harris.[7]

Amazonite is an attractive green form of microcline feldspar, hence the geological name 'green feldspar'. Chemically, amazonite is $K(AlSi_3O_8)$, and the cause of green color in the stone is a matter of controversy.[8] From an archeological perspective, amazonite is an entirely reasonable identification for לֶשֶׁם *lešem*. Amazonite is not an uncommon find in the excavations of the Levant. Amazonite mines in the Eastern Desert of Egypt such as Gebel Migif and Gebel Hafafit provided a ready source of stones during the New Kingdom.[9] This is the primary candidate for the source of Israel's amazonite. Amazonite is attested in Egypt from earlier periods, but the sources are not yet known. Other ancient sources of amazonite in North Africa include Eghei Zuma in northern Tibesti, Libya (1st millennium BCE until the 1st millennium CE),[10] and Ethiopian amazonite (Neolithic),[11] but these sources are too early or late to be relevant.

5   Ibid.

6   Schenkel, Wolfgang. (2007). Color terms in ancient Egyptian and Coptic. *Anthropology of Color. Interdisciplinary multilevel modeling, Amsterdam und Philadelphia*, 211–228.

7   Harris, John Richard (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 115.

8   Mindat.org, entry: amazonite. www.mindat.org/min-184.html. Retrieved on 9 March 2023.

9   Harrell, James, & Osman, Ali Farrag. (2007). Ancient amazonite quarries in the Eastern Desert. *Egyptian Archaeology*, *30*, 26.

10   Zerboni, Andrea, Vignola, Pietro, Gatto, Maria Carmela, Risplendente, Andrea, & Mori, Lucia. (2017). Searching For the Garamantian Emerald: Reconsidering the Green-Colored Stone Beads Trade In the Ancient Sahara. *The Canadian Mineralogist*, 55(4), 651–668.

11   Zerboni, Andrea, Salvatori, Sandro, Vignola, Pietro, & Usai, Donatella. (2018). The long-

A posthumous paper by Carleton T. Hodge addressed the etymologies of several Hebrew *hapax legomena*.[12] He challenged the consensus equation between Hebrew לֶשֶׁם *lešem* and Ancient Egyptian *nšmt* on phonological grounds. He argued that Hebrew ⟨š⟩ should correspond to Egyptian ⟨s⟩ and that a Hebrew speaker would not have interpreted Egyptian /n/ as Hebrew /l/. Hodge's objections are based on misunderstandings of Ancient Egyptian. Egyptian sibilants did not precisely correspond to Hebrew sibilants. Egyptian ⟨š⟩ can be rendered by שׁ in Hebrew, as it does in שִׁטָּה 'acacia', loaned from Late Egyptian *šnd.t* 'acacia'. Likewise, Egyptian ⟨n⟩ often conceals the underlying phonological value /l/,[13] since Egyptian **n* dissimilated to /l/ in the vicinity of /m/[14] (as in other conditions). Egyptian ⟨nšmt⟩ is merely a transcription of the hieroglyphs, it is agnostic towards the pronunciation of the consonant we transcribe as ⟨n⟩, which was evidently /l/ in this word.

לֶשֶׁם *lešem* is a segolate-pattern noun, though which segolate pattern is less clear. The vowels correspond to both the *a*-segolate and *i*-segolate patterns (although they do not correspond to the *u*-segolate pattern, where a ḥolem would be expected for the first vowel). Because only the singular absolute form of *lešem* appears in the Bible, it is not clear if the etymological vowel is a short *a* or short *i*. The lack of a reflex in Hebrew for Egyptian *-t* is a product of Egyptian and Hebrew phonological development. The Egyptian feminine suffix *-t* (realized as *-at*) shifted to *-a* in the Middle Kingdom, and *-i* by the New Kingdom,[15] thus לֶשֶׁם *lešem* must have been loaned from Ancient Egyptian after the Middle Kingdom shift took place. Short vowels in the word-final position (like *-a* and *-i*) functioned as case markers which were later lost in Hebrew, so Hebrew clipped the reflex of the Egyptian feminine suffix *-t*, whether it was realized /a/ or /i/ at the time.

None of the ancient translations accurately identify לֶשֶׁם *lešem* as amazonite, which implies that its identity had been lost prior to the 3rd century BCE. Why the ancient translations used the translations they did to translate לֶשֶׁם *lešem*

distance exchange of amazonite and increasing social complexity in the Sudanese Neolithic. *Antiquity*, 92(365), 1195–1209.

12   Hodge, Carleton T. (1996). Some Hebrew Hapax Legomenon. *General Linguistics*. Vol. 36, Iss. 4, 271–296.

13   Loprieno, A. (1996). *Ancient Egyptian: a linguistic introduction*. United Kingdom: Cambridge University Press. Page 33.

14   Peust, Carsten. (1999). *Egyptian phonology: an introduction to the phonology of a dead language* (Vol. 2). Peust und Gutschmidt. 166.

15   Noonan, Benjamin J. (2016). Egyptian Loanword as Evidence for the Authenticity of the Exodus and Wilderness Traditions. *"Did I Not Bring Israel Out of Egypt?" Biblical, Archaeological, and Egyptological Perspectives on the Exodus Narrative*, 49–67.

is difficult to determine, perhaps the meaning 'amazonite' had already been lost by the 3rd century BCE. One might speculate that the demise of the mines at Gebel Migif and Gebel Hafafit ended access to amazonite in Ancient Israel, which resulted in the meaning of the word לֶשֶׁם *lešem* being lost. Regardless of the solution to that problem, it is clear that לֶשֶׁם *lešem* was borrowed from Ancient Egyptian *nšmt* 'amazonite', which implies that *lešem* should also be identified with amazonite.

שְׁבוֹ *Šəḇō*—Agate

שְׁבוֹ *šəḇō* may be the most straightforward stone on the Priestly Breastplate to identify, despite being a *dis legomenon* in the Hebrew Bible. Because שְׁבוֹ *šəḇō* has clear etymology and its cognates are described diagnostically in cuneiform texts, its identity may be securely established.

In 1886, Friedrich Delitzsch[1] connected Hebrew שְׁבוֹ *šəḇō* with Akkadian *šubû*. Since the 19th century, our understanding of Akkadian borrowings into Hebrew has advanced based on corpus comparison. Akkadian long final vowels were borrowed as /ō/ in Biblical Hebrew, whereas the penultimate /ə/ may reflect a shortening of the first vowel already operating in Akkadian.[2] The directionality of the relationship between Akkadian *šubû* and Sumerian *šuba* is controversial. Some scholars posited a Sumerian to Akkadian loan, others an Akkadian to Sumerian transmission, with the Akkadian form having been borrowed from a third source. In Sumerian, *šuba* refers to a precious stone, but it also means 'multicolored'. This provides an optimal Sumerian etymology for *šuba*: it is a noun concretized from the Sumerian adjective *šuba* '(to be) multicolored'.[3] Even though Sumerian -*a* is suggestive of (but importantly, not decisive) Akkadian loans into Sumerian, semantic and etymological considerations mitigate towards a Sumerian → Akkadian borrowing. Thus it may be said with confidence that the Hebrew word שְׁבוֹ *šəḇō* does indeed derive from Akkadian *šubû*,[4] itself borrowed from Sumerian *šuba*.[5]

In Akkadian texts, *šubû* was described as SIG₇/(w)*arqu* 'green-yellow', SA₅/*samu* 'red-brown',[6] BABBAR/*pēṣu* 'white'[7] in coloration. Given the assortment of color terms used to describe *šubû* in Akkadian texts, *šubû* must have

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1 Delitzsch, Friedrich. (1886). *Prolegomena eines neuen hebräisch-aramäischen Wörterbuchs zum Alten Testament*. JC Hinrichs, Lepzeig. Pages 84–86.

2 Mankowski, Paul V. (2000). *Akkadian Loanwords in Biblical Hebrew*. Eisenbrauns.

3 Pennsylvania Sumerian Dictionary, entry '*šuba* [MULTICOLORED]'.

4 Mankowski, Paul V. (2000). *Akkadian Loanwords in Biblical Hebrew*. Eisenbrauns.

5 Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry *šubû*.

6 Tawil, Hayyim. (2009). *An Akkadian lexical companion for biblical Hebrew: etymological-semantic and idiomatic equivalents with supplement on biblical Aramaic*. Ktav Publishing House. Entry 'שְׁבוֹ'.

7 Schuster-Brandis, A. (2003). Tupfen und Streifen: Erkenntnisse zur Identifikation von Steinnamen aus der Serie abnu šikinšu "Der Stein, dessen Gestaltung ...". *Altorientalische Forschungen*, *30*(2), 256–268.

been a multicolored type of gemstone, as its Sumerian etymon implies. One particular text provides the key to identifying the stone. *Abnu šikinšu* is an Akkadian lapidary which describes dozens of stone species by name and description. It is not completely extant, what remains has been pieced together from fragments. In a 2003 publication, Schuster-Brandis published and translated into German new fragments of *Abnu šikinšu*, including a description of *šubû* (written with the synonymous signs NA₄.MUŠ₃[8]) as:

10. The stone, the design of which (is as follows): like "a wound" of red wool, intertwined with white (it is): *šubû* is its name

11. The stone whose design (is as follows): it is striped red (and) white: *šubû* is its name.

12. The stone whose design (is as follows): its stripes are numerous: *šubû* is its name.

13. The *šubû*: like the underside of a finger (it is): *šubû zaqānu* is its name.[9]

In addition to the colors, this text describes *šubû* as being like a ball of yarn, striped, and like the friction ridges on the surface of human fingers. A ball of yarn, stripes, and finger ridges are descriptions of bands, and combined with the varying colors, indicates banded-agate—the conclusion reached by Schuster-Brandis. Agate properly defined refers to fibrous chalcedony (cryptocrystalline quartz, SiO_2) with bands of differing colors. The different colored bands are a result of several factors, including varying concentrations of different trace impurities, transparency, differing quartz phases, and macrostructural effects.[10] The striking appearance of multicolored banding enabled banded-agate to be treated as a precious stone.

Because there was no source for banded-agate in Egypt or Canaan, and שְׁבוֹ *šəḇō* was borrowed from Akkadian *šubû*, it stands to reason that Ancient Israel must have imported agate from Mesopotamia. Per the general trend with precious stones, agate doesn't occur in Mesopotamia itself, so it must have been imported from elsewhere, perhaps the Arabian Peninsula.[11] Agate was com-

8   Rubio, Gonzalo. "Reading Sumerian Names, I: Ensuhkešdanna and Baba." *Journal of cuneiform studies* 62.1 (2010): 29–43.

9   Schuster-Brandis, ibid.

10   Götze, Jens, Möckel, Robert, & Pan, Yuanming. (2020). Mineralogy, Geochemistry and Genesis of Agate—A Review. *Minerals*, 10(11), 1037.

11   Potts, Daniel T. (2007). Babylonian sources of exotic raw materials. *The Babylonian World*, 124–140.

monly used as a material for seals in Mesopotamia[12] and seal-making is mentioned in Mesopotamian descriptions of agate. In this capacity, Mesopotamia likely served as a critical intermediary in the trade of precious stones.

It has been incorrectly concluded that Akkadian *šubû* was loaned into Ancient Egyptian as *šby*,[13] a term previously known only from Papyrus Chester-Beatty I. Little is said of *šby* beyond an association with a seal, which is true of agate. But Meeks[14] demonstrated that the variant spelling *šꜣby* does not mean 'agate', rather it is an infrequent spelling of Egyptian *šbyw* 'necklace'. Egypt lacked an internal or nearby source of banded-agate, hence it is very unusual in Egyptian artifacts. Harris concluded that the Ancient Egyptian word for agate was *kꜣ*,[15] which does not appear to be related to a word for agate in any other language. See *Chapter 13* שֹׁהַם *Šōham* for further discussion of *kꜣ*.

Hebrew שְׁבוֹ *šəḇō* was borrowed from Akkadian *šubû* 'agate', which has been borrowed from Sumerian *šuba* 'multicolored, agate'. The identification with banded agate is clear given the assortment of color terms used to describe *šubû* in Akkadian texts. The description of *šubû* in *Abnu šikinšu* is also strongly indicative of banded agate. Finally, that the Greek translations render Hebrew שְׁבוֹ *šəḇō* with ἀχάτης *achates* 'agate'[16] (though Josephus' lists in *The Jewish War and Antiquities of the Jews* have ἀχάτης *achates* metathesized with ἀμέθυστος *amethystos* 'amethyst', the translation for אַחְלָמָה) would appear to show a continuing understanding of the meaning of this term into the third century BCE. Thus, שְׁבוֹ *šəḇō* can be confidently identified as banded-agate.

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12   Dalley, Stephanie. (1999). *Sennacherib and Tarsus*. Anatolian Studies, 49, 73–80.

13   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 183.

14   Meeks, Dimitri. (1997). Les emprunts egyptiens aux langues semitiques durant le Nouvel Empire et la Troisieme Periode Intermediaire: Les aleas du comparatisme. *Bibliotheca orientalis*, *54*(1), 32–61.

15   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 133–134.

16   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

אַחְלָמָה ʾaḥlāmā—Red Jasper

Most scholars identify אַחְלָמָה ʾaḥlāmā with amethyst, but this equation is fraught. While it is true that the Septuagint and its derivative translations[1] translate אַחְלָמָה ʾaḥlāmā with ἀμέθυστος amethystos 'amethyst', אַחְלָמָה ʾaḥlāmā is borrowed from Egyptian ḥnmt, which referred to a specifically red gemstone. Theban Tomb 84 depicts a basket containing red objects labeled mḥnmt,[2] mitigating against an identification with amethyst. The consensus among Egyptologists has coalesced around identifying mḥnmt with red jasper. Although red jasper is well-attested in Egyptian artifacts, there is a dearth of known sites from which it was exploited. Ancient sources report that mḥnmt came from Pwnt, Coptos, Nubia, and Toski.[3] Red jasper is found in Egypt in the Eastern Desert, though no mine is currently known.[4] Yet the picture is not so simple.

With jasper in particular, conceptual differences between modern and ancient man create an interpretive hurdle. The English semantic category of 'jasper' refers to an aggregate of different phases of quartz (SiO_2). The ancients, who had a far more limited understanding of chemistry and crystal structure, conceptualized different colors of jasper as separate gemstones. Thus in the Ancient Egyptian language and corresponding thought, mḥnmt referred to 'red jasper' classified separately from nmḥf 'green jasper'[5] and other jaspers. In the case of jasper, Ancient Egyptian categorically divides gemstones that modern man would lump together.

For us moderns, this was frustratingly not always the case. Modern gemologists treat carnelian and red jasper as separate gemstones, composed of different phases of quartz. But because color was such a salient factor in the categorization of gemstones by the ancients, mḥnmt could be applied to carnelian and red jasper, which has resulted in confusion in the Egyptological literature. In other words, 'red jasper' is a correct yet imperfect translation of mḥnmt. The primary Ancient Egyptian word for carnelian is ḥrst, which does not appear to have been loaned out. The fact that אַחְלָמָה ʾaḥlāmā is borrowed from mḥnmt is

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1   Some of the translations have the list of stones reordered.
2   Davies, Nina M. (1942). Nubians in the Tomb of Amunedjeh. *JEA*, *28*, 50–52.
3   Harris, Ibid. 113.
4   Harrell, James A. (2012). Gemstones. *UCLA Encyclopedia of Egyptology*, *1*(1).
5   Harrell, James A. (2012). Gemstones. *UCLA Encyclopedia of Egyptology*, *1*(1).

insufficient to tell us which species the Israelites would have identified אַחְלָמָה
'aḥlāmā with. The examples provided here illustrate the problem.

Records from the Egyptian town of Wah-sut record regular importation of
several precious stones, including ḥnmt. Only red jasper has been unearthed
in excavations that could reasonably be identified with ḥnmt, which occurs in
copious quantities, both worked and unworked.[6] The Berlin Amulet Board is
a collection of Ancient Egyptian amulets housed on a labeled wooden board,
housed in the Egyptian Museum of Berlin and labeled as artifact number
20600. The Knot of Isis (tyt) amulet is described by the board is prescribed to
be composed of ḥnmt, but the example on the board is composed of 'dark car-
nelian' in actuality.[7] However, most examples of tyt amulets are in fact made
of red jasper.[8] To reconcile this contradiction, it has been suggested that either
the Berlin Amulet Board's prescriptions intend the "ideal" material for a given
amulet.

The Stela Ridge mines in the western Nubian Desert are the only known
source of naturally occurring carnelian in Ancient Egypt, and they were exploit-
ed exclusively during the Middle Kingdom. A stela erected at the site indirectly
describes the product being extracted from the mine as ḥnmt, by describing
Hathor as 'Lady of ḥnmt'.[9] It was common for Egyptian miners to give Hathor
the title "Lady of (stone)", in accordance with the stone the mine produced.
These mines produced carnelian, sardonyx and a pale blue-gray chalcedony.[10]
The carnelian and sardonyx must be what is being referred to by ḥnmt, while
the pale blue-gray chalcedony was evidently not important enough to merit a
mention on the inscription.

Though mḥnmt refers to red jasper and carnelian, it may be possible to
deduce neater semantic boundaries. The Stela Ridge mine was the only mine in
Egypt known to produce red carnelians, and it only operated during the Middle
Kingdom. While some carnelian was certainly imported, the majority was likely
produced by heat treating dull-colored chalcedonies. This implies a possible
three-part conceptual distinction between red jasper/natural carnelian/heat-
treated carnelian. While modern man groups natural and heat-treated car-
nelian together, Egyptians would be more likely to group the natural stones

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6   Justl, Shelby. (2016). Special Delivery to Wah-sut: An Eighteenth Dynasty Ostracon's Inven-
     tory of Precious Materials. *Journal of the American Research Center in Egypt*, 255–268.
7   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doc-
     toral dissertation, University of Oxford). Akademie Verlag—Berlin. 123.
8   Ibid, 123–124.
9   Lebedev, M.A. (2006). Stela Nubia Museum 59485: the last known expedition of the early
     Middle Kingdom beyond the Nile Valley. *Journal of Social Archaeology*, 6(2), 293.
10   Personal correspondence with Dr. James Harrell.

(red jasper and natural carnelian) together. Under this schema, ḥrst may refer exclusively to heat-treated carnelian. Semites, without a source of red jasper, carnelian, or chalcedony to heat-treat, would have grouped the stones based on appearance rather than source. Under their system, אַחְלָמָה ʾaḥlāmā was restricted to red jasper, and ʾōḏem applied more broadly to all carnelian, akin to the modern system. This is most likely the system that the Israelites inherited.

1   Phonology

A connection between Hebrew אַחְלָמָה ʾaḥlāmā and Ancient Egyptian mḥnmt has been known since Brugsch in 1867.[11] The primary form of this word in Egyptian is mḥnmt, the byform ḥnmt with the dropped m-preformative reflects a common phenomenon in Egyptian nouns. The orthographic interchange of forms with and without m- preformative in many Egyptian words has been explained as conditioned nasal devoicing.[12] Brugsch[13] further suggests that mḥnmt is derived etymologically from the Egyptian verb ḥnm 'delight',[14] as red was abstractly associated with ḥnm 'delight' by the Egyptians.

Because no trace of m- has been left in אַחְלָמָה ʾaḥlāmā, the Hebrew word must have been borrowed from the byform ḥnmt. Thus the initial ʾa- would seem to be a classic example of a prosthetic vowel in Hebrew. The predicted Egyptian consonant cluster /χl-/ did not agree with Biblical Hebrew phonotactics, so a prosthetic /a-/ was inserted at the beginning of the word to break the consonant cluster into two syllables. As the Egyptian donor is rendered with [ḥ], in this case Hebrew ח indicates the voiceless uvular fricative which existed before it merged into the pharyngeal fricative during the 1st century BCE.[15] The dissimilation of *n > l in the neighborhood of m is extensively documented in Ancient Egyptian,[16] so the historical pronunciation of the [n] in ḥnmt was evidently with /l/.

11   Brugsch, Heinrich. (1867–1882). *Hieroglyphisch-Demotisches Wörterbuch.* 7 vols. JC Hinrichs. Leipzig.

12   Takács, Gábor. (2007). *Etymological Dictionary of Egyptian: Volume Three: m.* Brill. 209.

13   Ibid.

14   Ibid., vol. III. 292.10.

15   Steiner, Richard C. (2005). On the Dating of Hebrew Sound Changes (*Ḫ > Ḥ and *Ġ > ʿ) and Greek Translations (2 Esdras and Judith). *Journal of Biblical Literature*, 124(2), 229–267.

16   Peust, Carsten. (1999). *Egyptian phonology: an introduction to the phonology of a dead language* (Vol. 2). Peust und Gutschmidt. 166.

The Egyptian feminine suffix *-t* (probably *-at*) shifted to *-a* in the Middle Kingdom, and *-i* by the New Kingdom.[17] It would therefore be reasonable to posit that אַחְלָמָה *ʾaḥlāmā* was loaned from Egyptian before the Middle Kingdom shift took place, and the Egyptian feminine ending *-at* was reinterpreted by Semitic speakers as the Semitic feminine ending *-at* (both deriving from proto-Afrasian **-at*), which was shifted to *-ā* in Hebrew. Considering the final syllable *-mat*, the first syllable must have been open, and so the /a/ following χl- must have been long because in Ancient Egyptian, vowels were always long in open stressed syllables.[18] Egyptian /a:/ shifted to /o:/ after the reign of Ramses II in the Nineteenth dynasty,[19] which makes it possible to pinpoint when this word was loaned. Also notable is that this implies that *ḥnmt* was loaned at a time in which the Canaanite Shift was no longer productive, because otherwise **ō* would appear in Hebrew.

2   Ancient Translations

While אַחְלָמָה *ʾaḥlāmā* has traditionally been translated as 'amethyst' based on the Greek and Latin translations, but the ancient Greek term ἀμέθυστος *amethystos* does not map perfectly onto the modern mineral amethyst. When gemologists discuss amethyst, they refer to a purple variety of quartz (SiO_2). But garnet, the most popular gemstone of the Greco-Roman period, comes in many different colors and thus varieties. Pliny mentions that the most valuable variety of *carbunculus* 'garnet' was amethyst-colored.[20] This is probably because amethyst was quite rare until the discovery of massive quantities in Brazil, and so garnets that resembled amethyst would be quite valued as a substitute.

A piece of supporting evidence was found inscribed on a tablet found at Ugarit, containing a treaty between Ugarit and the Hittite Empire. In Akkadian, the phrase *sig₂ za.gin₃ ḫašmāni* is rendered as *pḥm* and *ʾiqnʾi* 'garnet and lapis lazuli' in Ugaritic. Though metastasized, the scribe equates Akkadian *ḫašmāni* 'amethyst' with Ugaritic *pḥm* 'garnet'. Therefore, the possibility that ἀμέθυστος *amethystos* intends 'amethystine garnet' should not be discounted, perhaps

17   Noonan, Benjamin J. (2016). Egyptian Loanword as Evidence for the Authenticity of the Exodus and Wilderness Traditions. *"Did I Not Bring Israel Out of Egypt?" Biblical, Archaeological, and Egyptological Perspectives on the Exodus Narrative*, 49–67.

18   Loprieno, A. (1996). *Ancient Egyptian: a linguistic introduction*. United Kingdom: Cambridge University Press. 36.

19   Ibid, 38.

20   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 25.

hinting at a gradual shift from *red jasper → red garnet → violet garnet*. The Septuagintal translation with ἀμέθυστος *amethystos* and the etymology from *mḥnmt* 'red jasper, natural carnelian' may be reconciled.

The Aramaic translations all translate אַחְלָמָה *ʾaḥlāmā* with something like עין עגלא *ʕyn ʕgla'* (literally, 'calf's eye'). This would be a description of the so-called eye-stones, banded gemstones which have been rounded to appear like an eye.[21] During the medieval period, concern regarding the Evil Eye and remedies in the form of talismen (*nazars*) spread around the Muslim world. Stone amulets carved from quartzes were engraved to have circular patterns. Red jasper is particularly appropriate for this purpose, as its deep red color creates a striking appearance when rounded into an "eye". The Arabic translation of the Samaritan Pentateuch rendered אַחְלָמָה *ʾaḥlāmā* with Arabic بَهْرَمَان *bahramān*, allegedly a reddish stone. Whether this is based on an actual tradition, guesswork, or an arbitrary translation is unclear.

Hebrew אַחְלָמָה *ʾaḥlāmā* is borrowed from Ancient Egyptian *ḥnmt*. Although the meaning of *ḥnmt* is blurry at times, occasionally including natural carnelian, it primary meaning would appear to be red jasper. It is difficult to determine if this identification carried into the 3rd century BCE, as none of the ancient translations explicitly support an identification with red jasper, but the Greek, Aramaic, and Samaritan translations may all reflect an underlying tradition. Nevertheless, it is difficult to know with certainty.

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21   Hyllested, Adam. (2017). *Armenian gočazm 'blue gemstone' and the Iranian evil eye*. Usque Ad Radices. Indo-European Studies in Honour of Birgit Anette Olsen.

תַּרְשִׁישׁ *Taršīš*—Amber

Taršīš is particularly notable because it appears in contexts far beyond the Priestly Breastplate. Because Tartessos, the ancient name for the area approximately equivalent to Andalusia, is also rendered as תַּרְשִׁישׁ *taršīš* in Hebrew, philologists ancient and modern alike have assumed that this stone must have come from Andalusia. But textual evidence from the Bible which narrows the identity תַּרְשִׁישׁ *taršīš* to a single stone implicates this reasoning as mistaken. Archeogemological evidence will indicate the identity and origin of *taršīš*-stone, and four distinct but etymologically related meanings for the Hebrew word תַּרְשִׁישׁ *taršīš* will be unraveled.

There is no gemstone called תַּרְשִׁישׁ *taršīš* or anything related to it outside of Hebrew. Without cognates, it is difficult to determine the identity of תַּרְשִׁישׁ *taršīš*. The problem is exacerbated by the fact that the word תַּרְשִׁישׁ *taršīš* has been etymologized in at least four distinct ways in the previous literature. Because תַּרְשִׁישׁ *taršīš* does not have a cognate in any other ancient language, it is most likely to be a case of internal development. The Septuagint Pentateuch translates *taršīš*-stone as χρυσόλιθος *chrysolithos* (literally, 'gold stone'), which contemporary scholars struggle to identify. Older literature translates χρυσόλιθος *chrysolithos* as *topaz*, but Von Heinrich Quiring[1] and Harrell[2] note that topaz was unknown in antiquity, and therefore χρυσόλιθος *chrysolithos* must be citrine. Reasoning along the same lines, Thoresen[3] prefers hessonite. But neither citrine[4] nor hessonite[5] were known in the ancient Levant prior to the Roman period. Daniel 10:6, Ezekiel 1:16, and Song of Songs 5:14 transliterate תַּרְשִׁישׁ *taršīš* into Greek as θαρσις *tharsis*, indicating uncertainty as to this stone's identity.

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1   Quiring, Heinrich. (1954). Die Edelsteine im Amtsschild des jüdischen Hohenpriesters und die Herkunft ihrer Namen. *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften*, (H. 3), 193–213.

2   Harrell, James A. (2011). Old Testament Gemstones: A philological, geological, and archaeological assessment of the Septuagint. *Bulletin for Biblical Research*, 21(2), 141–171.

3   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

4   Harrell, James A. (2012). Gemstones. *UCLA Encyclopedia of Egyptology* 1.1.

5   Thoresen, ibid.

1   Internal Evidence for the Color of *Taršīš*-Stone

There is an important clue to the identity of *taršīš*-stone in the biblical text
itself. At the end of the Hebrew Bible, the text hints at the color of תַּרְשִׁישׁ *taršīš*.
Daniel 10:5–6 provides evidence that indicates that תַּרְשִׁישׁ *taršīš* is a luminous
and warm-colored stone:

<div dir="rtl">

וָאֶשָּׂא אֶת־עֵינַי וָאֵרֶא וְהִנֵּה אִישׁ־אֶחָד לָבוּשׁ בַּדִּים וּמָתְנָיו חֲגֻרִים בְּכֶתֶם אוּפָז

</div>

> I looked and saw a man dressed in linen, his loins girded with gold (כֶּתֶם)
> of *Uphaz*.

<div dir="rtl">

וּגְוִיָּתוֹ כְתַרְשִׁישׁ וּפָנָיו כְּמַרְאֵה בָרָק וְעֵינָיו כְּלַפִּידֵי אֵשׁ וּזְרֹעֹתָיו וּמַרְגְּלֹתָיו כְּעֵין נְחֹשֶׁת קָלָל
וְקוֹל דְּבָרָיו כְּקוֹל הָמוֹן

</div>

> His body was like *taršīš* (תַּרְשִׁישׁ), his face had the appearance of lightning
> (בָרָק), his eyes were like torches of fire (לַפִּידֵי אֵשׁ), his arms and legs had
> the color of burnished bronze (נְחֹשֶׁת), and the sound of his speech was
> like the noise of a multitude.

The four other concrete nouns describing the flesh of this "man" all emit (or
reflect, in the case of gold) light and exhibit a yellow-orange color: gold (כֶּתֶם
ketem), lightning (בָרָק *bārāḵ*), fire (אֵשׁ *ʔēš*), and bronze (נְחֹשֶׁת *nǝḥōšet*). Extrap-
olating from this series of entities, *taršīš* must be a luminous and warm-colored
(red-orange-yellow) stone.

2   Taršīš = Tartessos = A Stone from Tartessos

Most scholars connect תַּרְשִׁישׁ *taršīš*-stone with תַּרְשִׁישׁ *Taršīš*, a locale men-
tioned throughout the Hebrew Bible which became confused over time. In
recent years, תַּרְשִׁישׁ *taršīš* has been securely demonstrated beyond a shadow
of doubt to be located in modern-day southern-Iberia,[6] now called Andalu-
sia. One piece of textual-archeological evidence is particularly illuminating in
this regard. Ezekiel 27:12 (lived 7th–6th centuries BCE) records that Tyre traded

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6   López-Ruiz, Carolina. (2009). "Tarshish and Tartessos Revisited: Textual Problems and Histor-
     ical Implications." In: *Colonial Encounters in Ancient Iberia: Phoenician, Greek, and Indigenous
     Relations*.
     Lipinski, Edward. (1988). Carthage et Tarshish. *Bibliotheca orientalis*, *45*(1–2), 60–81.

with *Taršīš* for silver, but laments the end of the Tartessian silver trade. Isotopic analysis of silver recovered from excavations demonstrates that Iberia was the primary source of silver until the latter half of the seventh century BCE,[7] matching Ezekiel's description.

תַּרְשִׁישׁ *Taršīš* is clearly related to Greek Ταρτησσός *Tartessos*, reflexes of a shared (but unattested) native name. Proto-Semitic *ϑ and *s_1 developed into שׁ and word-final geminates degeminate in Hebrew, so the native name of Tartessos must have been something like *$Tar\vartheta iss$. The ending *-iss is similar to that of other Paleohispanic toponyms recorded in coin legends (Aŕatis, Bilbilis, Oŕośis, Otatiiś, and Segobris).[8] It is unreasonable to search for a Semitic etymology, as does Albright (allegedly loaned from Akkadian *rašāšu 'to smelt, refine'[9]). The earliest references in Greek sources to Ταρτησσός *Tartessos* describe it as a one location among several in what is now Spain-Portugal, along with the Mastienoi/Mastianoi and Iberia. It is not clear if Ταρτησσός *Tartessos* originally referred to an ethnicity, which became applied to the country.[10] Little trace of the original ethnic nature of the Tartessians remains in biblical sources outside of the Table of Nations in Genesis. That this is the original meaning of תַּרְשִׁישׁ *taršīš* is apparent from the probable Tartessian origin of the name.

Having located תַּרְשִׁישׁ *Taršīš* in southern Iberia, many Hebrew philologists have researched which species of (gem)stones are found in that area. This has a solid linguistic basis to it: precious stones are often named for the places from which they originate. Haupt suggests that *taršīš*-stone referred to "ruby-like crystals of cinnabar from the quicksilver mines of Almaden in southern Spain"[11] based on the provenance of cinnabar in the Roman world and the Septuagintal translation of χρυσόλιθος *chrysolithos*.[12] Whereas Pliny does mention that χρυσόλιθος *chrysolithos* imparts on gold a silvery color,[13] that is due to the contrast between gold and the even deeper color of peridot, the true identity of

7   Eshel, Tzilla, Erel, Yigal, Yahalom-Mack, Naama, Tirosh, Ofir, & Gilboa, Ayelet. (2022). From Iberia to Laurion: Interpreting Changes in Silver Supply to the Levant in the Late Iron Age Based on Lead Isotope Analysis. *Archaeological and Anthropological Sciences*, 14(6), 120.

8   Noonan, Benjamin. J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Pages 228–229.

9   Albright, William F. (1941). New light on the early history of Phoenician colonization. *Bulletin of the American Schools of Oriental Research*, 83(1), 14–22.

10   Pérez, Sebastián Celestino, & López-Ruiz, Carolina. (2016). *Tartessos and the Phoenicians in Iberia*. Oxford University Press. 26–30.

11   Haupt, Paul. (1907). Jonah's Whale. *Proceedings of the American Philosophical Society*, 46(185), 151–164.

12   Haupt, Paul. (1907). *Biblische Liebeslieder*. Leipzig. 59. (German).

13   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, Chapter 42.

χρυσόλιθος *chrysolithos*. Χρυσόλιθος *chrysolithos* never referred to cinnabar, and cinnabar has never been used as a precious stone. The primary use of cinnabar in the ancient world was as a pigment, and its first known usage in Israel was found in Roman-era site in this capacity.[14]

Tartessos was known in ancient times for its metal ores.[15] Of particular interest is the Iberian Pyrite Belt along southern Spain, which produces attractive specimens of pyrite (FeS_2) and chalcopyrite ($CuFeS_2$). Assuming that *taršīš*-stone must come from Tartessos, Noonan[16] offers two possibilities as to the identity of *taršīš*-stone. Based on the availability of pyrite, Noonan offers pyrite as one possibility. Pyrite was well known to the Mesopotamians under the name [NA4]*pindar*. Pyrite and related ores were melted for their metal content or used to light fire, but were not valued as a precious stone in the bronze age. This was probably due to a number of issues, including the reactivity of the ores, fragility and the corresponding difficulty in engraving. As an alternative, he suggests "chrysolite", but it is not clear which gemstone he has in mind.[17] The mines of the Iberian Pyrite Belt may also produce attractive blue-green salts, as the presence of iron and copper ores would imply. Tartessos was not known as a source of gemstones in the ancient world, which makes this line of reasoning difficult.

3 Applying the Philological Method

Not all scholars connect *taršīš*-stone with Tartessos. Based on the color suggested in Daniel, Harrell et al.[18] suggested a novel etymology, seeing an Akkadian verb *rašāšu* in *taršīš*. *Rašāšu* and the words derived from it are used in Akkadian texts to describe the appearance of gold, bronze, divine garments, royal/divine radiance, (rarely) beer, pigs, and urine. They prefer to identify *taršīš*-stone with amber, based on the color implied in Daniel, the color implied from their etymology, and by positing metathesis with the Septuagint's trans-

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14   Koren, Zvi C. (2014). Scientific study tour of ancient Israel. In *Science History: A Traveler's Guide* (pp. 319–351). American Chemical Society.

15   Jurado, Jesús Fernández. (2002). The Tartessian economy: Mining and metallurgy. *The Phoenicians in Spain*, 241–262.

16   Noonan, Benjamin. J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Pages 228–229.

17   Chrysolite is sometimes used to refer to yellowish olivines, which do not occur in Spain.

18   Harrell, James E., James K. Hoffmeier, and Kenton F. Williams. "Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis." *Bulletin for Biblical Research* 27.1 (2017): 25.

lation for לֶשֶׁם *lešem*, λιγύριον *ligyrion* 'amber'. Meyers[19] adopts this etymology, and by misreading the last phrase in Ezekiel 10:9 as "like the stone eye of tarshish",[20] concludes that *taršīš* is tiger's eye. Beyond the strained reading required to justify this identification, tiger's eye is not found in the Levant, and was unknown in antiquity. Though its origin in Europe is obscure, tiger's eye became abundant in the 1880's with the discovery of massive deposits in Griqualand West, South Africa.[21]

While the argument to derive *taršīš*-stone from the root *r-š-š* is reasonable on semantic and phonological grounds, it is historically problematic. The root *r-š-š* is only attested in Akkadian, as it was denominated from the Akkadian color term *ruššû*, which was itself loaned from Sumerian *ḫuš.a* during the Middle Babylonian period.[22] Whereas *ruššû* fits the color of *taršīš*-stone described in Daniel, because it is an Akkadian derivative of Sumerian, *ruššû* or *rašāšu* would be required either to have been loaned into Hebrew (either directly or through Aramaic) and used as the root in a *t*-preformative noun to form *taršīš*, or a *t*-preformative noun be created in Akkadian from *rašāšu* to create **NA4*taršīš*, which would then be loaned into Hebrew. As the asterisk indicates, no such word exists in Akkadian. Thus, this etymology too strains credulity.

The evidence from Daniel as to what color *taršīš* must be is more resolved. To be a possible identification for *taršīš*, a gemstone must be luminous, warm-colored, known to the ancient Israelites, and not reliably linked to another stone on the Priestly Breastplate. This immediately rules out any blue-green metal salts from the Pyrite belt. As carnelian (אֹדֶם *ʾōḏem*), red jasper (אַחְלָמָה *ʾaḥlāmā*), and garnet (כַּדְכֹּד *kaḏkōḏ* and אֶקְדָּח *ʾeḳdāḥ*) are already identified with other terms in Classical Hebrew, there is no red gemstone left to identify with *taršīš*. Topaz[23] and tiger's eye were undiscovered in antiquity, and neither citrine[24] nor hessonite[25] were known in the Levant prior to the Roman period.

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19   Meyers, Stephen C (2021). *Gemstones of Aaron's Breastplate and the Urim & Thummim*.

20   The Hebrew text here is וּמַרְאֵה הָאוֹפַנִּים כְּעֵין אֶבֶן תַּרְשִׁישׁ "and the appearance of the wheels, like the appearance of *taršīš*-stone".

21   Heaney, Peter J, & Fisher, Donald M. (2003). New interpretation of the origin of tiger's-eye. *Geology*, 31(4), 323–326.

22   Thavapalan, Shiyanthi. (2019). *The meaning of color in ancient Mesopotamia*. Brill. Page 122.

23   Quiring, Heinrich. (1954). Die Edelsteine im Amtsschild des jüdischen Hohenpriesters und die Herkunft ihrer Namen. *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften*, (H. 3), 193–213.
     Harrell, James A. (2011). Old Testament gemstones: A philological, geological, and archaeological assessment of the Septuagint. *Bulletin for Biblical Research*, 21(2), 141–171.

24   Harrell, James A. (2012). Gemstones. *UCLA encyclopedia of Egyptology*, 1(1).

25   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and

There is calcite that occurs in yellows and oranges in Israel, but there is no evidence that these were used as a gemstone. Likewise, pyrite and chalcopyrite were known and used as ores, but not employed as gemstones.

As already mentioned, amber is the preferred identification of Harrell, et al.[26] Even though the proofs by which they came to their conclusion were slightly off, the suggestion that *taršīš* intended amber is almost certainly correct on archeological grounds. Amber may not be an obvious identification as it was seldom used in antiquity to make seals because it is soft and would quickly abrade given typical use (gem-quality amber has a variable Mohs scratch hardness ranging between 1 and 3). However, there is a crucial detail: although the gemstones on the breastplate were engraved like seals, they weren't actually used for sealing, so the fragility of amber is irrelevant.[27] It may not be the only one, there are three possible amber seals known from Mycenaean Greece,[28] perhaps intended for a cultic function. No other stone fits the criteria of *taršīš*, and no other word has been plausibly linked with amber despite its ubiquity in the Late Bronze Age Levant.

A cornucopia of ancient words for amber are recorded in Pliny.[29] Of particular interest is the (Late) Egyptian term *sacal*, a Latin transliteration of the Egyptian word *škl*, which referred to a resin used in a medicinal ointment. Deriving this term from the endonym of the Sicilians[30] (the Sea People group called the *Šꜣkrwšꜣꜣ* in Egyptian texts) is clever, but is impeded by the fact that Egypt did not acquire their amber from Sicily. Rather, Egyptian *škl* must be borrowed from Akkadian ^NA4^*sankallu*/*sagkallu*, in turn borrowed from Sumerian ^NA4^*saŋkal* 'amber'. Sumerian ^NA4^*saŋkal* has a transparent Sumerian etymology, a conjunction of *saŋ* 'head, person, capital' + *gal* 'great', thus 'preeminent stone'. It is important to add that *saŋkal* is mentioned in the Amarna letters as a tribute item given from Mitanni to Egypt.[31] Hittite ^NA4^*ḫušt(i)*- may also refer to 'amber',

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their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

26   Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research*, *27*(1), 1–52.

27   Harrell, James A. (2011). Old Testament gemstones: A philological, geological, and archaeological assessment of the Septuagint. *Bulletin for Biblical Research*, *21*(2), 141–171.

28   Hughes, Konrad Bennett. (2020). *Mycenaean Amber: Within the Exchange Network of Mercenaries and Metals*.

29   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 11.

30   McKenny Hughes, Thomas. (1901). Amber. *Archaeological Journal*, 58(1), 35–46.

31   Singer, Graciela Noemi Gestoso. (2016). Amber exchange in the Late Bronze Age Levant

a blend of PIE *h_2us-t- and *h_2eus-t- meaning *'goldness'. Hittite ᴺᴬ⁴ḫušt(i)- was loaned into Hurrian.[32]

Amber is not considered a single mineral by geologists, but a catch-all for solidified fossilized resins.[33] Two forms of amber are known from archeological excavations in the Levant, which indicate that amber was well-known to Bronze Age Semites. The first is the native Lebanese amber, which is quite poor in quality and seldom used for jewelry today. It was minimally exploited for jewelry in antiquity. The second and far more important form of amber is Baltic amber, which is archaeologically abundant in the late second-first millennium BCE Levant[34] and was used more extensively in jewelry. The provenance of Baltic amber (namely, the Baltic Sea) necessitates that this stone must have been transported from the Baltics to Israel. Hebrew תַּרְשִׁישׁ *taršīš* is entirely unrelated to Sumerian ᴺᴬ⁴*saŋkal* and Hittite ᴺᴬ⁴ḫušt(i)-, the two ancient culturewords for amber. The linguistic origin and textual references to Sumerian ᴺᴬ⁴*saŋkal* and Hittite ᴺᴬ⁴ḫušt(i)- concentrate around the source of Lebanese amber, namely Lebanon to southwestern Syria.

In the Levant, imported Baltic amber began to displace native Lebanese amber[35] starting in the 14th century BCE. In *The Odyssey*,[36] Homer implies that the Phoenicians were the intermediary in the pan-Mediterranean amber trade. This claim is supported by the discovery of amber in the cargo hold of a sunk Phoenician vessel,[37] but it is unclear whether this is Baltic amber or Lebanese amber. Baltic amber appears in southern Iberia in the 12th century BCE first at coastal sites, evidencing nautical trade.[38] Based on accumulating archaeological evidence from around the Mediterranean, Monroe[39] argues that the

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in cross-cultural Perspective. In *International Conference about the Ancient Roads in San Marino*.

32 Blažek, Václav. (2017). Indo-European "gold" in time and space. *Journal of Indo-European Studies*, 45(3/4), 267–311.

33 Vavra, Norbert. (2009). The chemistry of amber-facts, findings and opinions. *Annalen des Naturhistorischen Museums in Wien. Serie A für Mineralogie und Petrographie, Geologie und Paläontologie, Anthropologie und Prähistorie*, 445–473.

34 Todd, Joan Markley. (1985). Baltic amber in the ancient Near East: a preliminary investigation. *Journal of Baltic Studies*, 16(3), 292–301.

35 Mukherjee, A.J., Roßberger, E., James, M.A., Pfälzner, P., Higgitt, C.L., White, R., Peggie, D.A., Azar, D., Evershed, R. (2008). The Qatna lion: scientific confirmation of Baltic amber in late Bronze Age Syria. *Antiquity* 82, 49–59.

36 Homer's *Odyssey* 15.460.

37 Poltzer, Mark E, & Pineto Reyes, Juan. (2007). Phoenicians in the West. *The Institute of Nautical Archaeology at Texas A&M University*, 57.

38 Murillo-Barroso, M., Peñalver, E., Bueno, P., Barroso, R., de Balbín, R., & Martinon-Torres, M. (2018). Amber in prehistoric Iberia: New data and a review. *Plos One*, 13(8), e0202235.

39 Monroe, Christopher M. (2018). Marginalizing civilization: the Phoenician redefinition of

Phoenician expansion began in the 13th century BCE. The importance of this timeline cannot be understated. Thus it would appear that the emergence of the Phoenician trade ignited amber trade across the Mediterranean rim. The Hebrew innovation of תַּרְשִׁישׁ *taršīš* 'amber' would thus seem to coincide geographically and chronologically with the displacement of Lebanese amber in favor of Baltic amber in the Levant.

Baltic amber was exchanged among prehistoric European peoples from the Balkans towards southern European trading centers in Sicily, Italy, and Greece in what has been termed "the amber road". From these ports, Mycenaean (prior to the Bronze Age collapse) and later, Phoenician merchants would acquire Baltic amber, trading it along Mediterranean ports from Spain to Israel. To reach distant ports, the Phoenicians constructed massive ships for sailing through the Mediterranean and even into the Atlantic. The term for these ships has never been found in a Phoenician text, but does occur in the Hebrew Bible. 1 Kings 9–10 describes a joint Tyrian-Israelite voyage to אוֹפִיר 'Africa'[40] on an אֳנִי תַרְשִׁישׁ *ŏnī taršīš* (literally, 'a fleet of Tarshish').[41] It is clear from the Hebrew Bible that the Israelites were not experts in international sailing, as they required assistance from the Tyrians to construct and man the voyage.

Placing the construction אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš* into its ancient Levantine context, Beitzel[42] noted that the construction *ship* + [toponym] always "originally designated either the destination point or the provenance of the respective vessels". The biblical text does not describe the fleet going to or from Tartessos, rather to אוֹפִיר 'Africa'. He observed that the construction *ship* + [toponym] frequently developed in meaning beyond the original geographical destination or provenance in the name, citing no less than five cases of this semantic expansion.[43] The Phoenicians constructed large oceanic vessels for engaging in international Mediterranean commerce, exploring southern Iberia and eventually establishing a colony in Tartessos. Perhaps the first or most prominent destination was Tartessos—that information is now lost, but

power ca. 1300–800 BC. *Trade and civilisation: Economic networks and cultural ties, from prehistory to the early Modern Era*, 195–241.

40   Lipiński, Edward. (2004). Itineraria phoenicia (Vol. 127). Peeters Publishers. Chapter 6.

41   As will be made clear, the phrase אֳנִי תַרְשִׁישׁ *ŏnī taršīš* thus probably originated in Phoenician (which was fully mutually intelligible and hard to separate from Israelite Hebrew).

42   Beitzel, Barry J. (2010). Was there a joint nautical venture on the Mediterranean Sea by Tyrian Phoenicians and early Israelites?. *Bulletin of the American Schools of Oriental Research*, *360*(1), 37–66.

43   Ibid.

the term אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš* 'ship of Tartessos' appears to have shifted from the destination of the ship to the type of ship, namely an oceanic vessel. Thus, the Classical Hebrew term for an oceanic vessel is אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš*.

This must be understood from the perspective of the lexical corpus. Classical Hebrew uses יָם in construction to mean 'of the sea', yet it otherwise lacked a specialized adjective for 'oceanic, nautical, maritime'. Speakers must have reinterpreted תַּרְשִׁישׁ *taršīš* to fill that semantic hole, first by reanalyzing אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš* as "ship of Tartessos" → "oceanic vessel", and then by stripping out תַּרְשִׁישׁ *taršīš* as an adjective meaning 'oceanic, nautical, maritime'. There is a grammatical subtlety to the phrase אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš* unnoticed by previous authors. In order for אֳנִיָּה תַּרְשִׁישׁ *ŏniyyā taršīš* to shift from 'ship of Tartessos' (construct) to 'oceanic ship (adjectival)', תַּרְשִׁישׁ *taršīš* must have been reanalyzed as a feminine adjective to match אֳנִיָּה *ŏniyyā*, despite lacking any specific feminine marking. This is not a difficulty, it merely implies that תַּרְשִׁישׁ *taršīš* 'oceanic (ship)' is an irregular adjective. This semantic development is supported by the ancient Jewish Sages, who understood תַּרְשִׁישׁ *taršīš* to refer to the ocean in certain contexts. In numerous places in the Aramaic Targums, the Sages translate תַּרְשִׁישׁ *taršīš* as θάλασσα *thalassa* 'sea'. This interpretation goes back further. The Septuagint to Isaiah 2:16 translates *taršīš* as θαλάσσης *thalasses* 'of the sea (genitive)'. Jerome personally studied under Jews scholars in Palestine, and he comments that "Hebrew scholars maintain that *taršīš* is the Hebrew word for 'sea'".[44]

This scenario even suggests an etymology for *taršīš*-stone. Canaanite-speakers (such as the Phoenicians and Israelites) first encountered jewelry-grade amber from Phoenician merchants, who traded amber around the Mediterranean in their אֳנִיּוֹת תַּרְשִׁישׁ *ŏniyyōṯ taršīš* 'oceanic ships'. A syntactic quirk of Hebrew would enable speakers to apply the name of the ships from which amber was distributed to the stone itself. In Hebrew, a genitive phrase is only distinguishable from an adjectival phrase by context. It happens to be that the formation אֶבֶן *ʾeben* 'stone' + [specific name] is quite regular in Classical Hebrew, especially for gemstones. While speakers may have uttered the genitive phrase אֶבֶן תַּרְשִׁישׁ *ʾeben taršīš* with the intended meaning of "stone (from the) oceanic vessel", listeners unfamiliar with the maritime origin of amber may have reinterpreted the phrase to mean "*taršīš*-stone", where *taršīš* is the specific name of a type of stone. This was catalyzed by the fact that תַּרְשִׁישׁ *taršīš* 'oceanic (ship)' was already feminine (as I established in the previous

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44   Gordon, Cyrus H. (1978). The wine-dark sea. *Journal of Near Eastern Studies* 37.1, 51–52.

paragraph), which matched אֶבֶן *’eben* 'stone' (also irregularly feminine).[45]
Therefore, *taršīš* appears a product of further reanalysis whereby a type of ship
transformed into the name for amber.

4   Other Previous Views

Noting that ancient Jewish scholars identified one meaning of תַּרְשִׁישׁ *taršīš* as
'oceanic, nautical, maritime', Hoenig[46] went a step further by connecting תַּרְשִׁישׁ
taršīš with Greek θαλάσσης *thalasses* 'sea' etymologically. But the resemblance
is merely coincidental, the dissimilarity in the second syllable of these words—
between -*šīš* and -ασσα -*assa*—cannot be overcome. θαλάσσης *thalasses* is very
likely a "Pre-Greek" word literally meaning 'place of salt(water)'.[47] Taking the
translation of תַּרְשִׁישׁ *taršīš* as 'oceanic' to be correct, it would be intuitive to
assume that *taršīš*-stone resembles the ocean, implying a light-blue colored
stone. While this explanation may be intuitive, *taršīš*-stone is unambiguously
not blue in the Book of Daniel. But with the exception of the Septuagint and
its derivative translations, ancient Jewish translators translated *taršīš*-stone
with various species of blue stones. The Aramaic Targums translate *taršīš*-stone
as כרום ימא *krwm ym’* 'sea-colored' or ימא רבא כרום *krwm ym’ rb’* 'Mediterra-
nian Sea-colored', and likewise Symmachus as quoted in the Hexapla translates
taršīš-stone as ὑάκινθος 'purple jade'.[48]

   There is another Classical Hebrew noun that the meaning 'amber' has been
applied, albeit incorrectly: חַשְׁמַל *ḥašmal*. While the equation predates him,
Noonan maintains that חַשְׁמַל *ḥašmal* equals amber because he incorrectly
equates Hebrew חַשְׁמַל *ḥašmal* with Akkadian *elmēšu*, and finds false friends
for Akkadian *elmēšu* in Estonian *helmes* 'beads' (originally, 'amber') and Livo-
nian *el’maz*, *el’m*.[49] Akkadian *elmēšu* should actually be identified with חַלְמִישׁ
ḥallāmīš (as addressed in Chapter 18). To etymologize Estonian *helmes* and
Livonian *el’maz*, *el’m* from a substrate word which was loaned into Semitic
three millennia ago is too speculative a claim to make. The literature is divided
as to whether חַשְׁמַל *ḥašmal* referred to a stone or a metal, as the Septuagint

45   The textual data is ambiguous towards this point as no verse indicates the gender of *taršīš*-
      stone.
46   Hoenig, Sidney B. (1979). Tarshish. *The Jewish Quarterly Review*, 69(3), 181–182.
47   Gordeziani, Rismag. "Greek Words of Unknown Etymology Denoting Sea." *phasis* 12
      (2009): 160–163.
48   *The Identity of the Ὑάκινθος Hyacinthos Stone*, forthcoming.
49   Noonan, Benjamin. J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of lan-
      guage contact* (Vol. 14). Penn State Press. Pages 106–107.

translated חַשְׁמַל *ḥašmal* with ἤλεκτρον *elektron*, which referred to both the non-mineral gemstone *amber* and the alloy *electrum*. Typically in Classical Hebrew, lithonyms are preceded by the word אֶבֶן *ʾeḇen* 'stone'. That חַשְׁמַל *ḥašmal* is never preceded by אֶבֶן *ʾeḇen* 'stone' weighs in favor of the *metal*-hypothesis. Noonan rejected תַּרְשִׁישׁ *taršīš* as 'amber' specifically on the basis that he equates amber with חַשְׁמַל *ḥašmal*.[50] A hazard of philology is that a mistaken identification for one word may have multiple-order effects on the identification of others.

5   Conclusion

Based on the rich imagery in the Book of Daniel, תַּרְשִׁישׁ *taršīš* can only be identified with amber. The complicated semantic development of תַּרְשִׁישׁ *taršīš* in Classical Hebrew led to a complicated history of interpretation for *taršīš*-stone. The word perhaps originated as an ethnic group native to southern Iberia, which became the name of the country, and eventually the area itself. To reach this distant location, the Phoenicians constructed massive trading ships which they called אֳנִיּוֹת תַּרְשִׁישׁ *ʾŏniyyōṯ taršīš*. Sailing to southern European trading centers, they acquired Baltic amber which had been traded from peoples around the Baltic Sea. Canaanite speakers applied the word תַּרְשִׁישׁ *taršīš* to Baltic amber, which was traded out of the אֳנִיּוֹת תַּרְשִׁישׁ *ʾŏniyyōṯ taršīš*.

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50   Ibid, footnote 662.

שֹׁהַם *Šōham*—Onyx

Šōham is mentioned relatively frequently in the Hebrew Bible, appearing outside of the usual contexts of the *ḥōšen* and the garden of God in Ezekiel. It is the first stone mentioned in the Bible, where it is used to indicate geographical information about the location of the garden of Eden. As a result of this serendipitous reference, שֹׁהַם *šōham* may be the most discussed stone in Classical Hebrew. This fact also holds the key to its identity.

HALOT[1] and Klein[2] relate שֹׁהַם *šōham* to the Akkadian stone *sāmtu* 'carnelian'. However, a relationship between the two terms is problematic from a morphological perspective. Akkadian [ā] may be long, but glottal **h* should produce /ē/ as a reflex, for example PS **baʕl-um* 'owner, lord' → Akkadian *bēlu(m)*. Even if *sāmtu/sâmu* were a later borrowing into Akkadian at a time when *e*-coloring was no longer productive, we should not expect /ā/ to correspond to Hebrew **-uh-*. On the other hand, *sāmtu* cannot be a borrowing from Hebrew because it is almost certainly an Akkadian innovation from Sumerian. Akkadian *sāmtu* is etymologically transparent, it is the basic color term *sāmu* 'red' with the feminine suffix *-tu* attached. The basic color term *sāmu* is borrowed from the Sumerian word with the same meaning 'red'.[3] Sumerian had a totally different word for carnelian which was not loaned into any other Levantine language, NA4GUG. Thus, there is no possible scenario in which *šōham* may be etymologically related to *sāmtu*.

There is also a semantic difficulty with this connection. I have already established in Chapter 3 that carnelian is to be identified with אֹדֶם *ʾōḏem*, which is contrasted with שֹׁהַם *šōham* in the list of stones of the Priestly Breastplate. So carnelian cannot be a plausible identification for שֹׁהַם *šōham*. It really is difficult to assume אֹדֶם *ʾōḏem*—a perfect etymological parallel to *sāmtu/sâmu*—intends anything but carnelian, as addressed in the chapter on אֹדֶם *ʾōḏem*. One should be cautious ruling out an identification because it was already assigned to a different stone, as this has misled many previous lexicographers.

1   Holladay, W.L., Köhler, L., & Baumgartner, W. (1971). *A concise Hebrew and Aramaic lexicon of the Old Testament: based upon the lexical work of Ludwig Koehler and Walter Baumgartner.* Wm. B. Eerdmans Publishing.

2   Klein, Ernest, & Rabin, Ḥayyim. (1987). *A comprehensive etymological dictionary of the Hebrew language for readers of English.* Carta Jerusalem. Entry: שֹׁהַם.

3   Thavapalan, Shiyanthi. (2019). *The meaning of color in ancient Mesopotamia.* Brill. Page 141.

Harrell et al.[4] offered a more out-of-the-box solution to this problem by rei-dentifying *sāmtu* as amethyst. However, *sāmtu* is securely identified with car-nelian based on its usages in the Mesopotamian textual record. Considering the etymological and semantic difficulties with the equation of שֹהַם *šōham* with the Akkadian stone *sāmtu* 'carnelian', a different identification will be pro-posed.

1   The Location of חֲוִילָה *Ḥăwīlā*

The primary clue as to the identity of שֹהַם *šōham* is the famous reference in Genesis 2:12, which informs the reader that שֹהַם *šōham* is found in the enig-matic "land of חֲוִילָה *Ḥăwīlā*", where the "Pishon river" winds through.

וּזֲהַב הָאָרֶץ הַהִוא טוֹב שָׁם הַבְּדֹלַח וְאֶבֶן הַשֹּׁהַם:

> The gold (זָהָב) of that land is good; bdellium (בְּדֹלַח *bəḏōlaḥ*) is there, and *šōham* stone.

This is part of the geographical description of the location of Eden, which has been subject to extensive analysis and speculation over the millennia. For a discus-sion of some previous opinions on the location of the Garden of Eden and consequently the identification of the Pishon, see the first chapter of *Geogra-phy in the Parasha* by Elitzur, which is publicly available.[5] The contribution of a geological origin for שֹהַם *šōham* is a crucial piece of data in identifying exactly which stone שֹהַם *šōham* intended. The location of Eden is not agreed upon, but the philological method is sufficient to identify it. This piece of data may then be applied to שֹהַם *šōham* to determine its identity.

Ḥăwīlā is an ethno-toponym that appears to be situated in the Arabian peninsula, as Genesis 10:26–30 would seem to suggest. Here, *Ḥăwīlā* is de-scribed as one of the descendants of יָקְטָן *Yoḳtān*, along with a number of other Arabian groups such as חֲצַרְמָוֶת *Ḥăṣarmāweṯ*, שְׁבָא *Šěḇā*, and יֶרַח *Yeraḥ*. One must look toward Arabia for the identity. Arabian inscriptions have come to

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4 Harrell, James E., James K. Hoffmeier, and Kenton F. Williams. "Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis." *Bulletin for Biblical Research* 27.1 (2017): 1–52.

5 Elitzur, Yoel. (2021). *Places in the Parasha: Biblical Geography and Its Meaning*. Maggid. https://cdn.shopify.com/s/files/1/0229/0080/1614/files/Look_inside_Geography_in_the_Parasha.pdf?v=1602680108&16031.

light which name a North Arabian tribe called the *ḥwlt*,[6] a perfect cognate of *Ḥăwīlā*. Pliny mentions a group in Arabia called the *Aualitæ*,[7] which also appears to be cognate. This evidence is sufficient to narrow the search for *Ḥăwīlā* to the Arabian peninsula.

Dr. James A. Sauer argued that the Pishon River should be identified with the now dry Wadi Bisha, which cuts through central Saudi Arabia. Here it intersects with the Mahd adh Dhahab gold mine in modern Saudi Arabia, which was exploited in antiquity. Its gold found its way to Mesopotamia during the first millennium BCE in the form of tribute and probably trade.[8] Arabian gold had become a regular enough phenomenon in Mesopotamia at this time that there are several early Arabic loanwords in Akkadian pertaining to the semantic category of gold.[9] This would account for the gold mentioned in Genesis 2:12.

However, בְּדֹלַח *bəḏōlaḥ* presents a more difficult problem. Although the English word *bdellium* is used to translate בְּדֹלַח *bəḏōlaḥ*, it is not clear what exactly bdellium refers to. Noonan identifies בְּדֹלַח *bəḏōlaḥ* with the genus *Commiphora*, which contains several species whose resins are burned as incense. In Greek, βδέλλιον *bdellion* does not seem to refer to a specific species, rather, it seems to be used as a category for all resins from the *Commiphora*. This generic meaning cannot be ported back to Hebrew. Although the Hebrew Bible doesn't list this pairing, in a Phoenician inscription dated to the fifth-century BCE, *bdlḥ* is contrasted with *mr* 'myrrh' (the resin of *Commiphora myrrha*), which rules out this broad meaning. Some have identified Phoenician *bdlḥ* with *Commiphora wightii* (the source of mukul),[10] which is native to India, but there is no evidence for mukul in the ancient Levant! If a species of *Commiphora* must be chosen, *Commiphora kataf* is the most appropriate from a geographical perspective.

Alternatively, I would draw attention to the doum palm *Hyphaene thebaica*, whose Hebrew name (and the name for its aromatic resin) are currently unknown despite the broad range of this plant. In Arabic, the doum palm is

6   Macdonald, Michael C. (2000). Reflections on the linguistic map of pre-Islamic Arabia. *Arabian archaeology and epigraphy*, *11*(1), 28–79.

7   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 6, chapter 32.

8   Pickworth, Diana. (2021). Gold From Arabia For The Gods and Monarchs of Assyria. *South Arabian Long-Distance Trade in Antiquity: "Out of Arabia"*. Chapter 20, 463–485.

9   Kleber, Kristin. (2016). Arabian Gold in Babylonia. *Arabian Gold in Babylonia*, 121–134.

10   Dixon, Helen. (2021). The Smells of Eternity. *The Routledge Handbook of the Senses in the Ancient Near East*, 429.

allegedly referred to as "Jewish bdellium",[11] and probably referenced by Dioscorides as "the bdellium imported from Petra"[12] (see the discussion in *Meccan Spice Trade*[13]). This problem remains open. Regardless of the exact identity of Hebrew בְּדֹלַח *bəḏōlaḥ*, several Arabian aromatics are available that fit the description in Genesis. Thus the two other clues about the location of *Ḥăwīlā*—gold and bdellium—are perfectly consonant with the geology and botany of Arabia.

2 Terminological Issues concerning Onyx

Without any known cognates, an analysis must be predicated on the internal textual evidence provided by the biblical text and the identifications made by ancient authors. Antiquities of the Jews, the Vulgate, and the corrected text of the Septugaint and Jewish War translate שֹׁהַם *šōham* on the Priestly Breastplate as ὄνυξ *onyx* 'onyx'. Both the Greek term ὄνυξ *onyx* and the English term *onyx* are geologically ambiguous. The semantic ambiguity in English is preceded by a long history of confusion regarding the referent of ὄνυξ/*onyx* in Greek/Latin. Ὄνυξ *onyx* referred to both banded-chalcedony (SiO_2), travertine ($CaCO_3$), and perhaps certain forms of marble. For example, Pliny describes Egyptian travertine vessels as *onyx*.[14] The English term 'onyx' is semantically confusing because it is imprecisely applied to several species of dissimilar stones with parallel white and dark gray to black bands. It may refer to precious specimens of cryptocrystalline quartz (SiO_2) or a phenotype of marble ($CaCO_3$).

For the purpose of this analysis, onyx is defined strictly to refer exclusively to chalcedonies (cryptocrystalline quartz) that have white and dark gray to black bands running parallel to one another.[15] *Onyx* differs from *agate* in that agates may have curved bands and be of many different colors, though technically speaking onyx is a subset of agate. Onyxes occur naturally, but to achieve a striking black-and-white contrast, drably-colored agates are treated with various methods.[16]

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11   Feliks, Jehuda. (2007). Bdellium. *Encyclopaedia Judaica*, vol. 3 (2nd ed.), Thomson Gale, p. 234.

12   Dioscorides, *De Materia Medica*, 1:80.

13   Crone, Patricia. (2015). *Meccan trade and the rise of Islam*. Gorgias Press.

14   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 36, chapter 12.

15   Mindat.org, entry: onyx. www.mindat.org/min-2999.html. Retrieved on March 9, 2023.

16   Babintseva, E.B. (2014). *Comparison Of Different Ways Of Agate Coloring*. Siberian Federal University.

Scholars assume that ὄνυξ *onyx*, when used to translate שֹׁהַם *šōham*, referred to banded chalcedony, excluding the possibility that the ὄνυξ/onyx referred to in the Septuagint/Vulgate may have been one of the other species of ὄνυξ *onyx*. Although this assumption is never stated outright, it is probably correct. Travertine and marble were ornamental stones, not gemstones. Israel lacks true marble,[17] including the subvariety referred to as ὄνυξ/onyx by the Greeks and Romans. Shadmon advocated for a more expansive definition of marble to include any limestone hard enough to take a polish,[18] this definition has been rejected by geologists at large and thus here. The limestones usually (mis)translated as *marble* should be identified with שַׁיִשׁ *šayiš*, which is appropriate as a building stone, not a precious stone (see Chapter 19 שֵׁשׁ/שַׁיִשׁ—*šayiš/šēš* for greater detail).

3   Chalcedony Onyx in Arabia

Several Greco-Roman sources mention an onyx from Arabia. However, Dr. Lisbet Thoresen, an archeogemologist, argues that the "Arabian onyx" mentioned in Roman sources was a myth perpetuated by Arabian traders to preserve the true source of onyx in India:

> Few native gems are found in Arabia, least of all high-quality microcrystalline quartzes suitable for taking colour-enhancing treatments … Virtually all of the so-called 'Arabian' gems, especially those associated with the Arabian peninsula and the sea trade will have originated in India and were acquired from Indian traders, who in turn, negotiated with their own groups of intermediaries … The so-called 'Arabian onyx', which was touted as the high-quality material lapidaries prized for cameo carving, was blatant misinformation.[19]

This argument hinges on the factuality of the contention that "few native gems are found in Arabia, least of all high-quality microcrystalline quartzes suitable

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17   Burrell, Barbara. (2018). Multiple Reuse of Imported Marble Pedestals at Caesarea Maritima in Israel. In *ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA* (pp. 117–122). University of Split, Arts Academy in Split.

18   Shadmon, Asher. (1965). *Marble in Israel*. Ministry of Development, State of Israel.

19   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

for taking colour-enhancing treatments". Because the scope of her investigation is limited to Greco-Roman mentions and archeological attestations of gems, it may be fruitful to investigate earlier occurrences of onyx in the archeological record and ancient texts. Regarding a mention in the Hebrew Bible, the scope of our investigation must be concentrated at an earlier period than that of Pliny or Theophrastus. And indeed, in a pre-Hellenistic archeological and textual milieu, her statement does not hold water. Archeological evidence supplemented by local geological information increases the viability with identifying שֹׁהַם *šōham* with onyx.

A collection of 31 gold-wrapped onyx stones are held at the Brooklyn Museum, dating to the fifth-century BCE (the museum claims a more specific date, circa 410 BCE). They originated from Tell el-Maskhuta in northeast Egypt. Inscribed silver vessels accompanying these stones makes it clear that they belonged to second-generation immigrants from north Arabia.[20] They are described in the records both as 'agate' and 'onyx', though the difference is semantic (onyx is a type of agate). Modern high-quality color photographs taken by the Brooklyn Museum leave no room for doubt that these stone are onyxes.[21] The details of this find match what might be expected of Havilites based on the description of the natural resources of *Ḥăwīlā* in Genesis, though this find is dated far too late to fit the text. But that north Arabians passed onyx stones mounted in gold as an heirloom to their children is a significant starting point in this investigation.

On the foundation inscription of the *bīt akīti* in Aššur (dated to 683 BCE), Sennacherib reports an audience-gift of *pappardilû*-stone, other non-specific precious stones and aromatic resins (perhaps bdellium) from the Sabean king Karib'il Watar. Six onyx beads discovered at Nineveh have inscriptions on them which claim that they are the audience-gift to Sennacherib that Karibili king of Saba, "brought me".[22] The alignment between the *bīt akīti* inscription and the inscribed onyxes is quite a serendipitous find. This not only provides direct evidence of Arabian sourcing of onyx, but also provides the Akkadian term for onyx, *pappardilû* (from Sumerian BABBAR.DILI).

Previous scholars have been somewhat misled by *pappardilû*. Laboratory analysis of an inscribed bead that indicated that it was ᴺᴬ⁴BABBAR.DILI re-

20   Rabinowitz, Isaac. (1956). Aramaic inscriptions of the fifth century BCE from a north-Arab shrine in Egypt. *Journal of Near Eastern Studies*, *15*(1), 1–9.

21   www.brooklynmuseum.org/opencollection/search?keyword=410. Retrieved 9 March 2023.

22   Potts, Daniel T. (2003). The *mukarrib* and His Beads: Karib'il Watar's Assyrian Diplomacy in the Early 7th Century B.C. *Isimu VI*. 179–206.

vealed its composition to be cryptocrystalline quartz treated to appear like "banded agate".[23] Though this description is gemologically vague, it matches onyx. Etymologically, Akkadian *pappardilû* and the related term *papparminnu* are both clear descriptions of onyx. Both are borrowings from Sumerian, borrowed from Sumerian ᴺᴬ⁴ʙᴀʙʙᴀʀ.ᴅɪʟɪ "one white (band)" and ᴺᴬ⁴ʙᴀʙʙᴀʀ.ᴍɪɴ₍₅₎ "two white (bands)" respectively.[24] This appears to be a description of black agates which are distinctively marked by white bands, which gemologists would term *onyx* (contra Schuster-Brandis,[25] who generically defines *pappardilû* as 'banded agate').

The entry for *pappardilû* in the *Chicago Assyrian Dictionary* lists a number of texts that describe *pappardilû* mounted in gold, which matches the Brooklyn Museum stones. This simultaneously draws back the chronology by which this stone is attested, as the word *pappardilû* is found in texts dating to the Old Assyrian and Old Babylonian period (Middle Bronze age, 1950–1530 BCE) and forward. As a loanword from Sumerian, the word may date even earlier. However, it is difficult to determine if all instances of *pappardilû* designate onyx, as opposed to a phenotypically similar stone. The ancients classified stones by appearance, hardness, and origin, not by chemical composition. Furthermore, even if the Mesopotamians were importing onyx from Arabia, it would be difficult to determine this for sure without an explicit textual reference to the affirmative. The common description of *pappardilû* mounted in gold may be the best evidence of *pappardilû* imported from Arabia, because it fits the style associated with that area archaeologically.

It can be said that stamp seals carved from various forms of agate are abundant in the archeological record of ancient Yemen, in the corpus analyzed by Diana Pickworth stretching from the 4th millennium BCE to the middle of the 1st millennium CE.[26] She notes that these types of agates are found locally in the Jebel Balaq area near Ma'rib. Provenancially, agates occur in igneous and metamorphic rocks, but not in sedimentary rock. Because Gebel Balaq is composed entirely of limestone, agates do not occur in the mountain proper.[27] Looking

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23   Beaulieu, Paul-Alain. (1998). Ba'u-asītu and Kaššaya, Daughters of Nebuchadnezzar II. *Orientalia, 67*(2), 173–201.

24   Kogan, Leonid & Krebernik, Manfred. (2020). *Etymological Dictionary of Akkadian. Volume 1 Roots beginning with p and b*. Berlin, Boston: De Gruyter. 392–394.

25   Schuster-Brandis, Anais. (2008). *Steine als Schutz-und Heilmittel: Untersuchung zu ihrer Verwendung in der Beschwörungskunst Mesopotamiens im 1. Jt. v. Chr* (Vol. 46). Ugarit-Verlag. 403.

26   Pickworth Wong, Diana. (1999). *Stamp Seals of the Ancient Yemen* (Doctoral dissertation, PhD thesis, Berkeley, University of California. [Unpublished]). 169.

27   Harrell, personal correspondence.

towards the nearby area, we do find volcanic (igneous) rock capable of containing agates.

In their review of the geology of Yemen, El Shatoury and Al Eryani mention that "[t]he famous agate of Yemen comes from several areas covered by the Tertiary Trap Volcanics around Sana'a and else [*sic*]".[28] She is referring to the aqeeq (Arabic: عقيق *ʕaqīq*) producing region, which even today produces banded chalcedonies, which are cut, polished, and exported throughout the Islamic world. English literature on the topic of aqeeq is still lacking, perhaps due to its geographical isolation and irrelevance to western markets. It may be added that Jebel al-Ma'taradh in the UAE was also exploited for its chalcedonies in deep antiquity, but the blades and beads produced were probably restricted to the general area.[29]

Although the text does not state this explicitly, the collective 'precious stone' (אֶבֶן יְקָרָה) brought by the Queen of Sheba to King Solomon[30] should probably be identified with these cryptocrystalline quartzes, including onyx, agate, and colored chalcedonies. This is because Sheba (שְׁבָא) should be identified with the ancient Yemeni kingdom of Saba'.[31] The availability and usages of banded cryptocrystalline quartz for onyx was broad on the Arabian peninsula, and Thoresen's claim should not be sustained. Considering the plausibility that שֹׁהַם *šōham* refers to onyx, there is no reason to reject this identification.

4 The Egyptian Word for Onyx

No Ancient Egyptian term has been positively associated with onyx, although onyx was occasionally found in Egypt as an import. Ancient Egyptian *kꜣ* is usually identified with 'agate', although this identification is not secure. Onyxes are technically a specific kind of agate, with distinct black-and-white bands, which may be enhanced by treatment. Perhaps *kꜣ* specifically refers to the black-and-white banded onyx, not just any banded agate. Exact colors of *kꜣ* are attested, *kꜣ ḥḏ* (white *kꜣ*) and *kꜣy km* (black *kꜣ*). This is certainly an odd way to describe

28   El Shatoury, Hamed M, and Al Eryani, Mohammad L. (1977). Review on Mineral Occurrences in Yemen Arab Republic. *Mining Geology*, 27(144), 277–288.

29   Charpentier, Vincent, Brunet, O., Méry, S., & Velde, C. (2017). Carnelian, agate, and other types of chalcedony: the prehistory of Jebel al-Ma'taradh and its semi-precious stones, Emirate of Ra's al-Khaimah. *Arabian Archaeology and Epigraphy*, 28(2), 175–189.

30   1 Kings 10:2.

31   Simpson, St. John. (2002). *Queen of Sheba: treasures from ancient Yemen*. British Museum Press.

banded agate or any other gemstone known to the Egyptians, but would suit onyx if we might be a bit creative in interpreting these terms as 'majority-white onyx' and 'majority-black onyx'. In Ancient Egyptian, *k₃* normally refers to a bull. Cross-linguistically, the cattle eyes are used to describe onyxes. For instance, Aramaic uses the term עגלא עין *ʕyn ʕglaʾ* 'calf's eye', Middle Persian **go-čašm* 'ox eye' to describe onyx cabochons.[32] Thus, Ancient Egyptian *k₃* may refer to onyx *instead of* or *in addition to* agate.

5   Towards an Etymology

Previous researchers have not proposed any viable etymologies for שֹׁהַם *šōham* so far as I have been able to ascertain. It is not easy to identify the etymology of שֹׁהַם *šōham*. As far as I am aware, the Old South Arabian word for onyx (and as the archeological evidence shows, one can be fairly certain that they had a word for onyx) is unknown as of yet, and no word of the form ****s₁hm* or ****ṯhm* has been found that may be plausibly linked to שֹׁהַם *šōham*. The Arabic word for onyx, جَزْع *jazʕ*, is an innovation from the root ج-ز-ع *j-z-ʕ* 'to cross, cut, afflict' in reference to the black-and-white banding of onyx, and is evidently unrelated to שֹׁהַם *šōham*.

Because the Bible links שֹׁהַם *šōham* with *Ḥăwīlā*, it is reasonable to assume that the word originates in that language. It is not even obvious that שֹׁהַם *šōham* is a borrowing from OSA, because the "Havilite" language has not yet been identified. Whether the *Ḥwlt* spoke some variant of OSA, proto-Arabic, or another Semitic language completely is a matter of speculation. Hopefully, future archeological and linguistic discoveries will shed more light on this matter. Based on the suspected language of origin (OSA) and role as an object of tribute, a tentative etymology might be proposed.

One of the few solid Arabian words loaned into Classical Hebrew is the term for the sycamore tree (*Ficus sycomorus*), שִׁקְמָה *šiḵmā*. Steiner suggested that שִׁקְמָה *šiḵmā* is a borrowing from a form like *s₁qmtm*, which he analyzed as an *š*-causative noun from the OSA root *qwm* 'stand, be planted' meaning something like 'planted one'. The form *s₁qmtm* (pronounced something like **šuqamatum*) 'sycamore' is attested in OSA, and archaeobotanical research has established that the tree originated from that region. OSA is able to form nouns through a nominalized *š*-causative stem (unlike the other OSA dialects, Sabaic forms

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32   Hyllested, Adam. (2017). *Armenian gočazm 'blue gemstone' and the Iranian evil eye*. Usque Ad Radices. Indo-European Studies in Honour of Birgit Anette Olsen.

causatives with *h*-). Another example of an *š*-causative noun in OSA is the Hadhramautic town of Sumhuram *s₁mhrm*.

The same *š*-causative nominal stem may also be behind שֹׁהַם *šōham*. That the stone was given as tribute by the ancient Arabians suggests a root like *w-h-b* 'to give', and when formed into an *š*-causative noun,[33] would produce a form like **šuwahbu(m)* meaning something like '*the thing forced to be given*' = *tribute*. The semantic change *tribute → object given as tribute* finds a nice parallel in Hebrew אַרְגָּמָן 'purple dye, purple fabric', a direct borrowing from Hittite *arkaman-* 'tribute (plural)' → 'purple-dyed cloth'.

Evolution from a form such as **šuwahbu(m)* may be established via the following sound changes. Mimation nixed the final **-m*, shown here in parentheses. Likewise, the case marker (**-u*). Under influence of the preceding labial sequence **/uw/*, speakers may have dissimilated **b* to /m/, a common occurrence in Hebrew when labial consonants co-occur in the same word. Suchard[34] proposed that medial-*w* triphthongs simplified in pre-Hebrew according to the rule **v̆₁Wv₂ > *v̄₂*, and it is an established rule that long vowels in historically closed syllables reduce. In our example, the triphthong **-uwa-* simplified to **ā* before reduction to **a*. While the structure of *šōham* suggests the proto-form **suhm-*, spontaneous change may account for the discrepancy in light of the fact that *qvtl* nouns tend towards the instability of their vowel.[35] This may be explained by metathesis of the vowels in the triphthong **-uwa-* to **-awu-*. Alternatively, Steiner's reconstruction of the stem may be at issue, and a form like **šuwuhbu(m)* may be a better reconstruction. Like other 2C-guttural *u*-segolate nouns,[36] it was infixed with an *-a-* to break up the final cluster composed of the second and third consonants.

By analogy to שִׁקְמָה *šiḵmā*, שֹׁהַם *šōham* is perfectly explicable as a borrowing from an ancient Arabian language like Sabaic. But without an attestation in an Old South Arabian language, it is proper to be cautious regarding this etymology. On account of the shared geographical origin with בְּדֹלַח *bəḏōlaḥ*, which is widely assumed to be a borrowing from another language family, perhaps שֹׁהַם *šōham* is not Semitic at all.

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33 On this basis, origin in the Sabaic dialect is not viable. Unlike the other OSA dialects, OSA forms causatives with *h*-.

34 Suchard, Benjamin. (2019). *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill. Chapter 5.

35 Fox, Joshua. (2003). *Semitic noun patterns*. Brill. 108.

36 Other examples include סֹהַר, זֹהַר, et al.

6   New Biblical Interpretations

1 Chronicles 29:2 lists various precious materials that David left to be used in the building of the first temple, one of which is שֹׁהַם *šōham*.

> וּכְכָל־כֹּחִי הֲכִינוֹתִי לְבֵית־אֱלֹהַי הַזָּהָב לַזָּהָב וְהַכֶּסֶף לַכֶּסֶף וְהַנְּחֹשֶׁת לַנְּחֹשֶׁת הַבַּרְזֶל לַבַּרְזֶל
> וְהָעֵצִים לָעֵצִים אַבְנֵי־שֹׁהַם וּמִלּוּאִים אַבְנֵי־פוּךְ וְרִקְמָה וְכֹל אֶבֶן יְקָרָה וְאַבְנֵי־שַׁיִשׁ לָרֹב

> I have spared no effort to lay up for the House of my God gold for golden objects, silver for silver, copper for copper, iron for iron, wood for wooden, stones of *šōham* and inlay, stones of malachite and variegated colors— every kind of precious stone and much limestone.

Considering that the Queen of Sheba visited Solomon shortly thereafter, and onyx originated from the same area, this detail adds additional resolution to the international gemstone trade in antiquity. Arabian onyx found its way to Israel circa 10th century BCE.

Other translations of שֹׁהַם *šōham* made in antiquity may be meaningfully understood when placed in their cultural-historic context. There were two additional *šōham*-stones placed on the shoulder of the High Priest, which were translated by the Septuagint is σμάραγδος *smaragdos*. This is only baffling if one forgets the audience that the Septuagint was written for. In the Greek world, *smaragdoi* were used as cultic objects (see Chapter 5), and so σμάραγδος *smaragdos* better conveyed the purpose of the *šōham*-stones, which was to signify the divine presence. Josephus frequently adapts his description of the priestly garments to his Roman audience,[37] and the Talmud describes instances in the Septuagint where the text was intentionally altered for its Greek-speaking target demographic.[38]

Despite the claims of some academics, the traditional identification with onyx is not only possible but plausible when placed into the historical circumstances of ancient Israel. The ancient Arabians were mining attractive banded chalcedonies and working them into various forms including seals and pendants. Gold-framed onyxes were exported out of the peninsula in the form of tribute and likely through mercantile trade as well. Given this information, onyx was probably viewed as the archetypical Arabian gemstone in antiquity

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37   Pena, Joabson Xavier. (2021). Wearing the Cosmos: The High Priestly Attire in Josephus' Judean Antiquities. *Journal for the Study of Judaism*, *52*(3), 359–387.

38   Jerusalem Talmud, Tractate Megillah 1:9. Babylonian Talmud, Tractate Megillah 9a.

and the reference to שֹׁהַם šōham in Genesis would seem to clinch the identification. Though שֹׁהַם šōham is translated as ὄνυξ onyx in the Septuagint, there is certainly no reason to assume that שֹׁהַם šōham intended both chalcedony onyx and onyx marble as does ὄνυξ onyx. As far as can be ascertained from the limited information provided in the Hebrew Bible, שֹׁהַם šōham was restricted to the onyx that was imported together with its name from Arabia.

While the etymology of שֹׁהַם šōham still eludes scholars, the geographical information provided at the beginning of Genesis makes it quite likely that שֹׁהַם šōham was some sort of chalcedony. Textual evidence from Mesopotamia and archaeological evidence from Egypt indicate onyx was the quintessential mineral import from Arabia, an identification supported by the Septuagint's translation of שֹׁהַם šōham with Greek ὄνυξ onyx 'onyx'. Given the geographical and contextual associations, a speculative donor Old South Arabian *šuwahbu(m) has been reconstructed, an š-causative noun from the root w-h-b 'to give'. It would not be surprising to find a word of this shape in an OSA inscription, lithonyms are inexplicably common in OSA inscriptions.[39]

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39   Agostini, Alessio. (2010). Building materials in South Arabian inscriptions: observations on some problems concerning the study of architectural lexicography. In *Proceedings of the Seminar for Arabian Studies* (pp. 85–97). Archaeopress.

יָשְׁפֵה *Yošpē*—Blue Chalcedony

The twelfth and final stone on the Priestly Breastplate is ישפה, its vocalization differing between the manuscripts. Whereas the Leningrad manuscript of the Masoretic text (used as the standard) renders the word with a final syllable -*pē* ⟨יָשְׁפֵה⟩, this orthography is highly unusual. The matres lectionis ⟨ה-⟩ usually indicates a final vowel such as /-e/ or /-ā/ (also the sequence /-āh/). In fact, multiple other manuscripts do render /-e/ for ישפה,[1] so the reading ⟨יָשְׁפֶה⟩ should be strongly preferred. The rendering in the Leningrad codex as ⟨יָשְׁפֵה⟩ instead of ⟨יָשְׁפֶה⟩ may be a simple orthographic error, as *səḡôl* /e/ and *ṣērê* /ē/ differ orthographically by a single dot. The alternative possibility is that the rendering with *ṣērê* may reflect an archaism. In Tiberian Hebrew, final **-ē* shifted to *-e* in the nominative, which is why /e/ is the only short vowel found in a word-final position. But why the older pronunciation should be preserved in this particular word is inexplicable.

A short final /-e/ would also explain the unusual final vowel present in cognates. Proto-Semitic **-ayu* is reflected as *-e* in Hebrew[2] and *-û* in Akkadian cuneiform (compare Hebrew שָׂדֶה *śāḏe* 'field' and Akkadian *šadûm* 'mountain, open country', from PS **ɬadayum*[3]), so the underlying form of יָשְׁפֵה *yošpē* can be reconstructed with the sequence **-ayu*. There is therefore no need to resort to Hurrian thematic vowels to explain the peculiar final element, as Noonan suggested.[4] The first vowel in the word is **/a/*, though יָשְׁפֵה *yošpē* only occurs in the pausal form, with a kamatz. Thus I render the nominative as יַשְׁפֵה *yošpē*. It is far more problematic that the *pē* in יָשְׁפֵה *yošpē* is spirantized despite immediately following another consonant. Normally, this indicates the presence of a short vowel that was lost. However, cognates show a consonant-consonant syllable boundary, which is incompatible with reconstructing a short vowel between the *shīn* and the *pē*.

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1 Eißfeldt, Otto, Fichtner, J., Gerleman, G., Hempel, J., Horst, F., Jepsen, A., & Thomas, D.W. (1977). *Biblia Hebraica Stuttgartensia*. Deutsche Bibelgesellschaft. *Exodus*, page 133.

2 Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019. 139.

3 Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019. 237–238.

4 Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press.

1 Cognates

On the basis of an obvious phonetic similarity, Hebrew יָשְׁפֵה *yošpe* has often been identified as jasper, usually of the green varietal. This has an etymological basis—English *jasper* comes from Old French *jaspre*, from Latin *iaspis*, from Greek ἴασπις *iaspis*, which looks quite phonetically similar to יָשְׁפֵה *yošpe*. But *jasper* diverges semantically from its Greek etymon ἴασπις *iaspis* because stones are now categorized on the basis of chemical, structural, and qualities otherwise only knowable through modern science. The scientification of geology accelerated the semantic evolution of *jasper*, even beyond that normally to be expected from two millennia of language change. Jasper[5] is "a poorly defined lapidary name for a red (due to hematite inclusions) to variably coloured chalcedony". But ἴασπις *iaspis* (and presumably יָשְׁפֵה *yošpe*) was probably defined on the basis of easily percieved properties like origin, color, hardness, utility, and so on.

As far as meaning is concerned, יָשְׁפֵה *yošpe* is part a semantically diverse family of words. Hebrew יָשְׁפֵה *yošpe* has many ancient cognates beyond Latin *iaspis* and Greek ἴασπις *iaspis*. These include Hittite *yašpu-*, Greek ἴασπις *iaspis*, ἴασπιδ- *iaspid-*, Akkadian *ašpu*, Amarna Akkadian *yašpu*, Elamite *ia-áš-pu*, and New Persian يَشم *yašm*, يَشپ *yašp* 'jade'[6] (whence → Arabic يَشم *yašm*, يَشب *yašb*). On the basis of these cognates, we may reconstruct an ancestral form of a shape approximating **yaspay-* (note that Hebrew and Akkadian [š] were historically pronounced /s/). Noonan posits that this family of words derives from a Hurrian donor **iaspe* on the basis of several associations:

– King Tušratta of Mittani gifts Pharaoh Amenphis III with this stone.
– Sargon II refers to the city of Zimur in Urartu as "ᴷᵁᴿZimur šadī ᴺᴬ⁴ašpê" ('*ašpê*-stone mountain').
– The base-stem of Greek ἴασπις *iaspis* is ἴασπιδ- *iaspid-*, which he takes as indicative of an Anatolian origin.

These points alone are insufficient to conclude a Hurrian origin. Hurrian **iaspe* is totally unattested, and it is just as possible that **iaspe* was loaned from another language, if it existed at all. Because the reconstructed proto-form **yaspay-* has four consonantal radicals, it is reasonable to posit a borrowing into Semitic. Given that **yaspay-* is neither Egyptian nor Mesopotamian, it may be Anatolian, but could also be from elsewhere. Instead of starting with an etymology, it may be more fruitful to work from an identification, and work

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5   Mindat.org, entry: jasper. www.mindat.org/min-2082.html. Retrieved 9 March 2023.
6   Melikian-Chirvani, Assadullah Souren. (1997). Precious and Semi-Precious Stones in Iranian Culture Chapter I. Early Iranian Jade. *Bulletin of the Asia Institute*, *11*, 123–173.

backwards from geological origin to the language of origin. Let us start with the most ancient attested cognates.

2   Yaspids in Greek and Mesopotamian Sources

Pliny explains that the semantic range of Greek ἴασπις *iaspis* was broad enough to encompass many opaque blue-green stones. Likewise, the English term *jasper* has undergone extensive semantic change from the blue-green ἴασπις *iaspis*. This polysemy necessitates looking at the meanings of the oldest cognates to determine the oldest identifiable meaning(s) for this word. Because descriptions of Greek ἴασπις *iaspis* and various Mesopotamian cognates have been preserved in abundance, we shall start there.

In Pliny's *Natural History*, ἴασπις *iaspis* is a generic term that encompasses fourteen species of precious stone.[7] It is difficult to determine exactly which varieties of precious stones were encompassed under ἴασπις *iaspis*, much less what the archetypical ἴασπις *iaspis* was. Iaspids may be green, blue, pink or purple, so color does not appear to be the defining quality of ἴασπις *iaspis*. Theophrastus is the earliest source on ἴασπις *iaspis*, and he mentions a "half-smaragdos, half-iaspis".[8] Some quality must have differentiated ἴασπις *iaspis* from σμάραγδος *smaragdos*, but what the differentiating quality might have been is hard to say.

Like with Greek ἴασπις *iaspis*, Akkadian and Sumerian cognates refer to a series of different blue-green stones. The Akkadian textual corpus is attested across a large geographical area over thousands of years, and therefore many variations exists within Akkadian vocabulary. The primary Akkadian reflex of this word has two forms, the standard form *ašpû* and a more original-looking form *yašpû*, attested only within Amarna Akkadian. I caution that despite appearing more conservative, Amarna Akkadian *yašpu* is probably reborrowed from Proto-Canaanite **yašpay* (ancestral to יָשְׁפֵה *yošp̄e*). Collected here is a list of some of these Sumerian and Akkadian forms, their equations, and descriptions:

a.   Sumerian $^{\text{NA4}}$amaš.mú.a = Akkadian *abašmû*

b.   Sumerian $^{\text{NA4}}$amaš.pa.e$_3$ = Akkadian *ašpû*[9]

7   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 37.

8   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. 51.

9   Postgate, Nicholas. "Mesopotamian petrology: Stages in the classification of the material world." *Cambridge Archaeological Journal* 7.2 (1997): 205–224. 215.

c.   Sumerian ᴺᴬ⁴amaš.pa.e₃ = Akkadian *abašmû*[10]
d.   Akkadian *abašmû* = "unripe grape", "water of a canal"
e.   Akkadian *amašpu* = "sunset"
f.   Akkadian *ašpû* = "clear sky", "raincloud"[11]

The descriptions of *abašmû*, *amašpu*, and *ašpû* in Šilhak-Inšušinak are particularly enlightening. Describing *abašmû* as an "unripe grape" and the "water of a canal" makes it clear that this species is green, perhaps referring to jade. But *amašpu* is a different story. While *amašpu* looks like a metastasized version of *abašmû*, a description as the color of "sunset" is too general to be deciphered. Akkadian *ašpû* is described as both a "clear sky" and a "raincloud". These descriptions are not identical—a "clear sky" is light-blue whereas a "raincloud" is gray.

The diversity of reflexes in Sumerian and Akkadian most certainly reflects a multiple-borrowing scenario, each form designating a slightly different species of gemstone. Whereas Pliny applied one term with modifiers to a number of different precious stones, Akkadian and Sumerian seem to have reborrowed the term from multiple sources to apply to slightly different stones. By implication, it may be asked whether Hebrew יָשְׁפֵה *yošpe* refers to a category of precious stones as does the Greek term, or one particular type of gemstone as in the Mesopotamian examples. If one particular type of gemstone is being referred to by יָשְׁפֵה *yošpe*, determining which stone was present on the Priestly Breastplate is of utmost significance.

The diversity of geological identities encompassed within the Greek term ἴασπις *iaspis* and various Akkadian yaspids obscures rather than clarifies the meaning of Hebrew יָשְׁפֵה *yošpe*. But in both systems, there does appear to have been an original/archtypical species designated by ἴασπις/*ašpû*, the terms becoming conceptually altered as similar stones were encountered. It is not necessary to assume the same process occurred in Ancient Israel, where the limited geographic scope of its territory restricted the diversity of gemstones encountered. Regarding the linguistic strategies used to manage these problems, polysemy with modifier (Greek) and reborrowings (Akkadian) are virtually unknown in Classical Hebrew. As a tendency, Hebrew much preferred to neologize or borrow a dissimilar term. Prima facie, there is no reason יָשְׁפֵה *yošpe* must have referred to more than one species of gemstone.

This places the problem at an impasse: it is uncertain if יָשְׁפֵה *yošpe* referred to one or many species of gemstones, or which one(s) it was. The rediscovery of the original/archtypical species shall resolve it.

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10   Ibid, 216.
11   Ibid, 217.

3   The Elamite *Yašpu*

It is a rare find indeed that a precious stone should be inscribed with its own
name. We are fortunate to possess a bead of Elamite with just such an inscrip-
tion. In *A New Inscription of Šilhak-Inšušinak*,[12] Edward Sollberger describes a
bead made from "pale-blue chalcedony" engraved in Elamite that describes the
composition of the bead as "*ia-áš-pu*". This Elamite word *yašpu* is obviously
a cognate of Hebrew יָשְׁפֵה *yošp̄e* and Greek ἴασπις *iaspis*. This specific iden-
tification matches the description of Akkadian *ašpû* in *Abnu šikinšu*, which
describes *ašpû* as having the appearance of "a clear sky" and "a raincloud".

(76)   The stone whose nature is like a clear sky: its name is *ašpû*.
(77)   The stone whose nature is like a rain-cloud: its name is *ašpû*.[13]

The actual color of "blue chalcedony" is pale blue-gray, to which "a clear sky"
and "a raincloud" are valid comparisons. This suggests that Akkadian *ašpû* (and
its Amarna Akkadian equivalent *yašpu*, closely related to יָשְׁפֵה *yošp̄e*) was likely
restricted to the blue chalcedony mentioned by Sollberger. Blue chalcedony is
described in several of the ancient Greek sources as a variety of *iaspis*. The third
variety of *iaspis* mentioned by Pliny[14] clearly describes blue chalcedony:

> Persae aëri simile, quae ob id vocatur aërizusa
> Persian (*iaspis*) is sky-blue, and therefore is called *aërizusa*.

The other varieties of *iaspis* described by Pliny do not fit this description.
Epiphanius of Salamis preserves abundant information about precious stones
in the ancient world, although *De Gemmis*, his composition on stones, is only
extant in translations into Georgian, Armenian, and in Coptic fragments. While
this work does not appear to be rooted in an authentic tradition regarding the
identities of Hebrew gemstones, it does contain bits of ancient gemological
information no longer extant in more reliable sources. Epiphanius lists seven
species of *iaspis*, which is not unusual for descriptions of *iaspis* in Common
Era writings. Notably, Epiphanius mentions that his seventh and final species
of iaspis is the original species.

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12   Sollberger, Edmond. (1965). A New Inscription of Šilhak-Inšušinak. *Journal of Cuneiform
     Studies*, *19*(1), 31–32.
13   Postgate, Nicholas. (1997). Mesopotamian petrology: Stages in the classification of the
     material world. *Cambridge Archaeological Journal*, *7*(2), 205–224.
14   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at
     Tufts*. Book 37, chapter 37.

there is an iaspis, the so-called ancient, which is like snow or sea foam.

This comports with the Elamite evidence, and points further towards blue chalcedony as the archetypical yaspid. In sum, blue chalcedony appears to be the gemstone most commonly considered a yaspid. In private correspondence, Thoresen suggested to me that this smaragdos-iaspis may be a blue chalcedony (the ἴασπις *iaspis*) with a green cuprous mineral (the σμάραγδος *smaragdos*) growing on it. If so, ἴασπις *iaspis* may originally have intended blue chalcedony. Akkadian *ašpû*, perhaps the oldest form of this word in Akkadian, was described in Šilhak-Inšušinak as (the color of a) "clear sky" or a "rain-cloud". And most importantly, there was Sollberger's blue chalcedony bead which describes itself as composed of "*ia-áš-pu*". However, none of these are absolutely definitive for the identity of Classical Hebrew יָשְׁפֵה *yošpe*.

4   Breaking My Rules

The last row of stones of the Priestly Breastplate has been metastasized between the Septuagint, Josephus' writings, and the Vulgate. In Josephus' *Antiquity of the Jews* and the Vulgate, the sequence is identical and is the most holistically reasonable given the identifications of תַּרְשִׁישׁ *taršîš* 'amber' and שֹׁהַם *šōham* 'onyx'. This order should be reconstructed for the original text of the Septuagint, with יָשְׁפֵה *yošpe* translated as βήρυλλος *beryllos*. The term βήρυλλος *beryllos* was used by Pliny[15] to refer to *aquamarine*:

> Beryls, it is thought, are of the same nature as the smaragdus, or at least closely analogous. India produces them, and they are rarely to be found elsewhere. The lapidaries cut all beryls of a hexagonal form; because the colour, which is deadened by a dull uniformity of surface, is heightened by the reflection resulting from the angles. If they are cut in any other way, these stones have no brilliancy whatever. The most esteemed beryls are those which in colour resemble the pure green of the sea …

Whereas *beryl* refers to a stone with the chemical formula $Be_3Al_2Si_6O_{18}$ independent of color, its etymon βήρυλλος *beryllos* referred exclusively to aquamarine. The Septuagint's translation has been rightly considered historically

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15   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 20.

problematic because aquamarine was unknown in Egypt prior to the Ptole-
maic period,[16] and subsequently would have been unknown to the Ancient
Israelites.

Aquamarine, especially the now unpopular opaque subvariety is a very
good approximation of blue chalcedony, light-blue color being restricted in
the ancient world to these gemstone species. There may be a good reason
that the translator of the Septuagint used the imprecise word βήρυλλος *beryl-
los* to translate יָשְׁפֵה *yošp̄e*. Greek ἴασπις *iaspis* occupied too broad semantic
range to specifically describe blue chalcedony. Pliny's *aërizusa* seems to be a
transliteration of Greek ἀερίζουσα, but this was probably not a very common
term—Pliny is the only author in the ancient corpus to use this word. When
looking for an appropriate Greek word to describe blue chalcedony, βήρυλλος
beryllos may have been the best available term to approximate the true range
of יָשְׁפֵה *yošp̄e*. Counterintuitively, this anachronistic translation confirms that
יָשְׁפֵה *yošp̄e* referred to blue chalcedony.

5   Cultural *Realia*, Geography, Mythology—Towards an Etymology

Up to this point, no etymology for יָשְׁפֵה *yošp̄e* and its many cognates has been
offered. In none of the languages discussed does this wandering word have
any evident etymology. The correct identity of יָשְׁפֵה *yošp̄e* has been established
without recourse to etymology (and the perils that accompanies it; namely, the
etymological fallacy). But there is a much deeper history to this word, only dis-
coverable by traveling far beyond the geographical and cultural world of the
Bible.

The consistent pattern is that precious stones tend to be traded, with their
names traded along with them. To find a given etymology, it is usually sensi-
ble to look at the languages spoken where a precious stone originated. In this
case, יָשְׁפֵה *yošp̄e* 'blue chalcedony' is only of slightly mysterious origins. Pliny's
Persian *iaspis*—which Epiphanus informs us was the archetypical *iaspis*—was
from Persia, the same geographical area as Elam. And precisely such light-blue
stones are known from sites in Iran, for example, the Khur agate field, in Khur-
e-Biabanak, Esfahan province.[17] Despite its long history of exploitation, there is
a dearth of literature on Iranian blue chalcedony, and current political tensions
have made it difficult to obtain a specimen for examination.

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16   Harrell, James. (2012). Gemstones. *UCLA Encyclopedia of Egyptology* 1.1.
17   www.iranian-agates.freeservers.com/photo.html.

On the topic of Persians and agates, Pliny wrote that "medicine men use a type of agate, which is resemble to the lion's skin, to treat scorpion's sting".[18] Persians today believe that agate could be useful to avoid storms and thunderbolts. While there is no ancient source that I could locate that testifies to such a belief, it is strongly reminiscent of the thunderstone motif of Indo-European heritage, which almost certainly originated in the mythology of the Proto Indo-Europeans. Indo-Europeanists have long known that the Proto-Indo Europeans connected the notions of 'sky' and 'stone', a theory first articulated by Johannes Schmidt (1865), famously developed by Hans Reichelt (1913),[19] and most recently reformulated by J Peter Maher. I shall briefly restate the argumentation here.

In Maher's articulation,[20] the Proto-Indo Europeans expanded their term for a stone axe, $*h_2é\acute{k}mō$, to 'stone' in general. From there, the term was applied to 'thunder' (perhaps by analogy to the sound of falling trees) and eventually to the sky. Maher's theory is too conservative. He criticizes the theories of Reichelt as being based on evidence that is too late, but cultures may preserve cultural elements over vast stretches of time. In particular, the notion that the sky was made out of precious stone, as argued by Reichelt, has rich documentation in ancient texts from the Semitic world.[21] In fact, the 'sky-stone' motif in Mesopotamian texts bears a striking parallel to the semantics of the Sanskrit word अश्मन् *áśman*.[22]

Sanskrit अश्मन् *áśman* possesses a series of meanings,[23] primarily 'a stone, a rock' but also a precious stone. It can also refer to a hammer metaphorically (historically, hammers were composed of a stone with a handle attached). However, the word also encapsulates the meanings 'thunderbolt', and 'firmament' which are far outside of the expected semantic range of the term. As such, we might understand अश्मन् *áśman* as meaning 'sky-stone' (to encapsulate both primary meanings). Sanskrit अश्मन् *áśman* derives from Proto-Indo-

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18   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 54.

19   Reichelt, Hans. (1913). Der steinerne Himmel. *Indogermanische Forschungen*, *32*(s1), 23–57.

20   Maher, J. Peter. (2011). "Stone," "Hammer," and "Heaven" in Indo-European Languages and Cosmology. *Approaches to Language: Anthropological Issues*, 457.
          Maher, J. Peter. (1974). HₐeḱmonꞋ: "(Stone) Axe" and "sky" in I-E / Battle Axe Culture. In: *Papers on Languages Theory and History 1*.

21   Huxley, Margaret. (1997). The shape of the cosmos according to cuneiform sources. *Journal of the Royal Asiatic Society*, *7*(2), 189–198.

22   Гликман, М. Л. (2020). *Ключ к камням хошена*. Тель-Авив. 133.
          Glikman, Moses. L. (2020). *The key to the hoshen stones*. Tel Aviv. 133. [Russian].

23   en.wiktionary.org/wiki/अश्मन्. Retrieved 9 March 2023.

Aryan *Háśmā, from Proto-Indo-Iranian *Háćmā, from Proto-Indo-European *h_2éḱmō. I am not suggesting, of course, that this motif originates among Sanskrit speakers, only that the Vedic evidence attests to its antiquity among Indo-Aryans.

The incredible phonetic resemblance between *yaspay- and Proto-Indo-Iranian *Háćmā is difficult to ascribe to coincidence. Proto-Indo-Iranian *H was a glottal stop /ʔ/,[24] and *ć was realized as a sibilant in reflexes. The labial nature of /p/ compared to /m/ is also quite comparable. In light of the celestial nature of sky-stone, perhaps the Proto-Indo-Iranian *Háćmā was suffixed with the hypocoristic suffix *-iya?.[25] A fossil of this word may remain in New Persian یشم yašm and یشپ yašp, which have since undergone semantic narrowing to become restricted to jade.[26] These forms are not borrowed from Arabic so are likely inherited from earlier stages of the language. The existence of byforms again implies interlinguistic borrowing, analogous to the Akkadian examples. The earliest attestation of this word in an Iranian text is in a Sogdian translation of a Chinese Buddhist text from the 8th century CE (where the form ʾyšp(h) appears),[27] far too late to be useful in clinching an Iranian etymology.

Precious stones were particularly liable to be exported to foreign countries (this is still true today), and the native term for the stone was often imported in tow. It is far more difficult to reconstruct what else may have come along. It is possible that the mythology around a particular object may have been imported as well, such as the sky-stone which can be reconstructed in Proto-Indo-European mythology. In the scenario I propose, an Indo-Iranian speaking group discovered Iran's blue chalcedony, which they termed 'divine heaven-stone'. They traded this gemstone with the Mesopotamians to their west, afterwards traveling even to Canaan.

24   Lubotsky, Alexander, Klein, Jared, Joseph, Brian, & Fritz, Matthias. (2018). Indo-Iranian: the phonology of Proto-Indo-Iranian. *Handbücher zur Sprach-und Kommunikationswissenschaft= Handbooks of linguistics and communication science*, 1875–1888.

25   Schmitt, Rüdiger. (1996). On Old Persian hypocoristics in-iya. *TRENDS IN LINGUISTICS STUDIES AND MONOGRAPHS*, *90*, 163–170.

26   Melikian-Chirvani, Assadullah Souren. (1997). Precious and Semi-Precious Stones in Iranian Culture Chapter I. Early Iranian Jade. *Bulletin of the Asia Institute*, *11*, 123–173.

27   Ibid.

6   Conclusion

Hebrew יָשְׁפֶה *yošpe* has traditionally been a difficult stone to identify given the number of misleading cognates in other languages. A number of distinct minerals were referred to by its cognates. Therefore, it is challenging to determine exactly which mineral(s) were intended by יָשְׁפֶה *yošpe*. Blue chalcedony is called *ašpû* in Akkadian (confirmed by *yašpu* 'blue chalcedony' in Elamite). Epiphanius claimed that blue chalcedony was the "ancient iaspis", indicating that blue chalcedony may be the stone originally referred to by this culture-word. The Septuagint's usage of βήρυλλος *beryllos* 'aquamarine' to translate יָשְׁפֶה *yošpe* strongly suggests that יָשְׁפֶה *yošpe* should be specifically identified with blue chalcedony. The ultimate source of the term יָשְׁפֶה *yošpe* may lie in a now lost Indo-Iranian form.

שָׁמִיר *Šāmīr*—Emery

Having exhausted the stones adorning the חֹשֶׁן *ḥōšen*, we turn to a thirteenth species not found on it, yet almost certainly utilized in its creation. Known as שָׁמִיר *šāmīr*, this enigmatic substance never explicitly referred to as a stone was employed by Ancient Israelites for engraving gemstones.

Three biblical references to שָׁמִיר *šāmīr* are extant, all in the Prophets. Jeremiah 17:1 suggests שָׁמִיר *šāmīr* was used to engrave tablets—בְּצִפֹּרֶן שָׁמִיר חֲרוּשָׁה עַל־לוּחַ לִבָּם "engraved with a nail of *šāmīr* on the tablet of their hearts". Zecharia 7:12 implies שָׁמִיר *šāmīr* was hard—וְלִבָּם שָׂמוּ שָׁמִיר "they hardened their hearts as *šāmīr*". Ezekiel 3:9 compares שָׁמִיר *šāmīr* with rock crystal—כְּשָׁמִיר חָזָק מִצֹּר "like *šāmīr*, harder than rock crystal" (see Chapter 16). The characteristic hardness of שָׁמִיר *šāmīr* described in the biblical text motivates modern translators to identify שָׁמִיר *šāmīr* with diamond, for what mineral is harder? This view even has Zohar Amar's support, as שָׁמִיר *šāmīr* was translated into Arabic as أَلْمَاس *ʾalmās* 'diamond'.[1] But diamonds were unknown in the Mediterranean until the Roman period,[2] so while 'diamond' is a legitimate possibility for Arabic أَلْمَاس *ʾalmās*, it cannot be for שָׁמִיר *šāmīr*. The pervasive translation of שָׁמִיר *šāmīr* as 'diamond' must be reevaluated.

To offer an alternative identification for שָׁמִיר *šāmīr*, it is essential to determine which substances were used to engrave stones in the Bronze-Iron Ages. The Septuagint translated שָׁמִיר *šāmīr* by the Greek lookalike σμύρις *smyris* 'emery'. Emery is an impure form of the mineral corundum (Al_2O_3), also known as corundite.[3] Corundum is better known for its colorful crystals (ruby, sapphire) and hardness (absolute hardness of 400[4]), but corundum unsuitable for gemstones may be used as an abrasive to carve, engrave, and polish gemstones. Emery was mined and crushed into a powder, which might then be separated by particle size, as different particle sizes were suited to varying applications.

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1   Amar, Zohar. (2016). The Ephod, The Stones of the Priestly Breastplate, and the Shamir. *Hamaʾayin Gilyon*. Nisan, 5776. 41–59. [Hebrew] www.zoharamar.org.il/wp-content/uploads/אפוד-המעין-PDF.pdf

2   Amar, Zohar, & Lev, Efraim. (2017). Most-cherished gemstones in the medieval Arab world. *Journal of the Royal Asiatic Society*, *27*(3), 377–401.

3   Mindat.org, entry: corundite. www.mindat.org/min-5138.htm. Retrieved on March 9, 2023.

4   Mukherjee, Swapna (2012). *Applied Mineralogy: Applications in Industry and Environment*. Springer Science & Business Media. 373.

The finest particles would be used for polishing, whereas larger grains would be set in lead and used to engrave and pierce semi-precious stones.

The equivalence of σμύρις *smyris* with emery offers a tentative identification. That σμύρις *smyris* referred specifically to emery (and not diamond) has been deduced from the fact that "corundum was the only mineral available to the Greeks that was hard enough for engraving varieties of quartz or other hard stones that were commonly used for seals".[5] Definitive evidence that emery was used as an abrasive in—for instance—Ancient Egypt has been hard to come by. Evidence for emery as an abrasive in Early New Kingdom Egypt comes from the Great Temple of the Aten. Residual grains of emery were found on a carved limestone block, thus demonstrating that emery was used as an abrasive.[6] Context thus favors an identification with emery, as emery was the only such abrasive available in the Bronze Age.

1   Cognates

שָׁמִיר *šāmīr* finds parallels in two Semitic languages, Aramaic and Arabic. The reflex in Aramaic is limited to JPA, JLA שָׁמִירָא *šāmīrā* and Classical Syriac ܫܡܺܝܪܳܐ *šmyr'*, a distribution and stem indicative of a loan from Hebrew. Arabic سامور *sāmūr* is likely a loan from Aramaic שָׁמִירָא *šāmīrā* because the 1ā2ū3 pattern is typical of Aramaisms. As the Aramaic and Arabic forms trace back to Hebrew, whereas the Hebrew form lacks an internal etymology, a non-Semitic origin ought to be considered.

Ancient Egyptian is in possession of a cognate as well, variously spelled *ꜣsmr* and *ysmr* (and *smr* by the Ptolemaic period). The earliest attestation of this word according to the *Thesaurus Linguae Aegyptiae* is in an inscription of Amenemhat II dated to 1878 BCE,[7] predating any other language. However, the varying spelling with *ꜣ-* ~ *y-* betrays this word as a borrowing, likely from outside Egyptian. Along these lines, Harris[8] claims that the Semitic and Egyptian

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5   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. Commentary on pages 147–148.

6   Serotta, A., & Carò, F. (2014). Evidence for the use of corundum abrasive in Egypt from the Great Aten Temple at Amarna. *Horizon*, 14, 2–4.

7   Brose, M. (2023). Annaleninschrift Amenemhets II. Fragment M. In: *Thesaurus Linguae Aegyptiae*. https://thesaurus-linguae-aegyptiae.de/text/S36FKQSICNFDLADBECABA64XXE. Accessed: 7 June 2024.

8   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 164.

forms derive from Sumerian ᴬAŠ.MUR '(a stone)', but **ᴬAŠ.MUR is a ghost word, a corruption of ᴬAS.ḪAR '(an arsenical compound)'.

While Theophrastus is the first Greek author to reference σμύρις *smyris*, he never refers to it by name. The reason for this omission, Caley & Richards suggest,[9] is that emery was called by a variety of names in 4th century BCE Greece. That a Greek word for emery was not yet fixed perhaps indicates that emery was a recent introduction to Greece. Dioscorides (1st century CE) wrote five books on the medicinal applications of various substances, and the first to describe σμύρις *smyris*. In Book 5, chapter 147 of his *De Materia Medica*,[10] Dioscorides describes σμύρις *smyris* as an abrasive for polishing and use in oral hygiene. Both properties fit emery, which is still used in toothpaste for the same purpose.[11]

An earlier connection to σμύρις *smyris* may be found in Herodotus, who uses the verb σμηρίζω *smerizo* to mean 'to abrade, smooth, polish'. Despite the phonological and semantic proximity, the verb σμηρίζω *smerizo* has not been connected with σμύρις *smyris*. Yet σμηρίζω *smerizo* follows the regular denominative verbalization pattern that would be expected from a noun like σμύρις *smyris* (compare λυγίζω *lygizo* 'to bend, flex', from λύγος *lygos* 'flexible twig'). Such a verb indicates that σμύρις *smyris* existed in Greek by Herodotus' time (5th century BCE), at least marginally. But Herodotus still postdates the latest biblical reference to שָׁמִיר *šāmīr* by centuries, so Greek cannot be the source of the Semitic and Egyptian forms.

2 The Etymology of שָׁמִיר *Šāmīr*

While the donor is unknown, the shape of the donor form may be reconstructed from the features of the reflexes. Between cognates exists a disparity in the initial element of the word. Hebrew שָׁמִיר *šāmīr* points to a proto-Hebrew form *$s_1amīr$-. On the other hand, the Ancient Egyptian cognate ꜣsmr ~ *ysmr* presents an initial vowel, as the consonant represented by ꜣ and *y*- in an unstressed syllable both shifted to a glottal stop /ʔ/ during the Middle King-

9 Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. Commentary on pages 148.

10 Dioscorides, *De Materia Medica*. 5, 147.

11 Wulknitz, P. (1997). Cleaning power and abrasivity of European toothpastes. *Advances in Dental Research*, 11(4), 576.

dom.[12] A third realization entirely is found with Greek σμύρις *smyris* ~ σμίρις *smiris*, which has a consonant cluster. All three forms are explicable if an initial consonant cluster **sm-* is reconstructed.

There appears to be a **sm-* initial consonant cluster, which was treated differently in reflex languages. Greek σμύρις *smyris* ~ σμίρις *smiris* has no trouble representing the initial consonant cluster. Initial consonant clusters required breaking in Semitic and Egyptian as they violate the phonotactics of the respective languages. This is generally accomplished by adding a prosthetic vowel (represented orthographically by a glottal stop) to the beginning of the word, breaking the cluster into two syllables, or by inserting a cluster-medial vowel.[13]

Whereas prosthetic vowel additions are common (as in, AE *ḥnmt* > אַחְלָמָה *ʾaḥlāmā*), examples of inserted cluster-medial vowels are far more elusive. This is exacerbated by the fact that inherited clusters are preserved in the Hebrew words for cardinal number 'two': Proto-Semitic **θn-* > *šn-* in שְׁנַיִם *šnayim* (masculine) and PS **θt-* > *št-* in שְׁתַּיִם *štayim* (feminine).[14] While this does not prove that the sequence *šm-* was tolerated phonotactically, it does advantage that possibility. Therefore, it is more likely that Hebrew acquired the inserted *-a-* from whatever intermediary language שָׁמִיר *šāmīr* was borrowed from, not a Hebrew-internal development.

As the attested cognate data is insufficient to identify the source of the loanword, it must be actively sought in the geographical vicinity of the source of emery.

2.1   *The Syrian Source*

One possible source of emery, and therefore ultimately of the word שָׁמִיר *šāmīr*, is Syria. Noonan[15] collected several sources which suggest that Egyptian and Mesopotamian emery originated in northern Syria. However, evidence for this particular source is rather weak. He argues a Syrian origin primarily because a particular variety of emery (NA4*šammu*, NA4U$_2$) is described as "Sutean", that being an Akkadian term for people then residing in Syria. Syria is a source of corundum, though it is noteworthy that terminology for emery in Mesopotamian languages differs entirely from Hebrew and Ancient Egyptian, so it is not

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12   Loprieno, Antonio. (1996). *Ancient Egyptian: a linguistic introduction*. United Kingdom: Cambridge University Press. 33, n. a-b.

13   Testen, David. (1998). Semitic Terms for "Myrtle": A Study in Covert Cognates. *Journal of Near Eastern Studies*, *57*(4), 281–290.

14   Hoberman, Robert D. (1989). Initial Consonant Clusters in Hebrew and Aramaic. *Journal of Near Eastern Studies*, *48*(1), 25–29.

15   Noonan, Benjamin J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. 210–211.

necessarily the case that the Mesopotamians acquired emery from the same source as the Israelites and/or Egyptians. A potential Turkish source—which Noonan mentioned in passing—has a stronger case.

2.2   *An Anatolian Source and Etymology*

Today, the area near Izmir is a source of emery,[16] and could have in antiquity. Due to the remarkable similarity between the ancient emery cultureword and *Izmir*, it is reasonable to explore whether there may be a direct connection between the lexemes.

Izmir, or as it was known before the Turks, Smyrna, is a name as old as the city itself. Ancient Greek three several forms which allow for the reconstruction of a Proto-Greek form **Smúrnā*: Aeolic Μύρρα *Myrra*, and Ionian, Attic Σμύρνα *Smyrna*, Σμύρνη *Smyrne*.[17] This toponym is found even earlier in Hieroglyphic Luwian as *Mira*, an Anatolian state in the 2nd millennium BCE that subsumed the area of Izmir. Luwian frequently drops *s*C- (contrast Luwian *parri-* with Hittite *ispar-* 'spread', Luwian *tummant-* 'ear' with Hittite *istāman-*), so *Mira* provides a good cognate. *Tišmurna* of central Anatolia has no relationship with Izmir, despite having been so connected in some of the literature.[18] On the basis of Luwian *Mira* and Proto-Greek **Smúrnā*, Izmir's name may be reconstructed as **SmVrna*.

While the form **SmVrna* may be reconstructed, the language in which this name originated is more challenging. While Anatolian languages—specifically Luwian—are known from Mira in second-millennium BCE, the lexicons of Anatolian languages are fragmentary. Before the Indo-Europeans conquered *Ḫattuša* the language of the city was Hattic. The name *Ḫattuša* derives from the Hattic word **ḫatt* 'silver', a meaning which has been demonstrated by the sumerogramic rendering of *Ḫattuša* as ᵁᴿᵁKÙ.BABBAR.[19] The derivation of *Ḫattuša* from **ḫatt* 'silver' demonstrates the existence of an Anatolian toponymic paradigm whereby a city was named for a mineral resource in its vicinity. As

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16   Heimpel, Wolfgang, Leonard Gorelick, and A. John Gwinnett (1988). Philological and archaeological evidence for the use of emery in the Bronze Age Near East. *Journal of Cuneiform Studies*, *40*(2), 195–210.

17   From the Wikipedia article on Izmir. No source is provided, but this claim seems reasonable to me. en.wikipedia.org/wiki/%C4%B0zmir#Names_and_etymology.

18   İreç, Muammer. (2018). Temelsiz Bir Lokalizasyon Önerisi Olarak tismurna-smyrna Özdeşliği (The Identification of Tišmurna-Smyrna as a Fallacious Localization Proposal). *TÜBA-AR Türkiye Bilimler Akademisi Arkeoloji Dergisi*, (22), 11–18. [Turkish] dergipark.org.tr/en/download/article-file/1726316

19   Giorgadze, Gregor G. (1988). On the Word for "Silver" with Reference to Hittite Cuneiform Texts. *Altorientalische Forschungen*, *15*(1–2), 69–75.

emery was exploited near Izmir, perhaps *SmVrna* is derived from a pre-IE word for emery. Our extremely limited understanding of Hattic deprives us of candidates for such a word. While there is no evidence that Hattic (or a related language) was ever spoken in Mira, naming schemes are often areal, spreading from language-to-language and culture-to-culture irrespective of phylogenetic boundaries.[20]

3   The Shamir Worm

The term שָׁמִיר *šāmīr* referred to emery (and was described as such) in rabbinic texts from the period of the Tanna'im and Emora'im. For example, the Tosefta's (Sotah 15:1) description of שָׁמִיר *šāmīr* being placed into a lead box is highly reminiscent of the Mesopotamian practice of setting emery grains into lead to use it.[21] The Geonim likewise understood שָׁמִיר *šāmīr* to be emery. Hayye Gaon quotes Saadia Gaon's *Words of the Mishna* that *šāmīr* is מאס *mās*,[22] a (Judeo-)Arabic backformation of Arabic الْمَاس *ʾalmās* 'emery'. While the textual, linguistic, and material evidence strongly suggests that *šāmīr* intends emery, this is not the only ancient interpretation of שָׁמִיר *šāmīr*.

Alongside the interpretation as 'emery', a legend developed that portrays *šāmīr* as a supernatural worm, perhaps the most memorable reinterpretation of a biblical lithonym. This reinterpretation could emerge because שָׁמִיר *šāmīr* was never explicitly mentioned as a stone in the biblical text, contrary to the usual practice of prefixing lithonyms with אֶבֶן *ʾeben* 'stone' + [specific name] (see Chapter 12). Why the biblical text never uses the formation אֶבֶן שָׁמִיר *ʾeben šāmīr* can only be speculated at—perhaps emery was already an abrasive powder by the time the Israelites received it? Excluding the obvious allegorical accounts such as the story involving Solomon and Ashmodai, the *šāmīr*-worm is described as:

20   Tóth, Valéria. (2020). Theoretical considerations in the linguistic analysis of toponyms. In *Advances in Comparative Colonial Toponomastics* (pp. 1–22). De Gruyter.

21   Heimpel, Wolfgang, Leonard Gorelick, and A. John Gwinnett (1988). Philological and archaeological evidence for the use of emery in the Bronze Age Near East. *Journal of Cuneiform Studies*, 40(2), 195–210.
      Simkó, Krisztián. (2015). Emery abrasive in the lapidary craft of the Ur III period? Some further remarks on the stone ú-na4-gug and its Old Babylonian counterpart. *Aula orientalis: revista de estudios del Próximo Oriente Antiguo*, 33(1), 141–156.

22   Fuchs, Uziel. (2014). "Millot HaMishnah" by R. Saadia Gaon—the First Commentary to the Mishnah. *Sidra: A Journal for the Study of Rabbinic Literature*. 61–77.
      פוקס, עוזיאל. (2014). "מלות המשנה" לרב סעדיה גאון—הפירוש הראשון למשנה. סידרא: כתב-עת לחקר ספרות התורה שבעל-פה. 77–61.

– The size of a barleycorn[23]
– Placed in a lead cylinder[24]
– Causing stones to split when shown[25]

This description fits emery abrasive tools remarkably well. Emery grains, about the size of a barleycorn, would be set in lead to hold them in place.[26] A rather genius explanation of these characteristics was suggested by Slifkin,[27] who pointed out that snails of the genus *Euchondrus* literally etch into the limestone rocks of the Negev desert to eat the lichens found under the surface. Because limestone is significantly softer than precious stones, *Euchondrus* can etch into limestone, but would be incapable of engraving precious stones. But *Euchondrus* still may have inspired the *šāmīr*-worm.

To account for how *Euchondrus* fused with emery in legend, there must have been some opportunity for confusion between an obscure desert-snail and an industrial abrasive. Perhaps the excavatory habit of *Euchondrus* initially inspired Hebrew-speakers to name this very real snail שָׁמִיר *šāmīr*, because its feeding-habit is reminiscent of the lapidary engraving gemstones with emery. To people unfamiliar with this genus of snails, the description and name of this snail created confusion with emery. As scientific reality became legend, the qualities of the *šāmīr*-snail were blended with that of emery, creating the *šāmīr*-snail mythos. This is scenario speculative; it is challenging to reconstruct the historical scenario that gave rise to this legend.

While is clear that שָׁמִיר *šāmīr* referred to emery, the source of the word is uncertain. It may be possible to reconstruct an Anatolian substrate word for emery. Given the Anatolian toponymic paradigm in which a city was named for a mineral resource in its vicinity, resemblance between the cultureword **smVr* 'emery' and the toponym **SmVrna* 'Izmir' may be etymological. As emery was exploited near Izmir, perhaps the toponym **SmVrna* derived from a substrate word which may be reconstructed as **smVr-* 'emery', with a suffix *-na*. The legend of the *šāmīr*-worm evolved from the actual use of emery as an abrasive, or at least the elements thereof.

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23   Talmud Yershalmi, Sotah 9:3.

24   Ibid.

25   Talmud Bavli, Sotah 48b.

26   Heimpel, Wolfgang, Leonard Gorelick, and A. John Gwinnett (1988). Philological and archaeological evidence for the use of emery in the Bronze Age Near East. *Journal of Cuneiform Studies*, 40(2), 195–210.

27   Slifkin, Nosson. (2007). *Sacred Monsters: Mysterious and Mythical Creatures of Scripture, Talmud and Midrash*. Zoo Torah.

גְּבִישׁ *Gāḇīš* & אֶלְגָּבִישׁ *ʾelgāḇīš*—Crystal Quartz, Gypsum & Hail

The words גְּבִישׁ *gāḇīš* and אֶלְגָּבִישׁ *ʾelgāḇīš* are found in some of the earliest written word, yet descendants of these words are still in use today. This pair of words—visibly related—have been misunderstood due a piecemeal approach to philology by Semitic lexicographers, hampered by the ambiguity of the verses they feature in. There is a scarcity of useful textual information available in any single language, and some references are even contradictory. A little information may be conveyed by texts in one language, but taken in isolation from cognates, it is insufficient to make an identification. In some texts, (ʾel)gāḇīš is described as extremely common and worth little, while in others it is described as very valuable. But this frustrating quality can enlighten us into the way the ancients conceived of clear colorless crystalline minerals. By treating the references to this word across languages as a single corpus, a clearer understanding will emerge that can be applied across cognates.

1 Previous Hypotheses

There are too many cognates of (ʾel)gāḇīš to individually treat, as cognates occur in nearly every ancient language of the east Mediterranean. It is peculiar that the ubiquity of this cultureword has neither led to a solid identification nor the language of origin. Noonan interpreted (ʾel)gāḇīš as some sort of dark-colored stone.[1] Exactly which species, he is unclear on. Noonan recognizes it as a cultureword without a discernible origin, suggesting that "this ancient culture word may have originated somewhere to the north." While his collection of cognates is impressive, his analysis does not resolve the stone's identity or origin.

Recently, Jonathan Thambyrajah wrote an extensive treatment of the word.[2] He counterintuitively suggests that אֶלְגָּבִישׁ *ʾelgāḇīš* and גְּבִישׁ *gāḇīš* are unre-

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1 Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 53–54.

2 Thambyrajah, Jonathan. (2021). A New Etymology for Hebrew אֶלְגָּבִישׁ and Related Lexemes. *Zeitschrift für die alttestamentliche Wissenschaft, 133*(3), 346–360.

lated, the former deriving from Ancient Egyptian ꜣnr km (literally, 'black stone') through Hurrian (he neglects to provide an etymology for גַּבְיש gāḇīš). However, his analysis missed several important cognates that undermine his hypothesis. He interprets the first element of אֶלְגָּבִיש ʾelgāḇīš as deriving from Egyptian ꜣnr 'rock', which the author duly notes is ancestral to Demotic Egyptian ỉny and Coptic ⲱⲛⲉ *one*. But the Coptic reflex ∅ indicates that /l/ was absent from Egyptian ꜣnr. Together, these forms enable the reconstruction of ꜣnr as something like *ʔan(V)r, prior to the New Kingdom.[3] But the Coptic evidence does not stop Thambyrajah from claiming that "[t]he phonetics of the word ỉnr are not straightforward."

Yet paragraphs of phonological apologetics are unable to save his etymology. He manages to somehow confuse syllabic writing with normal transcription: syllabic [nr] may correspond to /l/, but that is in the transcription scheme particular to foreign words,[4] ꜣnr certainly not among them. Regardless, ꜣnr km 'black granite' would be an inappropriate identification for אֶלְגָּבִיש ʾelgāḇīš and its family of cognates. Lastly, there is no evidence for ꜣnr km in Hurrian, and no reason to believe it was ever borrowed into that language.

One of the stronger pieces of evidence as to the identity of this stone is a passing line in the Mesopotamian myth of *Lugal-e. Lugal-e* states, ^{NA4}algameš sa_2 dug_4 ud-da gur_3-ru zadim-e-ne he_2-me-en "algameš-stone, you shall be the daily regular fare brought to the stone workers" (Lugal-e, 522–527[5]). Akkadian *algamiš* has been previously misidentified with amber,[6] despite the fact amber is certainly not an appropriate candidate for the commonest stone in Mesopotamian workshops. This problem was created in the secondary literature by improper association of *algamiš* and *elmēšu* (*amber* is also an inappropriate identification for *elmēšu*, see Chapter 18). Stieglitz[7] posited that *algbṯ* in Ugaritic referred to basalt, drawing support from Ugaritic texts that mentioned the trade of *algbṯ* by the talent, interpreted through the association with אֶלְגָּבִיש ʾelgāḇīš, mentioned in Ezekiel as falling after a volcanic eruption. Along a simi-

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3　For more precise reconstructions of this word, see: Kilani, Marwan. (2019). *Vocalization in Group Writing: A New Proposal*. Widmaier Verlag.

4　Or more precisely, words without a fixed scribal tradition, as Marwan Kilani suggested in a lecture.

5　Peterson, Jeremiah. (2019). The literary Sumerian of Old Babylonian Ur: UET 6/1–3 in transliteration and translation with select commentary. *Cuneiform Digital Library Initiative* (CDLI). 22.

6　Ghemiş, Călin. (2007). Issues on Pre and Protohistoric Amber. *Crisia*, *37*, 7–22.

7　Stieglitz, Robert R. (1979). Commodity prices at Ugarit. *Journal of the American Oriental Society*, 15–23.

lar line of reasoning, Shah[8] identified Akkadian *algamiš* with steatite. But none of these identifications are definitive.

A letter from Hatti to Ugarit (Ras Shamra 20.225A) equates the ideogram NA4.MEŠ GE6 ('dark stones') with Akkadian *alkabašu*. Some have thus concluded from this that Akkadian *alkabašu*, and all of its cognates must have been dark-colored. But this evidence is faulty. NA4.MEŠ GE6 is mentioned alongside NA4.MEŠ UD, equated with Akkadian *kabdu*. The normal ideogram for *algamešu* is NA4UD.SAL.ḪUB, which shares the element UD with NA4.MEŠ UD. The sign UD in NA4UD.SAL.ḪUB should be read *babbar* 'white', which indicates that *algamešu* was a white stone. Thus, it is very likely that the ideograms NA4.MEŠ GE6 and NA4.MEŠ UD have been metastasized, and NA4.MEŠ GE6 ('dark stones') should be equated with *kabdu*. To the inversion of the usual reading of this text, it confirms that *alkabašu*/*algamešu* was a white stone.

2 Phonological Analysis

The unusual name of this stone is striking: אֶלְגָּבִישׁ *ʾelgāḇīš* is composed of five consonantal radicals, which betrays that it is a loan from a non-Semitic language. The Book of Job contains a shortened form of the same lexeme—גָּבִישׁ *gāḇīš*, a *hapax legomenon*. Both the long and short forms possess many cognates across the Levant: Sumerian *algameš*, Eblaite *urgubasu*, Ancient Egyptian (*irqbs*, *irgbs*), Sumerian (AL.GU.PEŠ7, NA4*algameš*, NA4*al.gam.eš*, NA4(UD.)SAL.ḪÚB), Akkadian (*algamešu*, *algamisu, algamišu, gamēsu*), Ugaritic (*ʾilqṣm*, *ʾilgbt*).[9] Noonan[10] argues that Hebrew *ʾelgāḇīš* and Ugaritic *ʾilgbt* are cognate and represent a separate borrowing from the Akkadian forms. Because of the complex manifestations of this word in ancient Semitic languages, it is difficult to determine the original sequence of borrowing.

Looking beyond the first glance, *irqbs*, *irgbs* are good cognates to אֶלְגָּבִישׁ *ʾelgāḇīš*. The [r] in Egyptian *irqbs*, *irgbs* is merely a transcription of /l/. Some academics (described by Klein[11]) believe that the initial two consonants /ʔl-/ reflect the Arabic definite article *al-*, but this is chronologically impossible,

8   Shah, Bipin. *Ancient Kingdom of Magan*. (unpublished paper).

9   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 53–54.

10   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 53–54.

11   Klein, Ernest, & Rabin, Ḥayyim. (1987). *A comprehensive etymological dictionary of the Hebrew language for readers of English*. Carta Jerusalem. Entry: אֶלְגָּבִישׁ.

as the Arabic definite article *al-* did not develop until long after the texts at issue were composed.[12] Some variation of the hypothesis recorded in CAD[13] is more reasonable; a series of sound changes eliminated the first consonant *algamēsu* > **aggamēsu* > *gamēsu*. To better account for the differences in the initial vowel, an even simpler route would posit an initial cluster **lg-* that was broken up either by inserting a prosthetic vowel or by dropping the first consonant: **lgamV̄s* > V*lgamV̄s-*, *gamV̄s-*.

3   Hebrew Sources for אֶלְגָּבִישׁ *ʾelgāḇīš*

אֶלְגָּבִישׁ *ʾelgāḇīš* is mentioned three times in the Book of Ezekiel. In Ezekiel 13:10–13, אֶלְגָּבִישׁ *ʾelgāḇīš* is mentioned twice, which the Septuagint translates as λίθοις χαλάζης *lithois chalazes* 'hailstones' and πετροβόλους *petrobolous* 'stone missile':

יַעַן וּבְיַעַן הִטְעוּ אֶת־עַמִּי לֵאמֹר שָׁלוֹם וְאֵין שָׁלוֹם וְהוּא בֹּנֶה חַיִץ וְהִנָּם טָחִים אֹתוֹ תָּפֵל:

Inasmuch as they have misled My people, saying, "It is well," when nothing is well, daubing with plaster the flimsy wall which the people were building,

אֱמֹר אֶל־טָחֵי תָפֵל וְיִפֹּל הָיָה גֶּשֶׁם שׁוֹטֵף וְאַתֵּנָה אַבְנֵי אֶלְגָּבִישׁ תִּפֹּלְנָה וְרוּחַ סְעָרוֹת תְּבַקֵּעַ:

say to those daubers of plaster: It shall collapse; a driving rain shall descend—and you, O great *ʾelgāḇīš*, shall fall—and a hurricane wind shall rend it.

וְהִנֵּה נָפַל הַקִּיר הֲלוֹא יֵאָמֵר אֲלֵיכֶם אַיֵּה הַטִּיחַ אֲשֶׁר טַחְתֶּם

Then, when the wall collapses, you will be asked, "What became of the plaster you daubed on?"

לָכֵן כֹּה אָמַר אֲדֹנָי יְהוִה וּבִקַּעְתִּי רוּחַ־סְעָרוֹת בַּחֲמָתִי וְגֶשֶׁם שֹׁטֵף בְּאַפִּי יִהְיֶה וְאַבְנֵי אֶלְגָּבִישׁ בְּחֵמָה לְכָלָה:

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12   Al-Jallad, Ahmad. (2020). Pre-Islamic Arabic. *Arabic and contact-induced change*, 1, 37.

13   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry *gamēsu*.

Assuredly, thus said the Lord GOD: In My fury I will let loose hurricane winds; in My anger a driving rain shall descend, and great *ʾelgābīš* in destructive fury.

Likewise, in Ezekiel 38:22 אֶלְגָּבִישׁ *ʾelgābīš* is described as something destructive.

וְנִשְׁפַּטְתִּי אִתּוֹ בְּדֶבֶר וּבְדָם וְגֶשֶׁם שׁוֹטֵף וְאַבְנֵי אֶלְגָּבִישׁ אֵשׁ וְגׇפְרִית אַמְטִיר עָלָיו וְעַל־אֲגַפָּיו
וְעַל־עַמִּים רַבִּים אֲשֶׁר אִתּוֹ:

I will punish him with pestilence and with bloodshed; and I will pour erosive rain, stones of *ʾelgābīš*, fire and sulfur upon him and his hordes and the many peoples with him.

It has been unnoticed by philologists that אֶלְגָּבִישׁ *ʾelgābīš* survived in spoken Hebrew through the Mishnaic period. A perplexing *baraytha* is quoted in the Talmudic tractate of *Bərakhoth*,[14] which lists the natural phenomena through which a divine sign (נֵס *nēs*) occurred that one must recite a blessing upon observing. One of those is:

אַבְנֵי אֶלְגָּבִישׁ בְּמוֹרַד בֵּית חוֹרוֹן

ʾelgābīš-stones in the descent of Beth Horon

As later clarified by the *gemara*, this *baraytha* is describing the incident of Joshua 10. The army of Israel pursued the routed forces of five Canaanite cities, and God unleashed hailstones—specifically described as אַבְנֵי הַבָּרָד *ʾabnē habbārāḏ* 'hailstones'—against the fleeing armies (Joshua 10:11). Thus the *baraytha* informs us that a person who sees *hail* in the descent of Beth Horon recalls the event in Joshua. Therefore, אֶלְגָּבִישׁ *ʾelgābīš* must refer to hailstones, as the Septuagint suggests. However, 'hail' does not suit the cognates in other ancient languages, suggesting something else at work. In Akkadian sources, *algamiš* is described as "the commonest (stone) in my workshop, you shall be ready for any work to be done on you." Ugaritic *algbṯ* is traded by the talent.[15] These sources cannot be describing ice.

There is a critical cognate which has remained unrecognized. I propose an etymological relationship between the אֶלְגָּבִישׁ *ʾelgābīš* cognate family and

14   Babylonian Talmud, tractate Berachot, 54a.

15   Stieglitz, Robert R. (1979). Commodity prices at Ugarit. *Journal of the American Oriental Society*, 15–23.

Greek γύψος *gypsos* 'gypsum'. Gypsum ($CaSO_4 \cdot 2H_2O$) is a colorless-white min-eral, which was carved into vessels (often conflated with limestone vessels under the imprecise term 'alabaster'[16]) and used to make plaster. Gypsum is a good fit for Akkadian *algamiš* and Ugaritic *algbt*. Gypsum was commonly used in Mesopotamia to carve alabaster [*sic*] vessels, and it would be traded by the talent to be used for plaster. The meaning 'gypsum' for אֶלְגָּבִישׁ *ʾelgāḇīš* is indirectly indicated by the proximal reference to the 'daubers of plaster (טִיחַ)'. Gypsum-based plaster-of-Paris was in common use in Mesopotamia,[17] and Theophrastus describes production in both Phoenicia and Syria.[18]

Further confirmation that אֶלְגָּבִישׁ *ʾelgāḇīš* intended gypsum can be found in a curious borrowing into Ancient Egyptian. Akkadian *gaṣṣu* (assimilated from **gapṣu*) was loaned into New Kingdom Egyptian as *qa=ḏu* 'gypsum'[19] (spelled variously). At Amarna, two pieces of gypsum inscribed "*qa=ḏu*" and a date were found.[20] This confirms that Akkadian *gaṣṣu* was gypsum, which signals a historical change in architectural technology. Gypsum plaster was common in Ancient Mesopotamia, but rare in Egypt prior to the Amarna period.[21] A pre-New Kingdom word for gypsum has eluded discovery. Egyptian *qa=ḏu* 'gypsum' may have been imported by Mesopotamian craftsmen, as it first appears in the Eighteenth dynasty despite gypsum plaster being known long before.[22]

4   On גָּבִישׁ *Gāḇīš*

Similar in form to אֶלְגָּבִישׁ *ʾelgāḇīš* but dissimilar in meaning, גָּבִישׁ *gāḇīš* is a true hapax legomenon with a charismatic provenance. As גָּבִישׁ *gāḇīš* is mentioned in Job 28:18 alongside two coastal imports, רָאמוֹת *rāmōṯ* 'seashells' and פְּנִינִים

16   Harrell, James A. (1990). Misuse of the term "alabaster" in Egyptology. *Göttinger Miszellen*, *119*, 37–43.

17   Firth, Richard. (2011). A Discussion of the Use of im-babbar2 by the Craft Workers of Ancient Mesopotamia. *Cuneiform Digital Library Journal*, *2*, 6–2.

18   Eichholz, D.E. (1967). Some Mineralogical Problems in Theophrastus' De Lapidibus. *The Classical Quarterly*, *17*(1), 103–109.

19   Hoch, James E. (2014). *Semitic words in Egyptian texts of the New Kingdom and Third Intermediate period*. Princeton University Press. Entry 442.

20   Harris, J.R. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). 15, 90.

21   Personal correspondence with Harrell.

22   Harrell, James A. (2017). Amarna gypsite: A new source of gypsum for ancient Egypt. *Journal of Archaeological Science: Reports*, *11*, 536–545.

pənīnīm 'beads, pearls', certain medieval commentators (Isaacides, Gersonides) interpreted גְּבִישׁ *gāḇīš* as some sort of precious stone from the sea. This was a remarkably good hunch.

רָאמוֹת וְגָבִישׁ לֹא יִזָּכֵר וּמֶשֶׁךְ חָכְמָה מִפְּנִינִים:

> Seashells and *gāḇīš* cannot be mentioned with it; A pouch of wisdom is better than pearls.

Koller's papyrus (dated to the 19th dynasty) contains a list of products imported from Nubia. One of these products was *írqbs*,[23] which implies that Nubia was probably the original source of *írqbs*. Job 28:18 may also be hinting at a Nubian provenance for גְּבִישׁ *gāḇīš*, reading that verse in parallel with Job 28:19, which mentions פִּטְדַת־כּוּשׁ 'peridot of Nubia' (see Chapter 4). The references to *írqbs* and גְּבִישׁ *gāḇīš* in Koller's papyrus and Job evidently cannot be to gypsum or hail. Gypsum was not a precious item and certainly did not require transportation all the way from Nubia. Nor can ice be a viable identification, for reasons not needing explanation. To Hebrew גְּבִישׁ *gāḇīš* and Egyptian *irqbs* may be added Akkadian *gamēsu*, which was associated with a silver mirror and employed as a pendant,[24] so it too can be inferred to be a precious stone. To the previously established meanings *hail* and *gypsum*, a third meaning, a gemstone, must be added. Three clues as to the identity of this stone: it must be 1) a gemstone 2) from Nubia 3) akin to gypsum and ice..

That identity is all but equivocal. Meeks[25] mentioned a mummy cartonnage (Egyptian Museum of Berlin artifact number ÄM 20135) from the Third Intermediate Period which mentions that an associated statue of Osiris was carved from *írgbs*. Allegedly, this statue was carved from crystal quartz. This is materially plausible; during the Middle Kingdom, the Ancient Egyptians carved Nubian crystal quartz into various objects. Unfortunately, this cartonnage has been missing since the Second World War, and no photographs survive.[26] But if this description is correct, it would confirm the meaning 'crystal quartz'

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23   Gardiner, Alan H. (1911). *Egyptian hieratic texts*. Ripol Classic. Page 41.

24   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry *gamēsu*.

25   Meeks, Dimitri. (1997). Les emprunts egyptiens aux langues semitiques durant le Nouvel Empire et la Troisieme Periode Intermediaire: Les aleas du comparatisme. *Bibliotheca orientalis*, *54*(1), 32–61.

26   I am appreciative to Dr. Caris-Beatrice Arnst at the Ägyptisches Museum und Papyrussammlung for her help identifiying the catelogue number and finding the history of thes artifacts.

for Egyptian *írgbs*.[27] Egyptian *írgbs*, *írqbs* 'crystal quartz' is more morphologically similar to אֶלְגָּבִישׁ *ʾelgāḇīš* 'gypsum, hail', rather than גָּבִישׁ *gāḇīš*, yet 'crystal quartz' suits Akkadian *gamēsu* and Hebrew גָּבִישׁ *gāḇīš* precisely.

Crystal quartz is the perfect candidate. Quartz crystals are found in the mountains overlooking the southwestern coast of the Red Sea, in historical Nubia (Kush). The Nubian Kerma culture made beads out of quartz crystals in their natural shape, sometimes coating them in a copper-based glaze to produce a striking appearance.[28] This craft continued into the 1st millennium.[29] Crystal quartz was also accessible to the Iron Age Judeans, a Judean stamp seal dating to the seventh-century BCE is carved out of crystal quartz.[30] Though the provenance of the quartz is unknown, Nubia should be considered a strong possibility. Equating Ezekiel's אֶלְגָּבִישׁ *ʾelgāḇīš* (correctly identified with 'hail') with Job's גָּבִישׁ *gāḇīš*, and factoring in Pliny's[31] theory that quartz is supercooled ice, some scholars decided that גָּבִישׁ *gāḇīš* should be identified with *crystal*. While the reasoning that led to this conclusion is questionable, the conclusion is strong.

The interpretation of גָּבִישׁ *gāḇīš* as crystal quartz is even supported by the translation found in the Targum to Job, which translates גָּבִישׁ *gāḇīš* as בִּירוּלִין *bīrūlīn*[32]—an Aramaic rendering of Greek βηρύλλιον *beryllion*, which referred to aquamarine (light blue) and colorless beryl.[33] Colorless beryl and crystal quartz possess a similar appearance and properties. However, colorless beryl was imported at the earliest during the Roman period, and then was used only for engraving (Moh's 7.5–8) rather than as a gemstone. Some scholars cite Neo-Assyrian *burallu*[34] as a cognate of βηρύλλιον *beryllion*, but it is a false cognate. Neo-Assyrian *burallu* denotes the material of a stone bowl or perhaps a spoon, wholly inappropriate uses for beryl.

27   My thanks go out to Julien Cooper for bringing this to my attention.

28   Markowitz, Yvonne J, & Doxey, Denise M. (2014). *Jewels of ancient Nubia*. MFA publications. https://www.mfa.org/collections/publications/jewels-ancient-nubi. Retrieved on March 9, 2023.

29   The above information was relayed to me by James Harrell in conversation.

30   https://www.imj.org.il/en/collections/379829. Retrieved on March 9, 2023.

31   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 9.

32   Targum to Job 28:18.

33   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

34   Kogan, Leonid. & Krebernik, Manfred. (2020). *Etymological Dictionary of Akkadian. Volume 1 Roots beginning with p and b*. Berlin, Boston: De Gruyter. 276–277.

The meanings associated with אֶלְגָּבִישׁ ʾelgāḇīš (gypsum and ice) do not suit גְּבִישׁ gāḇīš. Based on comparison with Akkadian gamēsu and particularly with Egyptian írgbs, the meaning 'crystal quartz' may be established. Akkadian gamēsu was a precious stone, and Egyptian írgbs ~ írqbs must refer to crystal quartz based on the Nubian provenance implied from Koller's papyrus and the Osiris statuette of quartz called "írgbs". Medieval commentators noted that גְּבִישׁ gāḇīš sounds like a product from the sea; and Nubian crystal quartz would probably have arrived in Canaan from trade over the Red Sea. Thus, crystal quartz would seem to be the identify of גְּבִישׁ gāḇīš beyond a reasonable doubt.

5 History in Other Languages

Having established similar but divergent meanings for גְּבִישׁ gāḇīš and אֶלְגָּבִישׁ ʾelgāḇīš, it remains to be explained how Classical Hebrew ended up with a pair of nearly identical words for similar entities. While reborrowings are common macrolinguistically, within Classical Hebrew they are all but unheard of. But this unique lexical development can be partially explained through contextualization with other ancient cognates, many of which have not been previously recognized. For this purpose, it would be over-excessive to analyze every form in every ancient language, but it is proper to briefly reanalyze the sequence of borrowing and semantic change from the earliest attestation of this culture-word until the Common Era.

The earliest attested cognates of אֶלְגָּבִישׁ ʾelgāḇīš are as early as writing itself, written in Eblaite (urgubasu) and Sumerian (NA4algameš) cuneiform. The original Sumerian name for gypsum was imbabbar, a compound of im 'clay, mud' + babbar 'white'.[35] The Akkadian equivalent of Sumerian imbabbar is Akkadian gaṣṣu. I note however, that the form algameš is found in Old Akkadian as well.[36] I suggests that the difference between gaṣṣu and algameš was the grade of material: powdery gypsum (gaṣṣu) would be used to make plaster, whereas gypsum-alabaster rock (algameš) would be carved into objects. Akkadian gaṣṣu gave rise to Aramaic גִּצָּא giççā 'lime', which was loaned into Mishnaic Hebrew as גֵּץ gēç and Arabic as جص jaṣṣ, جِصّ jiṣṣ 'lime'. Akkadian gaṣṣu was

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35   Firth, Richard. (2011). A Discussion of the Use of im-babbar2 by the Craft Workers of Ancient Mesopotamia. *Cuneiform Digital Library Journal*, 2, 6–2.

36   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *algameš*.

also unexpectedly loaned into New Kingdom Egyptian, as *qa=ḏu* (spelled variably) 'gypsum'.[37] This may have happened through imported Mesopotamian craftsmen,[38] as the Akkadian word seems to have displaced the native Egyptian word.

Akkadian *gaṣṣu* would appear to be a product of anticipatory assimilation to an adjacent segment, whereby */gapt͡s'u/ assimilated to [gaṣṣu] */gat͡s's'u/. Thus even Akkadian's most ancient word for '(powdered) gypsum' is a part of this family, reflecting a donor with a shape like *gapsu. This unattested also gave rise to Greek γύψος *gypsos* 'gypsum, chalk, cement', which first appears in Herodotus.[39] The vowel may be a spontaneous vowel-change */a/ > /u/ under the labial influence of /p/. Late Hebrew ס-פ-ג *g-p-s* 'to plaster', and Arabic جِبْس *jibs* must be borrowings from Greek γύψος *gypsos*.

6　　Semantics

Our new understanding may allow us to better understand the use of the term אֶלְגָּבִישׁ *ʾelgāḇīš* in Ezekiel. Theologians and scholars over the millennia understood אֶלְגָּבִישׁ as 'hailstones' on the basis of the Septuagint where it is translated as λίθοις χαλάζης *lithois chalazes*, or on its usage in the *baraytha* in Bərakhoth. However, it is clear that the cultureword exemplified in אֶלְגָּבִישׁ *ʾelgāḇīš* originally intended 'gypsum', as evidenced by its cognates in Akkadian, NK Egyptian, and Greek. This meaning may be read back into the Hebrew text to generate a double-entendre: the plastered stones erected by men fall by the hailstones sent by God. Therefore, it is necessary to posit a semantic evolution from *gypsum* to *hail* in Hebrew. Because Ezekiel alluded to both meanings of the word, the semantic evolution must have still been in operation during the 6th-century BCE when the book was composed. By the Mishnaic period, אֶלְגָּבִישׁ *ʾelgāḇīš* firmly meant 'hail'.

This understanding clarifies the semantic distinction between אֶלְגָּבִישׁ *ʾelgāḇīš* and גָּבִישׁ *gāḇīš*. In Ezekiel, אֶלְגָּבִישׁ *ʾelgāḇīš* meant 'gypsum, hail', whereas the גָּבִישׁ *gāḇīš* of Job intended crystal quartz. The phenotypic similarity between the three substances is obvious. Gypsum, ice, and crystal quartz share

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37　　Hoch, *James E. Semitic words in Egyptian texts of the New Kingdom and Third Intermediate period*. Princeton University Press, 2014. Entry 442.

38　　Harrell, J.A. (2017). Amarna gypsite: A new source of gypsum for ancient Egypt. *Journal of Archaeological Science: Reports*, 11, 536–545.

39　　Beekes, Robert. (2009). *Etymological dictionary of Greek (2 vols.)*. Brill. Entry: γύψος.

the properties of being (semi-)transparent, colorless macrocrystalline substances. Of course, the three substances differ chemically and originate from different sources. Hail is ice (H_2O), gypsum is the mineral calcium sulfate dihydrate ($CaSO_4 \cdot 2H_2O$), and crystal quartz is a relatively pure macrocrystal of silicon dioxide (SiO_2). But without modern chemistry or technology for determining the composition and structure of clear colorless crystals, the nature of these substances would be less obvious or relevant to the ancients.

Because the meaning *hail* has been established as secondary and exclusive to Hebrew, it must be established whether the cultureword originally intended *gypsum* or *crystal quartz*. There is not enough information to establish the original meaning or language of origin with certainty, but I will venture an educated guess. Nubia has the strongest geographical association for this cultureword, and it is from Nubia that other nations acquired crystal quartz—but not gypsum. Gypsum is common around the world, so it was not valuable enough to be worthwhile trading over distance. Especially when dissolved in freshwater and recrystallized, gypsum forms attractive colorless and transparent crystals which resemble crystal quartz. Gypsum crystals are far too fragile and inclined to dissolve in water to be valued as a gemstone. Given the pattern of repeated borrowing of this word, the association with crystal quartz is probably more original.

Earlier in this chapter, I suggested that the existence of a "long" and "short" form of this cultureword coexisting in Hebrew and Akkadian may be accounted for by positing an initial cluster *lg-* that was broken up by inserting a prosthetic vowel *lgamV̄s → VlgamV̄s* or simplifying the consonant cluster *lgamV̄s → gamV̄s-*. This hypothesis would provide the best explanation for the fact that neither *gypsum* nor *crystal quartz* remains exclusive to either form. There are "long" forms meaning crystal quartz (Egyptian *ı́rgbs, ı́rqbs*), "long" forms meaning gypsum (Hebrew אֶלְגָּבִיש *ʾelgāḇīš*, etc.), "short" forms meaning crystal quartz (Hebrew גְּבִיש *gāḇīš*, Akkadian *gamēsu*), and "short" forms meaning gypsum (Greek γύψος *gypsos*). Therefore, a single form *lgamV̄s* 'crystal quartz' must have existed which soon thereafter acquired the secondary meaning 'gypsum', before differentiation into "long" and "short" forms with distinct meanings.

The transfer in meaning from crystal quartz to gypsum is not immediately logical from a functional point of view. Crystal quartz is hard, rare, water insolvent, and thus suitable for jewelry. Gypsum is soft, common, and easily dissolved in water. Functionally, the stones couldn't be more different. Yet the similarity of their appearance was sufficient to trigger a semantic broadening of the term to gypsum. Ancient people must have conceived of clear colorless crystalline substances as having a conceptual unity. One of the most famous

claims of Pliny is that κρύσταλλος *crystallos* 'crystal quartz' is supercooled ice.[40] This is evident from the word's primary meaning 'ice', and its derivation from κρύος *kryos* 'ice'. Again, ice and crystal quartz have little functional similarity, but great visual affinity. The underlying conceptual unity of clear colorless crystalline substances also explains why Ezekiel used a word that his readers understood as both plaster and hail, and why its etymon may designate crystal quartz.

The pair of Hebrew words אֶלְגָּבִישׁ *ʾelgāḇīš* and גָּבִישׁ *gāḇīš* are members of a complex of cognates from across the ancient world. The identities of this family have largely been obscured by semantic development, which generated three separate meanings. One must look towards coastal Nubia for the original identity of this stone, which originally meant 'crystal quartz', preserved in the meaning of גָּבִישׁ *gāḇīš*. From there, the cultureword shifted to the non-precious but superficially similar gypsum, which is the most common meaning among cognates. The use of the word אֶלְגָּבִישׁ *ʾelgāḇīš* in Ezekiel may be a double entendre, meaning 'gypsum', later developing 'hail' as a second meaning. 'Hail' completely displaced 'gypsum' in Late Hebrew.

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40   Bostock, John, and Henry T. Riley. (1855). Pliny the Elder: The natural history. *Perseus at Tufts*. Book 37, chapter 2 and 9.

כַּדְכֹּד *Kadkōḏ* & אֶקְדָּח *ʾeḳdāḥ*—Garnet

The lithonyms כַּדְכֹּד *kaḏkōḏ* and אֶקְדָּח *ʾeḳdāḥ* are textually and semantically linked to the extent that it is most appropriate to treat them together. Both terms are quite rare, *kaḏkōḏ* appearing twice and *eḳdāḥ* only once.

1   כַּדְכֹּד *Kadkōḏ*

כַּדְכֹּד *kaḏkōḏ* is absent from the Pentatech, only occurring in Isaiah and Ezekiel. The morphology of this word is vocalized slightly differently between these two verses: כַּדְכֹד *kaḏkōḏ* in Isaiah and כַדְכֹּד *kaḏkōḏ* in Ezekiel. The difference of the *daghesh* is trivial, but כַּדְכֹד might be preferred in light of its cognates (which will be examined further below) on an etymological basis.

> Isaiah 54:12
>
> וְשַׂמְתִּי כַּדְכֹד שִׁמְשֹׁתַיִךְ וּשְׁעָרַיִךְ לְאַבְנֵי אֶקְדָּח וְכָל־גְּבוּלֵךְ לְאַבְנֵי־חֵפֶץ
>
> I will make your battlements of *kaḏkōḏ*, your gates of *eḳdāḥ*, the whole encircling wall of gems.

> Ezekiel 27:16
>
> אֲרָם סֹחַרְתֵּךְ מֵרֹב מַעֲשָׂיִךְ בְּנֹפֶךְ אַרְגָּמָן וְרִקְמָה וּבוּץ וְרָאמֹת וְכַדְכֹּד נָתְנוּ בְּעִזְבוֹנָיִךְ:
>
> Aram traded with you because of your wealth of merchandise, dealing with you in turquoise, purple dyed-cloth, embroidery, fine linen, seashells, and *kaḏkōḏ*.

Within Biblical Hebrew, the phonemes /d/ (transcribed ⟨ד⟩) and /r/ (transcribed ⟨ר⟩)[1] are known to interchange on occasion. This phenomenon has been attributed to transcription error in older literature, but is better inter-

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[1] Meloni, Carlo. (2021). *The Resh Riddle: Identifying The Biblical Hebrew Rhotic* (Doctoral dissertation, Tel Aviv University).

preted as reflecting underlying phonetic interchange resulting from the similarity between /d/ and /r/.[2] In Classical Hebrew quadradical nouns (not adhering to the pattern $C_1C_2C_1C_2$), the second radical is usually /r/. This pattern is best explained as an effect of dissimilation of some medial geminates (in an Aramaic dialect?) which created a phonotactic allowance for loanwords of that structure. How best to account for the /ō/ is an entirely different issue, the underlying form must be either *karkād-* under the Canaanite shift or *karkudd-*. In Hebrew, the nominal pattern $C_1V_1C_2C_1V_2C_2$ is very common, and so *karkād-* or *karkudd-* could be easily modified to *kadkād-* or *kadkudd-*.

כַּדְכֹּד *kaḏkōḏ* is part of a family of ancient terms for some sort of gemstone. These include Arabic كَرْكَنْد *karkand* '(a red gemstone[3])', Classical Syriac ܩܪܩܕܢܐ *qarkeḏnā*, Sanskrit कर्केतन *karketana*, "chrysoberyl", Old Armenian կարկեհան *karkehan* (a red gem), Middle Persian *karkēhanēn*, Persian كركهان *karkahān*, ككهن *karkahan* 'amethyst' that passed into Arabic كَرْكُهَان *karkuhān*, كَرْكُهَن *karkuhan*, 'amethyst', Khotanese *kirkīyaṃ*, and most importantly Ancient Greek χαλκηδών *chalkedon*, χαλχηδόνιος *chalchedonios*, χαρχηδόνιος *charchedonios*. Due to the difficulty of identifying ancient lithonyms, the glosses provided for most of these words are approximations. Though *chalcedony* descends from Ancient Greek χαλκηδών *chalkedon*, χαλκηδών *chalkedon* is clearly used by Theophrastus, Pliny, and other authors to refer to garnet. As the most well described ancient cognate of כַּדְכֹּד *kadkōḏ*, χαλκηδών *chalkedon* is a particular asset in identifying כַּדְכֹּד *kadkōḏ*.

Garnet was exported to the international market from mines near Carthage, Caria (Anatolia), India, and the Black Sea region.[4] Χαλκηδών *chalkedon* was not the only Greek term for garnet. A synonym of χαλκηδών *chalkedon* was ἄνθραξ *anthrax*, to which Latin *carbunculus* may be added, which are all used interchangeably in Greco-Roman sources. Theophrastus describes garnet in chapter 18–19 of his Περὶ λίθων *On Stones* (excerpted):

> Αλλο δε τι γένος εστί λίθων ώσπερ εξ εναντίων πεφυκός άκαυστον όλως, άνθραξ καλούμενος, εξ ου και τά σφραγίδια γλύφουσιν, ερυθρον μεν τω χρώμχιτι, προς

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2   Howard, Jonathan. (2022). Phonetic Variance of /d/ and /r/ in Hebrew in Late Antiquity. *Journal of Semitic Studies*, *67*(2), 395–415.

3   Amar, Zohar, & Lev, Efraim. (2017). Most-cherished gemstones in the medieval Arab world. *Journal of the Royal Asiatic Society*, *27*(3), 377–401.

4   Adams, Noël. (2011). The garnet millennium: the role of seal stones in garnet studies. *Gems of Heaven: Recent Research on Engraved Gemstones in Late Antiquity, London: British Museum*, 10–24.
     Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums.

δε τον ηλιον τιθέμενων ἄνθρακος καιομενου ποιει χρόαν, τιμιώτατον δ* ὡς
ειπείν᾽ μικρόν γάρ σφόδρα τεττᾰράκοντα χρυσῶν, ἄγεται δε ούτος εκ Καρχη-
δόνος και Μασσαλίας. οὐ καίεται δὲ ὁ περί Μίλητον γωνιοειδής ὤν εν ᾧπερ και
τά εξάγωνα, καλοῦσι δ* ἄνθρακα και τούτον, ὃ και θαυμαστόν εστίν᾽ ομοιον γάρ
τρόπον τινά και το του αδάμαντος᾽

But there is another kind of stone which seems to be of an exactly oppo-
site nature, since it cannot be burnt. It is called *anthrax*, and seals are cut
from it; it is red in color, and when it is held towards the sun it has the color
of a burning coal. One might say that it has great value; for a very small
one costs forty pieces of gold. It is brought from Carthage and Massalia.
The stone found near Miletus does not burn; it is angular and there are
hexagonal shapes on it. It is also called *anthrax*, and this is remarkable,
for in a way the nature of *adamas* is similar ... [5]

The traditional etymology of χαλκηδών *chalkedon* (and thus Hebrew *kaḏkōḏ*) is
first found in Pliny, where it is derived from the toponym of Carthage (Greek
Καρχηδών *Karchedon*) in North Africa according to the dominant reading. If
χαλκηδών *chalkedon* is indeed derived from Carthage, then it would almost cer-
taly have been loaned directly into Hebrew from Phoenician, as Carthage was
a Phoenician city named *Qrt Ḥdšt.* But this name would not be rendered into
Hebrew as כַּדְכֹּד *kaḏkōḏ* if directly borrowed from Phoenician! Noonan provides
an additional reason:

The variant spellings in Greek and Latin seem to have led to an erro-
neous association of this gemstone with Carthage, adapted as Καρχηδών
in Greek and *Carthago* in Latin from the Phoenician name of the city,
קרת חדשת 'New City'. Pliny claims that the gemstone *carchedonia* comes
from North Africa (Nat. 37.30.104), but this is probably a mistake result-
ing from its apparent similarity to Gk Καρχηδών and Lat *Carthago*. Extant
manuscripts of Pliny preserve several different variants (*charcedonia, cal-
cedonia, calchedonia*, and *carchedonius*), some of which are more similar
to the ancient name for Chalcedon than to Carthage. It makes little sense
to think that the gemstone denoted by כַּדְכֹּד comes from Carthage because
Ezek 27:16 lists this gemstone as a product imported by Tyre from the
north.[6]

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5   Caley, Earle Radcliffe, and John FC Richards. *Theophrastus on stones: Introduction, Greek text,
    English translation, and commentary*. The Ohio State University Press, 1956.

6   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Lan-
    guage Contact* (Vol. 14). Penn State Press. Note 286.

Chalcedon (Greek Χαλκηδών *Chalkedon*), now Istanbul, fits χαλκηδών *chalkedon* more closely, but his etymology is predicated on identifying כַּדְכֹּד *kaḏkōḏ* with 'red jasper', because garnets are not found near Istanbul. One might look elsewhere for better harmony with the Greek data, rather than positing the meaning 'red jasper' for Greek χαλκηδών *chalkedon*, or arguing for Greek loanwords before they appear in the Bible. Noonan's archeogemological argument regarding the source of garnet may not withstand scrutiny, but his note about manuscript variation in Pliny is quite important.

There is a third toponym yet to be proposed as the origin of כַּדְכֹּד *kaḏkōḏ*, as far as I am aware. Caria, a region in Anatolia, was rendered in many ancient languages as *Kark-*, like in Hittite *Karkiya, Karkisa*,[7] Old Persian *Karka*,[8] Aramaic כרך *krk*.[9] Although a Carian inscription bearing its name has not yet been found, scholars may tentatively reconstruct the Carian endonym as **Karka* based on these borrowing. Greek Καρία *Karia* is missing the final velar consonant, but כַּדְכֹּד *kaḏkōḏ* and its cognates may have originated in Carian where the *-k-* is preserved, so this is no issue. The ancient garnet trade was centered in historical Caria, which lasted into medieval times. Pliny mentions[10] that these garnets originated in the Carian city of Orthosia (Ὀρθωσία), but were cut and polished at Alabanda, from which they get their name. That Theophrastus, writing in the 4th–3rd centuries BCE, describes garnets from Miletus (another ancient city in Caria), bolsters the ancient association of garnets and Caria.

By the Medieval period, the connection between Alabanda and garnet was so intertwined that the red garnets became known as almandine garnet ($Fe^{2+}_3Al_2Si_3O_{12}$). Almandine garnet is used to differentiate the original garnet ($Fe^{2+}_3Al_2Si_3O_{12}$) from other minerals classified within the garnet mineral-class, but gemologically, *garnet* without a modifier refers to almandine garnet. Garnets can be found in the Menderes Massif in the north of Aydın-Çine district, around the ancient city of Alabanda, in Caria.[11] The geology of Turkey is still poorly investigated, but Lüle-Whipp reports that "[i]n recent excavations the city walls of Alabanda were found to have been built with local migmatitic

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7   Adiego, Ignacio. (2006). *The Carian Language*. Brill.
8   Bachenheimer, Avi. (2018). *Old Persian: Dictionary, Glossary and Concordance*. John Wiley & Sons.
9   Teixidor, Javier. (1978). The Aramaic text in the trilingual stele from Xanthus. *Journal of Near Eastern Studies*, *37*(2), 181–185.
10 Pliny 37:25.
11 Çoban, Evrim, Cahit Helvaci, and Murat Hatipoğlu. (2014). Mineralogical and gemmological investigations on ancient gemstones in the Caria region (Muğla) and their relations with rocks and minerals outcropping in the region. In *Abstract Book of the 8th International Symposium on Eastern Mediterranean Geology* (pp. 13–17).

rocks containing red garnets, but large samples of garnet gems are not yet known in this area."[12] Unfortunately, little geological work has been done in this region to characterize and describe garnets.

If כַּדְכֹּד *kaḏkōḏ* does derive from an ancient Carian toponym like *Kark-*, the second element still requires explanation. Given that כַּדְכֹּד *kaḏkōḏ* is probably a borrowing from Carian, it is proper to look at Carian for an explanation. I suggest that this represents a Carian nominalizing suffix. Because so little vocabulary of Carian is known, one must resort to a combination of comparison with other Anatolian languages with wild speculation. The Proto-Anatolian storm god **tr̥Hʷánts* (from PIE **tr̥h₂w-ónt-s*) is realized in Hittite as *Tarḫunna, Tarḫuna/i*, Luwian *Tarḫunt-*, Milyan *Trqqñt-*, Lycian *Trqqas* (A), *Trqqiz* (B), and Carian as *Trq(u)δ-*.[13] Thus it appears that the PIE derivational suffix **-onts* was realized as *-(u)δ* in Carian, pronounced something like /(u)ⁿd/ (although the exact phonological realization of *-δ* is still not completely established).

Putting the Carian endonym **Kark-* and the Carrian derivational suffix *-(u)δ* together would create a Carian word of the form **karkuδ* /karkuⁿd/ 'garnet'. An anonymous Wiktionary entry on the Arabic cognate كَرْكَنْد *karkand* develops an etymology that asserts an unattested Hittite donor.[14] Such an origin, although doubtful in Hittite per se, is neither phylogenetically nor geographically distant from the Carian origin that I reconstruct. Once Anatolian speakers innovated a word for garnet, it would have been donated to languages across the ancient Mediterranean with the expansion of the garnet trade in the first millennium BCE. Thus כַּדְכֹּד *kaḏkōḏ* most likely referred to garnet, as did Greek χαλκηδών *chalkedon*.

2 אֶקְדָּח *ʾeḳdāḥ*

Whereas כַּדְכֹּד *kaḏkōḏ* is an Indo-European loanword, אֶקְדָּח *ʾeḳdāḥ* appears to be of Semitic stock. This word is a *hapax* in Isaiah 54:12, paralleled to כַּדְכֹּד *kaḏkōḏ* 'garnet'.

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12   Lüle-Whipp, C. (2006.) *Mineralogical-petrological and geochemical investigation on some garnets from volcanic rocks of Gorece Village-Cumaovasi, Izmir and metamorphites of Menderes Massif and their possible archaeogemological connections.* Ph.D. thesis, Hacettepe University, Ankara, Turkey.

13   Adiego, Ignacio. (2006). *The Carian Language.* Brill. 331–332.

14   Wiktionary.org/wiki/كَرْكَنْد.
      https://web.archive.org/web/20210129234509/https://en.wiktionary.org/wiki/%D9%83%D8%B1%D9%83%D9%86%D8%AF.

וְשַׂמְתִּי כַּדְכֹד שִׁמְשֹׁתַיִךְ וּשְׁעָרַיִךְ לְאַבְנֵי אֶקְדָּח וְכָל־גְּבוּלֵךְ לְאַבְנֵי־חֵפֶץ

> I will make your battlements of *kaḏkōḏ*, your gates of *eḵdāḥ*, The whole
> encircling wall of gems.

The parallelism between כַּדְכֹד *kaḏkōḏ* and אֶקְדָּח *eḵdāḥ* in Isaiah 54:12 perhaps
indicates a semantic equivalence. They could be different precious stones, but
etymological considerations point to a secondary word for garnet, as will be
demonstrated. The only cognate previously suggested for אֶקְדָּח *eḵdāḥ* is Arabic
قَدَّاحَة *qaddāḥa*, قَدَّاح *qaddāḥ* 'flint', which is semantically unsuitable. Context
indicates that אֶקְדָּח *eḵdāḥ* is a precious stone, whereas flint is solely a func-
tional stone. There does not seem to be any way to evolve semantically from
flint to *garnet* or vice-versa.

   Although אֶקְדָּח lacks any obvious cognates in other languages, it is a mem-
ber of a complex of ancient Mediterranean words for garnet, calqued from the
idea of *glowing coals*. Whereas charcoal is not notable at room temperature,
when glowing red-hot charcoal has a very distinctive glowing red-orange color,
resembling garnet in sunlight.

3   Greek Ἄνθραξ *Anthrax* and Latin *Carbunculus*

The Greek word ἄνθραξ *anthrax* primarily refers to a charcoal, but also refers
separately to garnet. Latin *carbunculus* is a diminutive of Latin *carbo* 'charcoal,
coal', and also refers specifically to garnet. The word for garnet in both of these
languages derives from a parallel semantic development, an extension of the
word for a glowing charcoal. This association was present in Semitic languages
as well.

4   Ugaritic *Pḥm* and Akkadian *Pēndû*

Ugaritic *pḥm* and Akkadian *pēndû* refer to precious stones that have remained
previously unidentified. Although *pḥm* is often interpreted as a color, it is actu-
ally a type of precious stone,[15] sometimes used to describe a color via abstrac-
tion. Knoppers lists of a number of instances where *pḥm* designates wool equiv-

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15   Knoppers, Gary N. (1993). Treaty, Tribute List, or Diplomatic Letter: KTU 3.1 Reexamined.
      Bulletin of the American Schools of Oriental Research, *289*(1), 81–94.

alent to Akkadian ḫašmānu (now identified as *amethyst*[16]). The use of precious stones to describe the colors of dyed wool was the norm in the second millennium BCE, most well-known from Akkadian examples.[17] Even though *pḥm*-wool = ḫašmānu-wool, that does not indicate that *pḥm* and ḫašmānu are necessarily exactly the same gemstone. Rather, Ugaritic and Akkadian may have innovated these names for wool colors independently. Whereas ḫašmānu 'amethyst' is purple, it is prudent to consider the identity of *pḥm* with amethyst more loosely.

Garnets and amethyst may easily have been confused in antiquity. Despite the fact that garnets are archetypically dark red, they also occur in colors closer to purple. As similarly colored transparent stones, garnets and amethysts would be easily confused. Beyond the visual similarity, amethyst and garnet were found in the same Middle Kingdom mine in Egypt.[18] Though this mine was not the only source of garnets in the ancient world, the shared source of two highly similar stones would provide an opportune source of confusion for the non-expert tradesman.

There is good reason to believe that Ugaritic *pḥm* means 'garnet' and not 'amethyst'. Ugaritic *pḥm* must be compared with Hebrew פֶּחָם *peḥām*, Syriac ܦܚܡܐ *paḥmā*, Arabic فَحْم *faḥm*, Ethiopic *feḥm*, and Akkadian *pēntu*, all of which refer to a glowing-red charcoal (and originating with Proto-Semitic **paḥm-* 'charcoal'). The context of Ugaritic *pḥm* as a gift with other precious stones rules out charcoal proper. But contextualized with Greek ἄνθραξ *anthrax* and Latin *carbunculus*, Ugaritic *pḥm* may be identified with garnet. No other Ugaritic word for garnet has yet been identified.

Akkadian *pendû* (*pindû*) is morphologically similar to Ugaritic *pḥm*, and like its doppelganger in the west, Akkadian *pendû* (*pindû*) was used to designate an obscure precious stone. Context makes it clear that *pendû* was a red precious stone,[19] entirely explicable if identified with garnet. Although the orthography doesn't indicate this directly, etymological considerations suggest that the first vowel should be long (*pēndû*). The various forms extant throughout the life of Akkadian demonstrate that *pendû* was derived from *pēntu* (*pēndu, pēmtu, peʾittu*) 'charcoal, embers' with the nisbe suffix **-āy* (reflected in the long

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16 Black, Jeremy. (2001). Amethysts. *Iraq, 63*, 183–186.

17 Thavapalan, Shiyanthi. (2019). *The Meaning of Color in Ancient Mesopotamia*. Brill.

18 Harrell, James A. (2023). *Archaeology and Geology of Ancient Egyptian Stones*. Archaeopress.

19 Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *pendû*.

final vowel)[20] to generate the meaning 'charcoal-like'. Three additional changes occurred to create the various forms extant in Akkadian; voicing of $t > d$ on influence of /m/, backing of $m > n$ on influence of /t/, and assimilation of -nt- to -tt-.

Like Ugaritic *paḥm*, Akkadian *pēmtu* also derives from PS **paḥm-* 'charcoal' on analogy of the other Semitic forms. The feminine suffix *-t* probably functioned in this word to differentiate *pēmtu* 'charcoal, ember' from *pēmu* 'thigh', thus the double-marking of the feminine in *pendû* 'garnet'. Alongside PS **paḥm-* 'charcoal', I would reconstruct the derivative term PS **paḥm-(at)-āy* 'garnet'. Arabic offers a potential candidate for this stem. The Arabic paradigm *ʔafʕal-* forms color adjectives of the shape *ʁaẓ-āʔ-u* in the feminine, which reconstructs to Proto-Semitic **ʁaẓ-āy-u*.[21] Thus **paḥm-āy-* may be reconstructed as ancestral of Ugaritic *paḥm* and Akkadian *pendû* (with the addition of *-at* in the latter).

5   Historiography

The exegetical history of אֶקְדָּח *ʾeḵdāḥ* is particularly remarkable. One school of thought reinterpreted the root of אֶקְדָּח *ʾeḵdāḥ* to be Aramaic ק-ד-ח *ḳ-d-ḥ* 'to drill'. Pearls, as bored "stones", provided a perfect subject for exegesis. Early biblical commentators reified this verse via *derasha* to refer to the "pearly gates of Jerusalem" under the influence of this new etymology.[22] This than allows us to explain the esoteric midrash in Bava Bathra 75a:

וּשְׁעָרַיִךְ לְאַבְנֵי אֶקְדָּח כִּי הָא דְּיָתֵיב רַבִּי יוֹחָנָן וְקָא דָּרֵישׁ עָתִיד הַקָּדוֹשׁ בָּרוּךְ הוּא לְהָבִיא אֲבָנִים טוֹבוֹת וּמַרְגָּלִיּוֹת שֶׁהֵם שְׁלֹשִׁים עַל שְׁלֹשִׁים וְחוֹקֵק בָּהֶן עֶשֶׂר עַל עֶשְׂרִים וּמַעֲמִידָן בְּשַׁעֲרֵי יְרוּשָׁלַיִם לְגִלֵּג עָלָיו אוֹתוֹ תַּלְמִיד הַשָּׁתָּא כְּבֵיעֲתָא דְצִיצְלָא לָא מַשְׁכְּחִינַן כּוּלֵּי הַאי מַשְׁכְּחִינַן לְיָמִים הִפְלִיגָה סְפִינָתוֹ בַּיָּם חֲזָא מַלְאֲכֵי הַשָּׁרֵת דְּיָתְבִי וְקָא מְנַסְּרִי אֲבָנִים טוֹבוֹת וּמַרְגָּלִיּוֹת שֶׁהֵם שְׁלֹשִׁים עַל שְׁלֹשִׁים וְחָקוּק בָּהֶן עֶשֶׂר בְּרוּם עֶשְׂרִים אֲמַר לְהוּ הָנֵי לְמַאן אֲמַרוּ לֵיהּ שֶׁעָתִיד הַקָּדוֹשׁ בָּרוּךְ הוּא לְהַעֲמִידָן בְּשַׁעֲרֵי יְרוּשָׁלַיִם אֲתָא לְקַמֵּיהּ דְּרַבִּי יוֹחָנָן אֲמַר לֵיהּ דְּרוֹשׁ רַבִּי לְךָ נָאֶה לִדְרוֹשׁ כַּאֲשֶׁר אָמַרְתָּ כֵּן רָאִיתִי אֲמַר לוֹ רֵיקָא אִלְמָלֵא לֹא רָאִיתָ לֹא הֶאֱמַנְתָּ מְלַגְלֵג עַל דִּבְרֵי חֲכָמִים אַתָּה נָתַן עֵינָיו בּוֹ וְנַעֲשָׂה גַּל שֶׁל עֲצָמוֹת

20   Kogan, Leonid. & Krebernik, Manfred. (2020). *Etymological Dictionary of Akkadian. Volume 1 Roots beginning with p and b*. Berlin, Boston: De Gruyter. 105–106.

21   Van Putten, Marijn. (2018). The feminine endings *-ay and *-āy in Semitic and Berber. *Bulletin of the School of Oriental and African Studies*, 81(2), 205–225.

22   Fekkes, Jan. (1990). "His Bride Has Prepared Herself": Revelation 19–21 and Isaian Nuptial Imagery. *Journal of Biblical Literature*, 109(2), 269–287.
       Slifkin, Natan. (2008). Messianic Wonders and Skeptical Rationalists. *Hakirah, 6*, 197–221.

The esoteric reading of rabbinic texts is not an art familiar to most readers,[23] so I will offer an explanation of this passage in leu of a literal translation. Rabbi Yoḥanan was expounding Isaiah 54:12, and created an association between אֶקְדָּח ʾeḳdāḥ and the Aramaic ק-ד-ח ḳ-d-ḥ 'to drill'. A student rejected this exegesis because he did not understand the association between the Aramaic ק-ד-ח ḳ-d-ḥ 'to drill' and אֶקְדָּח ʾeḳdāḥ. Later, as the student was delving into "the sea of Tora", he finally understood his teacher's exposition. He returned to his teacher, who interjects "ignoramus (רֵיקָא)"! Rabbi Yoḥanan rebuffs his student for rejecting his exposition when he didn't understand. The student is humbled.

It so happens that the original meaning of אֶקְדָּח ʾeḳdāḥ was preserved by the Jews, as אֶקְדָּח ʾeḳdāḥ was translated גְּמַר gəmar in the Aramaic Targum to Isaiah. Rabbi Shəlomo Yiṣḥaḳi points out in his commentary to Isaiah 54:12 that גומרין gwmryn is the Aramaic translation of Hebrew גֶּחָלִים geḥālīm 'coals' in the targums. The conceptual source in coal for this Aramaic word for garnet is semantically equivalent to the Old French reflex of Latin carbunculus, also originally meaning "little coal". At least within the worldview of the targumist, אֶקְדָּח ʾeḳdāḥ was semantically equivalent to carbunculus. But the semantic connection between hot coal = garnet isn't limited to Latin, it is evident in Greek ἄνθραξ anthrax, Ugaritic pḥm and Akkadian pēndû. The association between hot coal = garnet must include אֶקְדָּח ʾeḳdāḥ as well.

Establishing the meaning of אֶקְדָּח ʾeḳdāḥ is easier than establishing the etymology. The root of אֶקְדָּח ʾeḳdāḥ is ק-ד-ח ḳ-d-ḥ 'to kindle, be kindled', not the homophonous root ק-ד-ח ḳ-d-ḥ 'to drill'. But the stem is a serious issue. Because a nominal stem of the shape *ʔe12ā3 is not productive in Hebrew, אֶקְדָּח ʾeḳdāḥ must be an inter-Semitic borrowing. I suggest that ʔe12ā3 represents *ʔi12ā3, a qtal with a prosthetic vowel -אֶ (i-qtal). *ʔi12ā3 is equivalent to the Hebrew stem ʔe12ō3 in a language which did not undergo the Canaanite Shift. This provides further evidence against a relationship with Arabic قَدَّاحَة qaddāḥa, قَدَّاح qaddāḥ 'flint', which has an incompatible stem.

Because אֶקְדָּח ʾeḳdāḥ is unattested in any other language, it is difficult to identify the language of origin. A consideration of the geography of the Lev-

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23   For readers of an academic background, the best introduction to esoteric writing would be the work of Leo Strauss (see "On a Forgotten Kind of Writing" for a brief introduction and "Persecution and the Art of Writing" for a more detailed description [Bibliography]). However, Strauss' axioms are irreconcilable with the rabbinic worldview, and I recommend his work on esoteric writing only to rebut the common academic misconception which presumes all texts to be read literally. But contra Strauss, to correctly interpret esoteric rabbinic texts requires years to decades of immersion in the rabbinic intellectual lifestyle. For readers with a yeshiva background, see the writings of Ḥakham José Faur [Bibliography].

ant is particularly helpful in this regard. Garnet originates in Western Anatolia, which must have been transported by sea or through central Anatolia, into Syria and then Lebanon. Notably, that implies garnet must have traveled through Amorite territory. While little is known of Amorite nominal patterns, Amorite did not undergo the Canaanite Shift, so it matches the description above. An Amorite origin remains, however, speculative.

In Egypt, garnet was quite rare until the Ptolomaic period,[24] which correlates with the absence of garnet in biblical texts set prior to the eighth-century BCE. This may suggest that this stone was unavailable in Ancient Israel (or at least, unpopular) until the first millennium BCE. The primary source for these garnets was evidently Anatolia, but the geological source is unconfirmed. Hebrew appears to have had at least two words for 'garnet'—כַּדְכֹּד *kaḏkōḏ* and אֶקְדָּח *eḵdāḥ*. Considering the likely Anatolian origins of garnet, an Carian origin for כַּדְכֹּד *kaḏkōḏ* is likely. A conceptual family of ancient Mediterranean words for garnet derived from the idea of a (glowing) coal has been identified. A north Semitic etymology for אֶקְדָּח *eḵdāḥ* is probably the best explanation of the origin of this term given the difficult stem. Finally, a Proto-Semitic word **paḥm-āy* 'garnet' may be reconstructed based on Ugaritic *pḥm* and Akkadian *pēndû*.

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24   Harrell, James A. (2012). Gemstones. UCLA *Encyclopedia of Egyptology*, *1*(1).

צֹר *Ṣōr* & חַלָּמִישׁ *Ḥallāmīš*—Flint/Obsidian

There are two words generally associated with flint in the Hebrew Bible: חַלָּמִישׁ *ḥallāmīš* and צֹר *ṣōr*. The meanings of these words are not necessarily limited to flint, as obsidian is also extensively documented in Levantine lithics and overlapping meaning between flint and obsidian is also present in cognates. Flint is a cryptocrystalline quartz (SiO_2) occurring in chalk or limestone. It is endemic in the chalky hills of central Israel, primarily used historically to make stone tools, most notably blades and points, and for starting fires. While chemically identical (also SiO_2), obsidian is a natural volcanic glass which is far more brittle than flint, which is absent from Israel's geology. To appreciate the meanings of חַלָּמִישׁ *ḥallāmīš* and צֹר *ṣōr* requires a prehistoric perspective on the use of flint and obsidian.

Flint is endemic in the Levant, and was extensively exploited for arrowheads and blades of Levantine cultures dating back to the Paleolithic.[1] Prior to the mass-exploitation of iron during the Iron Age (first millennium BCE in the Levant), metal was too expensive for widespread use in tools or hunting/war implements. Even during the Bronze Age, stone blades were still being manufactured and used.[2] Despite the ubiquity and utility of flint, obsidian was also used during the Chalcolithic, imported from Cappadocia in Anatolia and the Lake Van region.[3]

1 צֹר *Ṣōr*

The inherited word for flint in Classical Hebrew is צֹר *ṣōr*. צֹר *ṣōr* should be considered separately from Classical Hebrew צוּר *ṣūr* 'rock, cliff, boulder, support,

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1 Shea, John J. (1988). Spear points from the Middle Paleolithic of the Levant. *Journal of Field Archaeology, 15*(4), 441–450.

2 Manclossi, F., Rosen, S.A., & Boëda, E. (2019). From stone to metal: The dynamics of technological change in the decline of chipped stone tool production. A case study from the southern Levant (5th–1st Millennia BCE). *Journal of Archaeological Method and Theory, 26*(4), 1276–1326.

3 Carter, Tristan, Kathryn Campeau, & Katharina Streit. (2020). Transregional Perspectives: Characterizing Obsidian Consumption at Early Chalcolithic Ein el-Jarba (N. Israel). *Journal of Field Archaeology, 45*(4), 249–269.

TABLE 4 Comparison of Semitic lemma from *ṭ-r-r

Underlying form	Reflexes					
	Hebrew	**Akkadian**	**Aramaic**	**Arabic**	**OSA**	**Ugaritic**
*ṭurr- 'flint'	צֹר ṣōr 'flint'	𒍪 ṣurru 'flint, obsidian, rock crystal'	טינּרא ṭīnnārā 'pebble' ܛܪܢܐ ṭarrānā flint, rock	ظِرّ ẓirr "flint"		ẓr
*ṭūr- 'mountain'	צוּר ṣûr "rock"	ṣûru	טור ṭûr "mountain"		ẓr, ẓwr 'rock, mountain'	𒄴 ġr "mountain"
*ṭirār- 'pebble'	צְרוֹר ṣərōr 'pebble'			ظُرَر ẓirār 'sharp stone'		

Inter-Semitic borrowings[4] have been excluded. Also compare Amorite ṣúru found in personal names, of ambiguous meaning.[5] 'Flint' would be a strange element for a personal name, whereas 'mountain' is attested in other languages. Compare this element in Amorite names to Hebrew names like אֱלִיצוּר *Elitzur* 'God is my bedrock'.

defense, fortress, place of refuge',[6] best observed by the difference in vowel, which suggests separate proto-forms *ṭūr- > צוּר ṣûr versus *ṭurr- > צֹר ṣōr.

The consensus among Semiticists is that *ṭūr- represents a West Semitic development from *ṭurr-, but this is developmentally implausible from a semantic perspective. Because the mountains of the Levant are hardly composed of flint or obsidian, flint is not a natural subject to use as the etymon for 'mountain'. Agmon viewed these terms as parallels in Proto-Semitic, his theory is more

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4 Hopkins, Simon. (1995). Ṣarār "pebbles"—A Canaanite Substrate Word in Palestinian Arabic. *Zeitschrift für arabische Linguistik*, (30), 37–49.

5 Gray, Taylor. (2019). Translating ṣúru in Amorite Personal Names. *N.A.B.U. 2019 n° 3 (septembre)*. 108–109.

6 Irvine, S.A. (2019). The 'Rock' of the King's Sword? A Note on צוּר in Psalm 89:44. *Vetus Testamentum*, 69(4–5), 742–747.

plausible.[7] Perhaps *ṭūr-* and *ṭurr-* were simply byforms in pre-Proto-Semitic that underwent semantic dissimilation in Proto-Semitic, becoming differentiated to 'mountain' and 'flint' respectively. It would certainly be surprising if *ṭūr-* wasn't a particularly ancient word for mountain, given its incredible polyphony in Hebrew.

Regardless of the situation for *ṭūr-* and *ṭurr-* in Proto-Semitic, a West Semitic word from the same root, *ṭirār-* 'pebble', should be reconstructed. While the evidence for this word is limited to Central Semitic (Hebrew צְרוֹר *çərōr* 'pebble' and the marginal Classical Arabic form ظِرَار *ẓirār* 'sharp stone'[8]), this pattern is not productive in Hebrew,[9] pointing towards an earlier source. The relationship between PS *ṭurr-* 'flint' and CS *ṭirār-* 'pebble' can be explained by recourse to archeology. The Ghassulian culture of the Chalcolithic Levant, coincides with the geography and time in which Proto-Semitic is hypothesized to have been spoken.[10] Within the Ghassulian culture, flint blades were made by splitting flint pebbles into sections, which would then be worked into individual blades.[11] The obsolescence of *ṭirār-* in reflex languages may be a consequence of the increasing popularity of bronze and iron implements over time.

1.1 צֹר Ṣōr as 'Rock Crystal'?

Ezekiel 3:9 employs צֹר *ṣōr* in a context which is problematic if it is assumed that צֹר *ṣōr* is limited to obsidian or flint:

כְּשָׁמִיר חָזָק מִצֹּר נָתַתִּי מִצְחֶךָ לֹא־תִירָא אוֹתָם וְלֹא־תֵחַת מִפְּנֵיהֶם כִּי בֵּית־מְרִי הֵמָּה:

Like corundum, harder than *ṣōr*, I will make your forehead. Do not fear them, and do not be dismayed by them, though they are a rebellious breed.

7   Agmon, N. (2010). Materials and language: Pre-Semitic root structure change concomitant with transition to agriculture. *Brill's Journal of Afroasiatic Languages and Linguistics*, *2*(1), 23–79.

8   Lane, Edward William. (1872). *Arabic-English Lexicon*. Islamic Book Centre.

9   Fox, Joshua. (2003). *Semitic noun patterns*. Brill. 229.

10 Kitchen, Andrew, Ehret, Christopher, Assefa, Shiferaw, & Mulligan, Connie J. (2009). Bayesian phylogenetic analysis of Semitic languages identifies an Early Bronze Age origin of Semitic in the Near East. *Proceedings of the Royal Society B: Biological Sciences*, *276*(1668), 2703–2710.

11 Gilead, Isaac, Davidzon, Angla, & Vardi, Jacob. (2006, September). The Ghassulian sickle blades workshop of Beit Eshel, Beer Sheva, Israel. In *Lithic Technology in Metal Using Societies. Proceedings of a UISPP Workshop, Lisbon* (pp. 221–230).

Both flint and obsidian are improper to compare to the hardness of corundum, as flint and obsidian are easily chipped. A helpful connection may be made to Akkadian, where the cognate term *ṣurru* 'flint, obsidian' included rock crystal. Rock crystal is a confusing term in English, it should probably apply to opaque, colorless quartz (SiO_2) in a massive formation. Rock crystal differs from crystal quartz in its opacity and massivity, whereas crystal quartz forms faceted crystals that are transparent if not obscured by inclusions. A small vessel carved from rock-crystal, auctioned off by Sotheby's in Monaco in 1987.[12] The object dates from the early second millennium BCE, and bears a Sumerian inscription. This inscription described the vessel it is inscribed on as composed of [NA4]*zú-gi₆*, semantically equivalent to Akkadian *ṣurru*.[13] To quote CAD on *ṣurru*:

> Since flint and obsidian (chemically and geologically quite different) are denoted by the same word (see also *ṣurtu*), it is possible that the translucence of the obsidian determined its value and that even rock crystal (on account of its translucence) was called *ṣurru*.

Rock crystal is a much better contrast to emery (שָׁמִיר *šāmīr*) then flint or obsidian. It must therefore be interpolated that צֹר *ṣōr* included 'rock crystal' as a secondary meaning. However, rock crystal is absent from Ghassulian blades or points. The addition of 'rock crystal' to Akkadian *ṣurru* appears to be a very particular Akkadian development. Unlike in Canaan, rock crystal was available in Mesopotamia, where it was knapped into arrowheads from the third millennium BCE and used to carve objects like the aforementioned bowl.[14] It is from the utility in making points that rock crystal would be categorized with flint and obsidian under the word *ṣurru*. Given the Babylonian context of Ezekiel, and the assortment of Akkadian influences therein,[15] the meaning 'rock crystal' for צֹר *ṣōr* is probably due to contact with Akkadian *ṣurru* rather than shared inheritance from Proto-Semitic. The regular term for 'rock crystal' in Classical Hebrew was גָּבִישׁ *gāḇīš*, refer to Chapter 16 for more detail.

12   de Béhague, Martine Marie Pol. "Antiquités et objets d'art: collection de Martine, Comtesse de Béhague, provenant de la succession du Marquis de Ganay; Sotheby, Monaco: 5.12.1987." (1987). 42–43.

13   Frayne, Douglas. *Old Babylonian Period* (2003–1595 BC). Vol. 4. University of Toronto Press, 1990. Pages 305–306. Entry 2004.

14   Moorey, Peter Roger Stuart. (1999). *Ancient Mesopotamian materials and industries: the archaeological evidence*. Eisenbrauns. 71.

15   Bodi, Daniel. (2020). "The Mesopotamian Context of Ezekiel". In *Ezekiel*, ed. Corrine Carvalho. Oxford University Press. Online pre-publication.

2 חַלָּמִישׁ Ḥallāmīš

Given that צֹר ṣōr is inherited from Proto-Semitic meaning 'flint, obsidian', חַלָּמִישׁ ḥallāmīš must somehow differ in source or meaning. And indeed, חַלָּמִישׁ ḥallāmīš is used a poetic word for 'flint' relative to צֹר ṣōr, which is more typical for prose. In addition, there are two morphological features that also mark חַלָּמִישׁ ḥallāmīš as non-Semitic. Semitic nouns are generally triconsonantal or biconsonantally doubled (and perhaps affixed), חַלָּמִישׁ ḥallāmīš has four consonants. While this is not definitive for marking a loanword, it is still symptomatic. More definitive is that חַלָּמִישׁ ḥallāmīš possesses a particularly unusual construct form חַלְמִישׁ ḥalmīš, which loses gemination in the second radical. Considering חַלָּמִישׁ ḥallāmīš appears to be borrowed from a non-Semitic language, determining the language of origin may help reveal the history and particular connotations of this word.

Several cognates have been proposed for חַלָּמִישׁ ḥallāmīš, ranging from *elmēšu* in Old Babylonian Akkadian to Greek ἀδάμας *adamas*, in Homer and beyond.

2.1 *Arabic*
Perhaps because Arabic خَلَنْبوس *ḫalnabūs* 'flint' is so remarkably obscure, it has been missed in nearly every treatment of חַלָּמִישׁ ḥallāmīš. It is clearly a cognate, preserving the sequence *-ln-* which assimilated to *-ll-* in the other Semitic cognates (in accordance with the pattern of *n*-assimilation in North Semitic[16]). The realization of the sibilant as /s/ where Hebrew and Akkadian have /š/ indicates that خَلَنْبوس *ḫalnabūs* is an old form.

2.2 *Greek*
Greek ἀδάμας *adamas* covered a range of hard stones over the history of its usage. The first attestation of Greek ἀδάμας *adamas* is in the poetry of Hesiod, where it is traditionally (mis)interpreted as 'steel'. Contextually, ἀδάμας *adamas* is a material for weapons during the era of the Trojan War,[17] and the material of the sickle used by Kronos to castrate his father Uranus.[18] Hesiod describes ἀδάμας *adamas* as χλωρός *chloros* 'yellow-green' and πολιός *polios* 'gray'; not a description of iron or steel. However, flint comes in a range of possible col-

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16   Southern, Mark, & Vaughn, Andrew G. (1997). Where have all the nasals gone? *n*C > CC in North Semitic. *Journal of Semitic Studies*, 42(2), 263–282.

17   Hes. Sh. 231.

18   Hes. Th. 161.

ors, of which yellow-green and gray would both be suitable descriptors. Thus, it appears that 'flint' is the most plausible translation for the earliest usage of Greek ἀδάμας *adamas*.

By the time of Theophrastus,[19] Greek ἀδάμας *adamas* had shifted to refer to a sort of hard and hexagonal mineral. In Pliny, ἀδάμας *adamas* clearly refers to colorless corundum (white sapphire) and more famously, diamond.[20] Although Greek ἀδάμας *adamas* is often derived from ἀ- *a-* 'not' + δαμνάω *damnao* 'conquer' meaning 'indomitable', Beekes notes[21] that this is semantically strange and rather argues that ἀδάμας *adamas* was a borrowing from Semitic. Which Semitic word ἀδάμας *adamas* was supposedly borrowed from, he declines to say.

2.3   *Akkadian*

In most previous literature, Akkadian *elmēšu* '(a stone)' is incorrectly connected with Hebrew חַשְׁמַל *ḥašmal*. Hebrew חַשְׁמַל *ḥašmal* should rather be connected with Egyptian *ḥzmn* 'arsenical copper', as I will demonstrate in a forthcoming paper.[22] Etymologically, Akkadian *elmēšu* and Hebrew חַשְׁמַל *ḥašmal* are a poor match because the /l/ ~ /š/ interchange is phonologically unlikely, especially given the proximity of /m/, which is more similar to /l/. The connection between the two words is based on some alleged "quasi-mythical" properties of Akkadian *elmēšu*,[23] which supposedly fits the usage of חַשְׁמַל *ḥašmal* in Ezekiel. The wondrous qualities of *elmēšu* should actually be explained by the incredible properties of flint; the ease of knapping into a blade, and its utility in starting fire.[24] The connection between *elmēšu* and חַשְׁמַל *ḥašmal* must be abandoned.

Instead, Akkadian *elmēšu* should be connected with Hebrew חַלָּמִישׁ *ḥallāmīš*. Akkadian *elmēšu* has several variants, the most notable of which is *ellimešu*, which preserves gemination of the /l/. CAD[25] records four forms:

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19   Theophrastus, Caley, E.R., & Richards, J.F. (1956). *Theophrastus on stones: Introduction, Greek text, English translation, and commentary*. The Ohio State University Press. §19.

20   Thoresen, Lisbet. (2017). Archaeogemmology and ancient literary sources on gems and their origins. In *Gemstones in the First Millennium AD. Mines, trade, workshops and symbolism*. Maguncia, Verlag des Römisch-Germanischen Zentralmuseums. 190–193.

21   Beekes, Robert. (2009). *Etymological dictionary of Greek* (2 *vols.*). Brill. 19.

22   Forthcoming.

23   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. 4 E. Entry: *elmešu*.

24   Landsberger, Benno. (1967). Akkadisch-Hebräische Wortgleichungen. In *Hebräische Wortforschung* (pp. 176–204). Brill.

25   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. 4 E. Entry: *elmešu*.

elmēšu, ellimēšu, ilmēšu, elmēštu. The feminine form *elmeštu* occurs only in proper names and reflects the usual feminine suffix.

2.4 *Ultimate Source*

The polymorphisms in Akkadian, Arabic خَلْنَبوس *ḥalnabūs*, and the difference between the absolute and construct form in Hebrew allows the reconstruction of a triconsonantal cluster *-lnm-. Based these cognates, the original word can be reconstructed as *ḥalnmūs. The penta-consonantal structure of this word and the triconsonantal structure and phonological non-correspondence makes it clear that this word is a loanword from outside Semitic.

Noonan's suggestion[26] that חַלָּמִישׁ *ḥallāmīš* derives from the supposed "Sinaitic" language is strained by the fact that there is no such 'Sinaitic' language. He is compelled to propose this source because חַלָּמִישׁ *ḥallāmīš* is associated with the Sinai desert (especially the Exodus wanderings) and because חַלָּמִישׁ *ḥallāmīš* supposedly lacks cognates outside of Arabic. As I demonstrated above, this term is well attested in Akkadian, so the association with the Sinai does not indicate that the term was exclusive to that area. Noonan's suggestion does, however, have merit. This word is associated with the Sinai desert. The Sinai was associated with Egypt through the early New Kingdom. Antecedents should be sought in Egyptian.

In the Semitic reflexes of this word, the first phoneme is unusually variable, even for loanwords: Arabic خ /x/ and أ /ʔ/, Hebrew ח (/ħ/ or /χ/), Akkadian Ø. The next two consonants in this sequence are -ln- as demonstrated by the Arabic reflex خَلْنَبوس *ḥalnabūs*. This odd sequence of consonants suggests the ancient Egyptian word *ȝnr* 'stone'. The phonetic value of Egyptian ⟨ȝ⟩ evolved through the history of the language. In New Kingdom Egyptian, it was a glottal stop, but it is reconstructed by many scholars as [ʁ] in the Middle Kingdom. With this understanding, the evolving nature of the ⟨ȝ⟩ phoneme is able to account for the discrepancy in the Semitic forms. The cluster -ln- is a perfectly reasonable reflex of -nr-. The grapheme transliterated as ⟨r⟩ was pronounced as /l/ in the standard dialect of Egyptian, and thus enters Hebrew as a *lamedh*. Furthermore, metathesis of liquid consonants is common in Semitic, so *-nl- > *-ln- is a perfectly reasonable development. Therefore, I believe Ancient Egyptian *ȝnr* may be the first element in חַלָּמִישׁ *ḥallāmīš*, reconstructed as *χanl-.

But if the first element in חַלָּמִישׁ *ḥallāmīš* is *ȝnr* 'stone' then the second element must be a word meaning 'flint'. The standard Ancient Egyptian word for

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26   Noonan, Benjamin. J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press. Pages 100–101.

flint is *ds*, which certainly cannot become *-mīš*. The second element may be the *hapax* word *bšw*, interpreted by Harris[27] as a type of flint. The word *bšw* occurs only in an 18th Dynasty spell[28] which describes a seraph as *m ds wbḫ n bšw* "of sparkling (*wbḫ*), sparking (*bšw*) flint". Previous interpreters attempted to interpret *wbḫ* and *bšw* in terms of a snake's actions.[29]

As a comparison with this 18th Dynasty spell, I would draw the reader's attention to an enigmatic verse. Deuteronomy 8:15 makes an association between חַלָּמִיש *ḥallāmīš* and the *seraphim* (שְׂרָפִים *śərāp̄īm*), flying fiery divine serpents. Here, the wilderness is described with its snakes *seraphim*, scorpions, and flint stone (צוּר הַחַלָּמִיש *çūr haḥallāmīš*) from which water was produced:

הַמּוֹלִיכְךָ֣ בַּמִּדְבָּ֣ר ׀ הַגָּדֹ֣ל וְהַנּוֹרָ֗א נָחָ֤שׁ ׀ שָׂרָף֙ וְעַקְרָ֔ב וְצִמָּא֖וֹן אֲשֶׁ֣ר אֵֽין־מָ֑יִם הַמּוֹצִ֤יא לְךָ֙
מַ֔יִם מִצּ֖וּר הַֽחַלָּמִֽישׁ׃

Who led you through the great and terrible wilderness, serpent, seraph, and scorpion, a parched land with no water in it, who brought forth water for you from the rock of flint.

This lends credence to association of *bšw* with חַלָּמִיש *ḥallāmīš* by demonstrating familiarity between חַלָּמִיש *ḥallāmīš* and the seraph cultural motif. I propose a novel interpretation of *m ds wbḫ n bšw*, not in terms of a snake's actions, but by the properties of flint and association with the uraeus. When struck to create fire, flint produces bright sparks, which may be used to ignite tinder. Sparking flint may be separated into two phenomena—the production of bright sparks and the creation of fire. Thus *wbḫ* (which usually means "bright, sparkling") should be interpreted as the sparkling appearance of stuck flint, and *bšw* the fire-starting ability. As *bšw* here is written with the stone determinative, the phrase *ꜣnr bšw* may be a poetic epithet of flint, which compliments the poetic usage of חַלָּמִיש *ḥallāmīš* in Hebrew. Although the specific phrase *ꜣnr bšw* is only attested in this text, the concept of flint as fire-starting is present at all stages of written Egyptian.[30]

27   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin.

28   Spell 108 of the 18th Dynasty Papyrus of Nu, British Museum EA10477

29   Graves-Brown, Carolyn Anne. (2011). *The ideological significance of flint in Dynastic Egypt* (Doctoral dissertation, University College London). Pages 230–231.

30   Ibid.

The second element *bšw* entered Hebrew as *-mīš*, Akkadian as *-mešu*, but Arabic as *-bus*. In most of these reflexes, Egyptian /b/ is realized as /m/ in Hebrew. This is paralleled in at least one other word,[31] Hebrew חַרְטֹם *ḥarṭōm* 'magician' from Egyptian *ḥry-tp* 'chief (magician)'. Noonan notes that Egyptian /b/ > /m/ is conditioned by the proximity of a /u/-vowel. This is only true of Egyptian loanwords into Hebrew, and not of native Hebrew vocabulary nor Akkadian loans into Hebrew, which suggests that this is a creature of perception. There is no group-writing sequence for /bu/ in the New Kingdom[32] (contrast Middle Kingdom *bw* for /bu/[33]), and may be related to the lenition of /b/ > /β/ in Coptic, which Allen reconstructs for the New Kingdom.[34] Therefore, New Kingdom /b/ [β] was sometimes interpreted as /m/ by Semitic speakers, especially when proximal to /u/.

The disparities in the phonetic realization in the Semitic borrowings are best explained through known sound changes in Ancient Egyptian, and therefore indicate a series of separate borrowing events:

1. NK [b] /b/ > /β/
2. NK   ū   > ē
3. NK [ꜣ] /χ/ > /ʔ/
4. NK [r]   /l/ > /r/

1. MK Egy. *ꜣnr bšw* */χanlbūš/   → Arabic خَلْنَبوس *ḫalnabūs*
2. MK Egy. *ꜣnr bšw* */χanlβēš/   → Hebrew חַלָּמִישׁ (*/χallāmīš/)
3. NK Egy. *ꜣnr bšw* */ʔanlβēš/   → Akkadian *ellimēšu > elmēšu >*
                                      Aramaic אלמסא *ʾlmsʾ > Arabic ألماس *ʾalmās*
4. Demotic *ꜣnr bšw* */ʔanrβēš/   → Greek ἀδάμας

Ultimately, I suggest that the marginal phrase *ꜣnr bšw* is the source of חַלָּמִישׁ *ḥallāmīš* and its cognates. This is difficult given that *ꜣnr bšw* is quite marginal, in fact, it is exclusive to the aforementioned 18th Dynasty spell. But this difficulty is not as great as it first appears. First, the present corpus of Ancient Egyptian is still quite limited, especially in the realm of magical texts. As a magical term, *ꜣnr bšw* may have had the potential to wander between languages, which motivated its spread. On its own, 'flint' is not a likely contender for a cultureword, as

31   Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press. 241.

32   Allen, James P. (2020). *Ancient Egyptian Phonology*. Cambridge University Press. 36–37.

33   Ibid., 51.

34   Ibid., 47.

the material is abundant around the Levant, and flintknapping several magnitudes older than Bronze Age Levantine cultures. Additional attestations of *ꜣnr bšw* would certainly do much to either bolster or undermine my interpretation as 'sparking stone', an epithet of flint.

3 Afterword: Implications for the Reconstruction of Ancient Egyptian Phonology

It has not escaped notice that this suggestion has implications for the reconstruction of the phonology of ⟨ꜣ⟩, because it confirms the uvular fricative quality of ⟨ꜣ⟩, while suggesting voicelessness. Many scholars reconstruct the realization of ⟨ꜣ⟩ in the Middle Kingdom as [ʁ]. This hypothesis is encumbered by the wide claim that Egyptian did not contrast voicing, yet ⟨ꜣ⟩ certainly contrasted with ⟨ḥ⟩ and ⟨ẖ⟩ in Middle Egyptian. This scenario may be resolved if Middle Kingdom ⟨ꜣ⟩ was pronounced /χ ~ ʁ/, contrasting with ⟨ḥ⟩ /χʰ ~ ʁʰ/ or /x ~ ɣ/ and ⟨ẖ⟩ /χʲ ~ ʁʲ/ or /xʲ ~ ɣʲ/.

4 Harmonizing the Data

Akkadian *ṣurru* 'flint, obsidian'[35] expanded to include rock crystal (massive quartz). On analogy of Akkadian *ṣurru* with the foreign borrowing *elmēšu* 'flint', *elmēšu* may have also expanded to include rock-crystal. This would then explain the more semantically divergent cognate Arabic ٱلْمَاس *'almās* 'diamond', which may derive from Akkadian through Aramaic (as in Syriac ܐܠܡܣ *'lms'*). The semantic development *flint → obsidian → quartz → diamond* is a far smoother transition then *flint → diamond* proposed by other scholars. Perhaps in the same way *ṣurru* 'flint, obsidian' was expanded to include 'rock crystal', as they were all used in points, the category was further expanded to include 'corundum, diamond' for their use in etching. However, we would then be forced to reconstruct the same semantic development independently for Greek ἀδάμας *adamas*. Greek ἀδάμας *adamas* may have come to mean 'diamond' through 'steel' as an intermediary, in the sequence *flint → steel → diamond*.

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35   Frahm, Ellery Edward. (2010). *The Bronze-Age obsidian industry at Tell Mozan (ancient Urkesh), Syria: redeveloping electron microprobe analysis for 21st-century sourcing research and the implications for obsidian use and exchange in northern Mesopotamia after the Neolithic*. University of Minnesota. 91.

It appears that צֹר ṣōr represents an inherited word from Proto-Semitic *ṯurr-meaning 'flint, obsidian'. Flint would be cheaper and more readily available in the Bronze Age then obsidian, which is not found in the Levant. The secondary meaning 'rock crystal' for צֹר ṣōr would appear to be an Akkadianism from the middle first millennium BCE. The Egyptian borrowing חַלָּמִישׁ ḥallāmīš refers strictly to flint in Hebrew, and belongs to a wide family of cognates from around the Mediterranean. These words have a degree of semantic flexibility which remains partially unexplained.

CHAPTER 19

שַׁיִשׁ/שֵׁשׁ *Šayiš*/*Šēš* & גִּר *Gir*—Limestone

1 שַׁיִשׁ/שֵׁשׁ *Šayiš*/*Šēš*

The term שַׁיִשׁ *šayiš* is extant in two very similar forms: the aforementioned שַׁיִשׁ *šayiš* and a secondary form שֵׁשׁ *šēš*. This stone is ubiquitous in the biblical text, appearing in an array of contexts as a common ornamental stone, not a gem-stone. The most important references may be easily surveyed.

In Chronicles, שַׁיִשׁ *šayiš* is described as a plentiful but valuable stone used in the construction of the First Temple:

שַׁיִשׁ (1 Chronicles 29:2):

וּבְכָל־כֹּחִי הֲכִינוֹתִי לְבֵית־אֱלֹהַי הַזָּהָב לַזָּהָב וְהַכֶּסֶף לַכֶּסֶף וְהַנְּחֹשֶׁת לַנְּחֹשֶׁת הַבַּרְזֶל לַבַּרְזֶל
וְהָעֵצִים לָעֵצִים אַבְנֵי־שֹׁהַם וּמִלּוּאִים אַבְנֵי־פוּךְ וְרִקְמָה וְכֹל אֶבֶן יְקָרָה וְאַבְנֵי־שַׁיִשׁ לָרֹב:

I have spared no effort to lay up for the House of my God gold for golden objects, silver for silver, copper for copper, iron for iron, wood for wooden, onyx-stone and inlay-stone, stone of antimony and variegated colors—every kind of precious stone and much *šayiš*.

Similarly, in Chronicles שַׁיִשׁ *šayiš* is described as a valuable material used in pillars:

שֵׁשׁ (Song of Songs 5:15):

שׁוֹקָיו עַמּוּדֵי שֵׁשׁ מְיֻסָּדִים עַל־אַדְנֵי־פָז מַרְאֵהוּ כַּלְּבָנוֹן בָּחוּר כָּאֲרָזִים:

His legs are like pillars of *šayiš* set in sockets of fine gold. He is majestic as Lebanon, stately as the cedars.

Many scholars have argued that the primary building stone of the Temple would probably have been locally-quarried limestone, which is almost certainly what the שַׁיִשׁ *šayiš* in Song of Songs and Chronicles refers to. In a similar architectural context but distant geography, שֵׁשׁ *šēš* is listed as a component of the flooring in the Persian palace at Susa:

שֵׁשׁ (Esther 1:6):

חוּר כַּרְפַּס וּתְכֵלֶת אָחוּז בְּחַבְלֵי־בוּץ וְאַרְגָּמָן עַל־גְּלִילֵי כֶסֶף וְעַמּוּדֵי שֵׁשׁ מִטּוֹת זָהָב וָכֶסֶף
עַל רִצְפַּת בַּהַט־וָשֵׁשׁ וְדַר וְסֹחָרֶת:

[There were hangings of] white cotton and blue wool, caught up by cords of fine linen and purple wool to silver rods and columns of *šayiš*; and there were couches of gold and silver on a pavement of metagreywacke, *šayiš*, hematite, and faience.

Unique among the stones of Classical Hebrew, שַׁיִשׁ *šayiš* remained a living vocabulary word into the Mishnaic period. The most diagnostic usage in the Mishna[1] is an obscure reference to שַׁיִשׁ *šayiš* as the material of tabletops:[2]

הַשֻּׁלְחָן וְהַדֻּלְפְּקֵי שֶׁנִּפְחֲתוּ, אוֹ שֶׁחִיפָּן בְּשַׁיִשׁ וְשִׁיֵּר בָּהֶן מְקוֹם הַנָּחַת הַכּוֹסוֹת, טְמֵאִין;
רַבִּי יְהוּדָה אוֹמֵר, מְקוֹם הַנָּחַת חֲתִיכוֹת:

The table and the *delphike* (δελφική) that were damaged, or that are covered in *šayiš* and enough room for cups to be set; impure. *Rabbi Yəhūḏā* argues, enough room for pieces (of meat).

A fragment of a tabletop was found in Jerusalem, dated to the end of the Second Temple Period. This artifact appears to be composed of the white limestone so common in the Jerusalem area, providing a material example of what the *Mishna* is referring to. It was announced over Facebook in mid-2020,[3] but the IAA failed to respond to requests for additional information. Ben-Ami records chalk tabletop fragments found in Jerusalem, dating to the same period.[4] Rahmani describes another stone tabletop; though he does not name the exact stone used, it appears to be an off-white limestone.[5] Comparing the Mishna's description of the composition of tabletops with the archeological record, indicates that שַׁיִשׁ *šayiš* was almost certainly the white limestone common in central Israel. Taken with the practical consideration that the primary building

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1 Mishnah, Tractate *Kelim* 22:1.
2 Tabory, Joseph. (1979). The Household Table in Rabbinic Palestine. *AJS review*, *4*, 211–215.
3 www.facebook.com/cityofdavid.en/posts/4754477427911917. Retrieved 9 March 2023.
4 Ben-Ami, Doron, & Tchekhanovets, Yana. (2011). The Lower City of Jerusalem on the eve of its destruction, 70 CE: a view from Hanyon Givati. *Bulletin of the American Schools of Oriental Research*, *364*(1), 61–85.
5 Rahmani, Levi Y. (1974). Table-top of the late Second Temple Period. *'Atiqot: Hebrew Series/'Atiqot: Hebrew Series* 9–10. [Hebrew].

stone of the Temple would probably have been locally-quarried limestone, the evidence points to *limestone* as the referent of שַׁיִשׁ *šayiš*.

Lambdin was perhaps the first to suggest that Hebrew שַׁיִשׁ *šayiš* is loan-word from Ancient Egyptian *šs*.[6] The semantic range of Ancient Egyptian *šs* is mostly restricted to building material, but is occasionally applied in the context of semi-precious gemstones (presumably, a form of calcium-carbonate such as calcite).[7] Egyptian *šs* is securely identified as travertine, an attractively banded yellow-orange form of calcium carbonate ($CaCO_3$). In Egyptological publications, travertine is commonly referred to as "alabaster", a generic term which refers to both travertine and gypsum.[8] The Ancient Egyptians surely differentiated between the two species, so it is appropriate to use the more geologically precise term. Given that the evidence for שַׁיִשׁ *šayiš* points to limestone, that its etymon *šs* should be identified with travertine requires explanation.

I have already presented two complementary lines of evidence that support 'limestone' over 'travertine', but there is one even more definitive. When exposed to ultraviolet sunlight for a sufficient period of time, travertine loses its distinctive banded yellow-orange color in a process described as "bleaching".[9] The references in Song of Songs and Chronicles to שַׁיִשׁ *šayiš* could refer to travertine, but that would require all of it to be located inside the Temple, not in the courtyard or on the outside, where it would quickly be bleached to white.

Egyptian *šs* may be restricted to travertine, but based on how שַׁיִשׁ *šayiš* is described in the Hebrew Bible the meaning seems to have shifted to limestone in Hebrew. It is difficult to explain why a Semite would have applied a foreign term to a common native stone. Limestone and travertine are chemically identical, both forms of calcium carbonate ($CaCO_3$), but they look quite different. Because the two stones would not likely have been confused by an ancient person, something else must have motivated a shift. Perhaps Semitic workers accustomed to using travertine reapplied the name to the Levantine limestone when travertine became unavailable?

Putting aside the semantic disparity, two phonological oddities in this word require explanation. The attention of previous scholars was caught by a dispar-

6   Lambdin, Thomas O. (1953). Egyptian Loan Words in the Old Testament. *Journal of the American Oriental Society*, *73*(3), 145–155.

7   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. Page 78.

8   Harrell, James A. (1990). Misuse of the term "alabaster" in Egyptology. *Göttinger Miszellen*, *119*, 37–43.

9   Harrell, James A, et al. (2007). The origin, destruction and restoration of colour in Egyptian travertine. *Archaeometry*, *49*(3), 421–436.

ity between the realization of the Egyptian and Hebrew sibilants. Hebrew שַׁיִשׁ *šayiš* uses the sibilant [š] twice, whereas its Egyptian etymon *šs* uses two different sibilants [š] and [s]. However, this discrepancy is easily accounted for by contextualizing it with inherited Hebrew words possessing two sibilants. The harmonization of remote sibilants was a regular process operating within an ancestor of Hebrew. Compare:

1. Proto-Semitic **śams* → Canaanite **sams* → Hebrew *šemeš* שֶׁמֶשׁ
2. Proto-Semitic **śalāṯ* → Canaanite **ṯalāṯ* → Hebrew *šālōš* שָׁלֹשׁ

The quality of the intermedial vowel is more difficult to explain. The interchange between the forms שַׁיִשׁ *šayiš* and שֵׁשׁ *šēš* is indicative of a dialectical difference in the reflexes of *-*ay*- between northern and southern dialects of Hebrew. The form שֵׁשׁ *šēš* is a northern dialectal form where *-*ay*- > -*ē*- in the nominative,[10] whereas שַׁיִשׁ reflects the southern (Judahite) dialect where *-*ay*- > -*ayi*- in the nominative.[11] Examples of this phenomenon are found in both the Hebrew Bible and in inscriptions dating to the first millennium BCE.[12] While the Hebrew byforms can be adequately explained as dialectal differences in the realization of *-*ay*-, the reconstruction of -*ay*- is problematic in Ancient Egyptian because /y/ should be represented by Ancient Egyptian orthography.

Lambdin[13] suggested that שַׁיִשׁ *šayiš* represents a backformation from שֵׁשׁ *šēš*, on the basis of Syriac ܫܺܝܫܳܐ *šīšā*, Aramaic שִׁישׁ *šiš*. According to his theory, the original vocalization of Egyptian *šs* would be **šis*. His solution may be improved upon with reference to a quirky chronological disparity between Egyptian and Hebrew. Egyptian developed the phoneme /ē/ from */ū/ around 1200 BCE,[14] which predates the development of /ē/ in Judahite Hebrew by over half a millennium.[15] Supposing that Egyptian *šs* was vocalized **/šēs/* after 1200 BCE, southern Hebrew would struggle to render **/ē/* according to its existing vow-

10   Rendsburg, Gary A. (2003). A comprehensive guide to israelian Hebrew: grammar and lexicon. *Orient*, *38*, 5–35. 11.

11   Suchard, Benjamin. *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill, 2019.

12   Compare semivowel reflexes in Proto-Semitic **wayn* > Canaanite **yayn* > Northern Israelite *yēn* (in Hebrew inscriptions, *yn*), Judahite *yayin*.

13   Lambdin, Thomas O. (1953). Egyptian Loan Words in the Old Testament. *Journal of the American Oriental Society*, *73*(3), 145–155.

14   Loprieno, Antonio. (1996). *Ancient Egyptian: a linguistic introduction*. United Kingdom: Cambridge University Press. 38.

15   Suchard, Benjamin. (2019). *The development of the Biblical Hebrew vowels: including a concise historical morphology*. Brill. 131–132.

els. Southern Hebrew would therefore have dissimilated Egyptian *šēs to *šayš on analogy of words like *yayn → Northern Hebrew יֵן *yēn, Southern Hebrew יַיִן yayin. A similar spontaneous sound-change is reconstructed by Elitzur[16] for the Late Classical Hebrew name of Jerusalem, where *יְרוּשָׁלֵם was altered to the masoretically familiar יְרוּשָׁלַיִם.

There are a few additional cognates, none of which add additional semantic information. Akkadian *sāsu* (NA4*nír.ziz*) refers to a type of *ḫulālu* (NA4*nír*)[17] 'limestone'. The Chicago Assyrian Dictionary lumps *sāsu* (NA4*nír.ziz*) with *sāsu* (*ur.me*) 'moth', though the two words should be separated, as *sāsu* (NA4*nír.ziz*) is surely cognate with Egyptian *šs* and Hebrew שֵׁשׁ/שַׁיִשׁ *šayiš/šēš*. *Sāsu* (spelled *sa-a-su*) is also attested as a West Semitic gloss,[18] but it is not clear whether this is a borrowing from the main Akkadian form. Likewise, it is unclear whether *sāsu* (NA4*nír.ziz*) is a direct borrowing from Egyptian *šs* or merely a Neo-Assyrian rendering of the West Semitic form. On the other hand, Elephantine Aramaic שש *šš*[19] is unambiguously connected to Hebrew שַׁיִשׁ *šayiš*, and may be the oldest attested usage of שש *šš* in Aramaic.

Thus Hebrew שַׁיִשׁ *šayiš* 'limestone' may be reliably derived from Ancient Egyptian *šs* 'travertine' despite the semantic divergence. Based on texts and the material culture of Ancient Israel, שַׁיִשׁ *šayiš* was used to refer to ornamental-grade limestone. But שַׁיִשׁ *šayiš* was not the only Hebrew word for limestone, a wholly separate term existed alongside שַׁיִשׁ *šayiš*.

2　　גִּר *Gir*

There is a second word for limestone in Classical Hebrew which may be semantically differentiated from שִׁישׁ *šayiš*. גִּר *gir*, more recognizably spelled גִּיר in Late Hebrew, is a *hapax legomenon* in Isaiah 27:9. It is borrowed from Sumerian *gir₄*, via Akkadian *kīru*, which refers to a kiln. It is a product of semantic reinterpretation of the word *kīru* from *kiln-stone* to *"gir"-stone*.[20] The etymology

16　　Elitzur, Yoel. (2014). The Biblical Names of Jerusalem. *Maarav*, *21*(1–2), 189–201.

17　　Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *sāsu*.

18　　Cohen, Yoram. (2010). The "Second Glosses" in the Lexical Lists from Emar: West Semitic or Akkadian. *RAI*, *53*(1), 69.

19　　Gottlieb, Isaac. (1980). ʾⁿBṢN ZY ʾBN šš "Alabaster Vessels" (Kraeling 7:18). *Journal of the American Oriental Society*, *100*(4), 512–513.

20　　Noonan, Benjamin J. (2012). *Foreign loanwords and Kulturwörter in Northwest Semitic (1400–600 BCE): Linguistic and cultural contact in light of terminology for realia*. Hebrew Union College-Jewish Institute of Religion (Ohio). 87.

and context indicate that גִּר *gir* probably referred to a lower quality limestone, suitable for burning into lime. This is not limited to any single quality of limestone, it might include fragments of harder limestone and off-color stone, but was probably mostly chalk, which is soft and easily extracted.

3   Afterword

Returning to the subject of שַׁיִשׁ *šayiš*, I want to bring the reader's attention to a potential pitfall of philology: forgery. An Egyptian alabastron recorded from Shlomo Moussaieff's collection is inscribed with a Phoenician dedication. It is an "alabaster vessel" according to the published description[21] of this alabastron, presumably travertine alabaster. The inscription reads:

> *mslt šyš z*
> *mšql blbytm*
> This alabastron(?) of travertine
> ...[22]

The orthography of *šyš* contradicts the usual pattern of II-*y* segolate nouns in Phoenician, which are always written defectively. The plene spelling of the *yodh* of *šyš*, as in this inscription, is unexpected for Phoenician. The northern form of the word would be expected to be *šēš*, and the spelling in a Phoenician inscription should reflect this vocalization. Hebrew can be ruled out as the language of origin, as the spelling of *z* 'this' is defective against the usual spelling of Hebrew זֶה 'this'. Because the alabastron came from the antiquities market, the inscription—if not the vessel itself—is probably forged. Therefore, Phoenician **šyš cannot be considered a valid form.

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21   Orientalis, Aula. (1998). Phoenician Epigraphic Miscellanea. *Aula Orientalis*, *16*, 77–84.
22   Heltzer's original translation is awkward, and therefore no translation for the second line of the inscription is given here.

Other Classical Hebrew Lithonyms

This chapter is an anthology of the Hebrew lithonyms for which there is little to discuss. For some, their identity has long been established, and only the etymological question remains. Of others, more philological sleuthing is required.

1 בַּהַט *Bahaṭ*

Bahaṭ is a *hapax legomenon* in Esther 1:6, occurring in the list of stones used to floor Ahaseurus' palace at Susa:

חוּר כַּרְפַּס וּתְכֵלֶת אָחוּז בְּחַבְלֵי־בוּץ וְאַרְגָּמָן עַל־גְּלִילֵי כֶסֶף וְעַמּוּדֵי שֵׁשׁ מִטּוֹת זָהָב וָכֶסֶף
עַל רִצְפַת בַּהַט־וָשֵׁשׁ וְדַר וְסֹחָרֶת:

[There were hangings of] white cotton and blue wool, caught up by cords of fine linen and purple wool to silver rods and columns of limestone; and there were couches of gold and silver on a pavement of *bahaṭ*, limestone, red hematite, and faience.

The late first occurrence of בַּהַט *bahaṭ* may indicate that it was borrowed at a relatively late period in the history of Classical Hebrew. Esther being in an Achaemenid setting would privilege an Old Persian loan, though no such Persian word from any stage of the language has been identified. Müller[1] may have been the first scholar to connect בַּהַט *bahaṭ* with Ancient Egyptian *ibhtj*, *bht* (the form *ibhtï* is attested in the New Kingdom, *bht* first appears in the Ptolemaic. However, this spelling may reflect an older pronunciation). Harrell et al.[2] suggest that Egyptian *ibhtï* may have first been borrowed into Old Persian, and then into Hebrew. However, Persian /t/ cleanly corresponds with Hebrew ת, so בַּהַט *bahaṭ* was probably a fixed part of Hebrew vocabulary by the Persian period.

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1   W. Max Muller, as contributing editor of: Gesenius-Buhl. *Handwörterbuch über das Alte Testament*, 17th Edition. (1915).

2   Ibid.

While some scholars have been critical about the correspondence between Hebrew ט /t'/ and Egyptian *t*, Noonan[3] argues that this is based on too rigid a notion of the phonological system of both languages. The phonological disparity between Hebrew ט /t'/ and Egyptian *t* may be due to a disparity in the actual realization of the voiceless dental stops of the languages. If the voiceless stops in Late Egyptian were aspirated like /tʰ/, then neither ת /t/ nor ט /t'/ would render the sound perfectly. A parallel may be found in the Hebrew word כּוֹבַע *kōḇaʕ* ~ קוֹבַע *qōḇaʕ* 'helmet', borrowed from Hurrian *kuvaḥi-* 'helmet'. Sapir explained interchange כ /k/ ~ ק /k'/ to be a consequence of the difficulty of rendering /kʰ/ in Hebrew, which lacked aspirated stops.[4] Thus, the phonological correspondence does not pose a problem.

İbhtï is the nisbet form of a place called *İbhꜣt*, which is usually assumed to be somewhere in Nubia, though Takács[5] is quite critical of this assumption. The most recent and comprehensive study is that of Cooper, who did a broad-scale study on peripheral toponyms mentioned in Ancient Egyptian texts.[6] His philological analysis of *İbhꜣt*[7] compiled all known information about the place, using phonological data from comparative linguistics to offer a reasonable etymology and location. He suggests that *İbhꜣt* is Wadi Allaqi in Nubia, and offers some tentative etymological suggestions for the toponym. With the historic controversy as to the location of *İbhꜣt*, the identity of *ibhtï*-stone is likewise debated. It appears to be synonymous with *bḫn* 'metagreywacke' in Egyptian.[8] The connection between בַּהַט *bahaṭ* and 'metagreywacke' is semantically straightforward: בַּהַט *bahaṭ* was used in palace flooring, and 'metagreywacke' is an ornamental stone suited to such a purpose.

Yet on the basis that *ibhtï* was synonymous with *bḫn* 'metagreywacke', Harrell et al.[9] reject 'metagreywacke' for בַּהַט *bahaṭ*. This is insufficient to reject

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3 Noonan, Benjamin J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact* (Vol. 14). Penn State Press.

4 Sapir, Edward. (1937). Hebrew "Helmet," a Loanword, and Its Bearing on Indo-European Phonology. *Journal of the American Oriental Society*, *57*(1), 73–77.

5 Takács, Gabor. (2013). [Review of] Nubian Lexicon in Later Egyptian. *Bibliotheca Orientalis*, *70*(5–6), 569–582.

6 Cooper, Julien. (2020). *Toponymy on the periphery: Placenames of the Eastern Desert, Red Sea, and South Sinai in Egyptian documents from the Early Dynastic until the end of the New Kingdom*. Brill.

7 Ibid, 125–129.

8 Wissa, Myriam. (2011). *İbhꜣ.t* in the autobiographical inscription of Weni: developments since 1994. *Journal of Egyptian Archeology*. Vol. 97, 1.

9 Harrell, James A., James K. Hoffmeier, and Kenton F. Williams. (2017). Hebrew gemstones in the Old Testament: A lexical, geological, and archaeological analysis. *Bulletin for Biblical Research*, *27*(1), 1–52.

metagreywacke as the identity of בַּהַט *bahaṭ*, for perhaps *bḥn* was a synonym, differing in some arcane quality. Perhaps *bḥn* didn't refer to metagreywacke at all. Or as I will argue in the next subchapter, Hebrew reapplied *bḥn* to basalt, and therefore metagreywacke is perfectly suitable for בַּהַט *bahaṭ*. Regardless of the scenario reconstructed, metagreywacke remains the best identification for *ibhtï* and thus בַּהַט *bahaṭ*.

There is another cognate of בַּהַט *bahaṭ* which is less well known. Arabic بَهْت *baht* refers to a type of stone associated with North Africa. Allegedly, Arabic بَهْت *baht* resembles marcasite in color and was used as an eagle-stone.[10] A specific study on the meaning of Arabic بَهْت *baht* would do much to assist identifying the meaning of Hebrew בַּהַט *bahaṭ* and Egyptian *ibhtï, bht*, but no such study is yet available. Until then, this problem remains somewhat open. Whatever the ultimate identity of בַּהַט *bahaṭ*, it is surely tied to the correct identity of Egyptian *ibhtj* and Arabic بَهْت *baht*.

2   בֹּחַן *Bōḥan*

The Classical Hebrew term בֹּחַן *bōḥan* occurs only once, in Isaiah 28:16. It is a term which has been translated in a number of different ways, not all of which are a type of stone.

לָכֵן כֹּה אָמַר אֲדֹנָי יֱהֹוִה
הִנְנִי יִסַּד בְּצִיּוֹן אָבֶן
אֶבֶן בֹּחַן פִּנַּת יִקְרַת מוּסָד מוּסָּד
הַמַּאֲמִין לֹא יָחִישׁ׃

Therefore, thus said the Lord God:
"Behold, I will establish in Zion a stone,
a valuable cornerstone of *bōḥan* surely founded,
He who trusts need not fear.[11]

In a 2013 article,[12] Noonan evaluated five previous interpretations that have been given for this word: 'tested stone', 'testing stone', 'watchtower', 'touchstone (a type of stone)', and 'greywacke (a type of stone)'. The first two translations,

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10   Ibid, footnote 5.
11   Translation is my own, following the grammar indicated by the cantillation.
12   Noonan, Benjamin. J. (2013). Zion's Foundation. *Zeitschrift für die alttestamentliche Wissenschaft*, *125*(2), 314–319. Footnote 34.

'tested stone' and 'testing stone', he disqualifies on contextual, linguistic, and cultural-archeological grounds. In addition to those reasons, 'watchtower' also seems to violate the Masoretic vocalization, and there are alternative terms for 'watchtower' in Classical Hebrew. More interesting is interpreting בֹּחַן *bōḥan* as 'touchstone', which is contextually nonsensical but does find a false friend in Greek βάσανος *basanos* 'touchstone'. Noonan's reasoning requires expansion, as on its own it is insufficient to exclude this interpretation.

A touchstone is a piece of a dark stone, such as slate or lydite, used for evaluating alloys of precious metals. Its finely textured surface allows soft metals to leave a noticeable mark, which may be used to evaluate the purity of a given sample. Touchstones are first attested from the Indus Valley civilization.[13] Touchstone first appears in the Levant in first millennium Akkadian as *pidānu* 'touchstone', an ancient borrowing from Arabic فَتِين *fatīn* 'touchstone'.[14] Evidently, the transfer of this technology from India was mediated through the Arabian Peninsula.

Noonan advanced the possibility that Greek βάσανος *basanos* 'touchstone' was borrowed from an unattested Lydian word, because Theophrastus mentions that βάσανος *basanos* came from Mount Tmolus in Lydia (modern Turkey).[15] His Lydian hypothesis fits the direction of cultureword transfer for touchstone technology. It may even be possible to derive this unattested Lydian word from Akkadian *pidānu* 'touchstone' through a series of known sound changes in Lydian. The Lydian sound represented by ↑ descends from inherited *$d(^h)$ before *i and *u,[16] demonstrated by Heubeck.[17] Lydian ↑ represented a palatal consonant, which Yakobuvich[18] considered most probably to be /tʃ ~ d͡ʒ/ or Kloekhorst[19] /c ~ ɟ/. Either /tʃ/ or /c/ would be rendered as [σ] in Greek. A borrowing scenario for this ancient touchstone cultureword may be reconstructed: Arabic فَتِين *fatīn* → Akkadian *pidānu* → Lydian *ᴟ↑ᙠ → Greek βάσανος *basanos*.

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13   Ansumali Mukhopadhyay, Bahata. (2022). Gold and 'ratti' signs inscribed on Mohenjo-Daro's gold-assaying needles, fish-sign inscriptions signifying gemstones concentrated near lapidaries: Indus script's taxed commodities. *Available at SSRN 4110151*.

14   Kleber, Kristin. (2016). Arabian Gold in Babylonia. *Arabian Gold in Babylonia*, 121–134.

15   *De Lapidibus* 7,45–47.

16   Kearns, John Michael. (1994). The Lydian consonant system. *Kadmos*, 33(1), 38–59.

17   Heubeck, Alfred. (1959). Lydiaka: Untersuchungen zu Schrift, Sprache und Götternamen der Lyder. *Erlanger Forschungen*/A, 9.

18   Yakubovich, Ilya. (2005). Lydian etymological notes. *Historische Sprachforschung/Historical Linguistics*, 118, 75–91.

19   Kloekhorst, Alwin. (2023). New Interpretations in Lydian Phonology. In: *New approaches on Anatolian linguistics*, 115–133.

If there was a word for touchstone in Classical Hebrew, it would probably be a cognate of Arabic فَتِين *fatīn* and Akkadian *pidānu*. בֹּחַן *bōḥan* is a *u*-segolate noun reconstructible to *buḥn or *buḫn, which is phonologically incompatible with all of the reflexes of Arabic فَتِين *fatīn*. A connection between בֹּחַן *bōḥan* and Greek βάσανος *basanos* must be rejected, so the origin of בֹּחַן *bōḥan* must be sought elsewhere. Sethe[20] may have been first to recognize that בֹּחַן *bōḥan* represents a loan from another ancient lithonym entirely, Ancient Egyptian *bḫn* 'metagreywacke'. Ancient Egyptian *bḫn* has often been erroneously glossed 'touchstone' due to confusion with Greek βάσανος *basanos*, an error which was already found in the ancient writers. In one place[21] in his *Natural History*, Pliny describes the *basaniten* of Aethiopia, of which he is certainly referring to the metagreywacke of Wadi Hammamat. Indeed, the word *basaniten* has a track-record of textual corruption. A corrupted version of *basanos* gave rise to the word 'basalt',[22] but even the "correct" reading *basaniten* could be a textual error for a form like *besniten, the expected Demotic to Greek to Latin reflex of *bḫn* (from *buḫn).

Egyptian *bḫn* 'metagreywacke' and Greek βάσανος *basanos* 'touchstone' are unrelated. The vowel pattern reconstructed for Egyptian *bḫn* (*buḫn) is irreconcilable with Greek βάσανος *basanos*. The correspondence between Egyptian *ḫ* and Greek σ /s/ is impassable. Although Egyptian *ḫ* often merged into Sahidic ϣ /š/, which would have been rendered with Greek σ /s/, the chronology and geography exclude this explanation. The earliest mention of βάσανος *basanos* is in Theophrastus, who associates the stone with Lydia, not Egypt! It is not until Pliny that *basaniten* is associated with Egyptian metagreywacke, and even then, this may be a copyist's hypercorrection. Even if Pliny originally wrote *basaniten*, this must have been due to the similar sound of the words and appearance of these stones. Hebrew בֹּחַן *bōḥan* and Ancient Egyptian *bḫn* must be separated from Greek βάσανος *basanos* 'touchstone' and the other touchstone words.

Having established the etymological distinction between Greek βάσανος *basanos* 'touchstone' and Egyptian *bḫn*, it is appropriate to establish the basis for identifying *bḫn* with *metagreywacke*. Egyptian sources mention a place in the Eastern Desert called *Ḏw-n(.y)-Bḫn(.w)*, from which *bḫn* (sometimes spelled *bḫn*)-stone was quarried. This site has been identified as Wadi Ham-

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20   Sethe, Kurt Heinrich. (1933). *Die Bau-und Denkmalsteine der alten Ägypter und ihre Namen.* Akademie der wissenschaften, im kommission bei W. de Gruyter u. Company.

21   36:11.

22   Tietz, Olaf, & Buchner, Joerg. (2018). The origin of the term 'basalt'. *Journal of Geosciences, 63*(4), 295–298.

mamat in the central Eastern Desert,[23] and *bḫn*-stone as "a slightly meta-morphosed, [meta]graywacke sandstone to siltstone with abundant secondary chlorite and epidote, which give it a greenish color".[24] Cooper[25] posits an Egyptian etymology for *bḫn*, from the verb *bḫn/bḥn* 'to cut'. Some scholars[26] have been hesitant to equate בֹּחַן *bōḥan* with metagreywacke, because meta-greywacke is a specific ornamental stone that does not occur in Israel. However, objects of Egyptian metagreywacke have been recovered in the Levant, includ-ing several from Hazor.[27]

Returning to the context, Isaiah cannot be using בֹּחַן *bōḥan* to refer literally to a foundation stone, as the actual bedrock of Jerusalem is limestone. Rather, it must be that בֹּחַן *bōḥan* is being used metaphorically. Other than for statues, metagreywacke was commonly used for stelae in Egypt. Perhaps then, Isaiah is using the metaphor of a metagreywacke cornerstone to allude to the notion of a stele. On this metaphorical stele the concluding words of the verse, הַמַּאֲמִין לֹא יָחִישׁ "the one who is loyal need not fear", would be inscribed.[28] Thus, בֹּחַן *bōḥan* refers to the material of a metaphorical stele.

Although no Israelite stelae have been recovered, the famous Mesha stelae from neighboring Moab is composed of basalt.[29] Basalt was overwhelmingly the material of choice for Levantine monuments.[30] In all likelihood, basalt was the material of choice for Israelite stelae too. Basalt is phenotypically similar to metagreywacke; both species are hard gray stones, quite suitable for stonework. The major advantage to basalt over metagreywacke is that the latter would require importation from Egypt, whereas basalt is common in the vicinity of Israel. A West Semitic word for basalt is currently unknown. Conceivably, the

23   Cooper, Julien. (2020). *Toponymy on the periphery: Placenames of the Eastern Desert, Red Sea, and South Sinai in Egyptian documents from the Early Dynastic until the end of the New Kingdom.* Brill. 206–208.

24   Harrell, James A. (2023). *Archaeology and Geology of Ancient Egyptian Stones.* Archaeo-press. 2.8.2.

25   Cooper, Julien. (2020). *Toponymy on the periphery: Placenames of the Eastern Desert, Red Sea, and South Sinai in Egyptian documents from the Early Dynastic until the end of the New Kingdom.* Brill. 206.

26   Noonan, Benjamin. J. (2013). Zion's Foundation. *Zeitschrift für die alttestamentliche Wissenschaft, 125*(2), 314–319. Footnote 34.

27   Connor, S., Laboury, D., Marée, M., Ben-Tor, D., Martin, M., Ben-Tor, A., & Sandhaus, D. (1990). Egyptian Objects. *Hazor VII: The, 2012,* 574–603.

28   Dekker, Jaap. (2007). *Zion's rock-solid foundations: an exegetical study of the Zion text in Isaiah 28:16* (Vol. 54). Brill. 57, footnote 144.

29   Bonney, T.G. (1902). III.—The Basalt of the Moabite Stone. *Geological Magazine, 9*(11), 493–495.

30   Richey, Madadh. (2021). The Media and Materiality of Southern Levantine Inscriptions. *Scribes and scribalism,* 29–39.

Israelites reapplied the Egyptian borrowing *buḥn to basalt to fill this semantic hole. Assuming semantic dissimilation of bḥn to 'basalt' would explain the co-occurence of Egyptian ibhtï 'metagreywacke' and bḥn 'metagreywacke' in Hebrew.

3   גָּפְרִית *Goprīṯ*

The "fire and brimstone" describing the destruction of Sodom is a familiar English idiom. Less familiar to English speakers is the meaning of *brimstone*, an archaic term for sulfur. Sulfur is the chemical element (S) occupying the sixteenth position on the periodic table, which occurs natively in bright yellow octasulfur (S_8) macrocrystals and microcrystal lumps. *Brimstone* (or *sulfur*) is a translation of גָּפְרִית *goprīṯ*, part of a family of Levantine words for sulfur. גָּפְרִית *goprīṯ* reflects the underlying form *guprīt-, and was traditionally assumed to be a non-Semitic loanword given that its cognates Aramaic כַּבְרֵתָא *kabrēṯā*, גּוּפְרֵיתָא *gūprēṯā*, Syriac ܟܶܒ݂ܪܺܝܬ݂ܳܐ *kĕbrīṯā*, Akkadian *kubrītu*, *kibrītu*, Arabic كِبْرِيت *kibrīt*, Hurrian *kibriti* 'sulfur', Hittite *kipriti-*, and NK Egyptian *kbrt* (in group writing, *ka=bi=ra=ta*) display irregular correspondence in the voicing of the first two consonants.

Dissenting from the traditional view of a non-Semitic loan, Ellenbogen[31] instead suggested that these forms may originate with Akkadian *kibrītu*. Placing sulfur in its ancient context, one notes that the world's largest sulfur deposit is in the Mishraq region[32] of Iraq, with the Tigris running through it. In Ellenbogen's narrativization, *kibrītu* referred to the lumps of sulfur that float down the Tigris, which wash ashore the bank of the river. To Ellenbogen, this hinted at the etymology of *kibrītu*. He noted that the cuneiform spelling is identical to *kibir* ^ilu^*nāri* 'bank of a river' (KI.A.^d^ÍD). Perhaps the Akkadians innovated a word for sulfur based on the riverbanks from which sulfur lumps were recovered. He therefore derives *kibrītu* from Akkadian *kibru* 'riverbank', with the derivative *-īt-* suffix.

The most recent treatment of this word is found in Dr. Benjamin J. Noonan's dissertation on loanwords in Northwest Semitic.[33] In personal correspondence,

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31   Ellenbogen, Maximilian. (1962). *Foreign words in the Old Testament: their origin and etymology*. Luzac & Company.

32   Barker, James M., Cochran, D.E., & Semrad, R. (1979). Economic geology of the Mishraq native sulfur deposit, northern Iraq. *Economic Geology, 74*(2), 484–495.

33   Noonan, Benjamin J. (2012). *Foreign loanwords and Kulturwörter in Northwest Semitic (1400–600 BCE): Linguistic and cultural contact in light of terminology for realia*. Hebrew

he advanced two reasons to consider this *sulfur*-cultureword as an intersemitic loan over a borrowing from outside Semitic. One, there does not appear to be a non-Semitic source to donate this word to its neighbors, as Hittite, Hurrian, and Egyptian borrowed their reflexes from Akkadian *kibrītu*. Two, this cultureword is widespread in Semitic languages, which is generally unusual for non-Semitic loans. The irregular correspondence mitigates against an inherited word, but Ellenbogen's hypothesis resolves this difficulty. Thus Hebrew גָּפְרִית *gop̄rīṯ* and its cognates appear to be borrowings from Akkadian *kibrītu*.

There are a pair of forms which stand out from the rest of the cognates. Hebrew גָּפְרִית *gop̄rīṯ* and Aramaic גּוּפְרֵיתָא *gūp̄rēṯā* display an initial syllable which harkens back to *gup-*, over the more common (and etymological) *kip-*. Noonan argues that "[b]ecause initial *k* of Akkadian first millennium loans into Northwest Semitic always corresponds to *k*, the usage of ג rather than כ indicates that Hebrew גָּפְרִית was borrowed before the first millennium BCE."[34] This is awkward, as if first millennium Akkadian *k-* always corresponds to כ /k/ in borrowings into Northwest Semitic, surely Akkadian loans in an earlier period should also be expected to correspond to כ /k/! A simpler solution might be that Hebrew גָּפְרִית *gop̄rīṯ* and Aramaic גּוּפְרֵיתָא *gūp̄rēṯā* were mediated through a different language, which voiced the initial consonant and backed the vowel.

4   דַּר *Dar*

The *hapax legomenon* דַּר *dar* only occurs in *Esther* 1:6. Based on the context of the verse, דַּר *dar* must refer to a material suitable for flooring a palace, as it is listed alongside other stones suitable for the same purpose. As Esther 1:6 reads:

חוּר כַּרְפַּס וּתְכֵלֶת אָחוּז בְּחַבְלֵי־בוּץ וְאַרְגָּמָן עַל־גְּלִילֵי כֶסֶף וְעַמּוּדֵי שֵׁשׁ מִטּוֹת זָהָב וָכֶסֶף
עַל רִצְפַת בַּהַט־וָשֵׁשׁ וְדַר וְסֹחָרֶת:

[There were hangings of] white cotton and blue wool, caught up by cords of fine linen and purple wool to silver rods and columns of limestone; and there were couches of gold and silver on a pavement of metagreywacke, limestone, *dar,* and faience.

Without any obvious cognates, it is difficult to etymologize דַּר *dar* because nothing about it is phonetically notable. It probably should be reconstructed **dir* with vowel change **i > a*, because **a* would have lengthened to **ā* had the form been ***dar(r)*.

No proposed intra-Hebrew etymology is convincing. A connection with Hebrew דּוֹר *dōr* 'generation' or any of its Semitic cognates is dubious. In the Old Greek version of the Septuagint, דַּר *dar* was translated as πιννίνου *pin̆-ninou* 'pearl', accordingly, previous authors compared דַּר *dar* with Arabic دُرّ *durr* 'pearls (collective)' and Ethiopic *dar* 'pearl'. However, it is a mistake to rely on the Septuagint to identify the stones of Classical Hebrew. For Esther in particular, the discrepancy is great between the Masoretic Text and the other recensions of the book. 'Pearl' does not fit the context of Hebrew דַּר *dar* at all because pearls are unsuitable for incorporating into the pavement of a palace floor. Some scholars suggested 'mother-of-pearl' as an alternative, an attempt to bandage a broken theory instead of a plausible alternative.

A wiser approach may be to explore the gamut of languages known to donate vocabulary into Hebrew to find a reasonable cognate. Whereas the context of Esther would incline one to look to Old Persian, the small corpus of known Old Persian words makes such a donor, if it existed at all, probably impossible to uncover. An Akkadian source isn't out of the question, though Akkadian *dūru* 'city wall' is certainly not the donor. I am intrigued by a possible connection with 𒁇, the first element in Akkadian 𒁇𒁹𒈾𒄷 *dar-lugal*[mušen] 'rooster'. In Sumerian, 𒁇 normally stands for *gun₃* 'multicolored'. The source of Akkadian 𒁇 *dar* 'multicolored(?)' is therefore unclear. Another Sumerian form to consider is Sumerian *dara₄* 'red-brown', although this word does not seem to have entered Akkadian, so has limited plausible paths into Hebrew.

The other three paving-stones in Esther 1:6 are loans from Ancient Egyptian, so it is most reasonable to look there for a plausible donor. Perhaps Hebrew דַּר *dar* is derived from the Egyptian stone *ṯr*, which Harris has tentatively identified as red hematite.[35] Identifying *ṯr* with red hematite is strongly supported by the context in which *ṯr* is used: both as a pigment and in a solid form for a headdress and statuette.[36] Egyptian *ṯr* is homophonic (at least consonantally) with Egyptian *ṯr, t(w)r* 'blood', an appropriate base from which to derive a term for blood-red hematite.

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35   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 154–155.

36   Harris, James R. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Page 154–155.

Could דַּר *dar* be derived from Ancient Egyptian *ṯr* 'red hematite'? In Old to Middle Kingdom Egyptian, ⟨ṯ⟩ was probably realized as */t͡ʃ/.[37] By the New Kingdom in most dialects,[38] ⟨ṯ⟩ had merged to /t/, this is reflected as ת in loans into Hebrew.[39] Although the correspondence between Egyptian ⟨ṯ⟩ and Hebrew ⟨ד⟩ is absent from Muchiki,[40] the proximity of ⟨ṯ⟩ to the rhotic ⟨r⟩ /r/ may have triggered voicing in ⟨ṯ⟩ /t/ when loaned into Hebrew. Vowels are not usually indicated in the orthography of Egyptian, so the vowel(s) of *ṯr* must be interpolated. If דַּר *dar* is borrowed from Ancient Egyptian *ṯr*, it would have been prior to the Ramesside period, when syllable-final /r/ was lost in Egyptian.[41] Phonologically, דַּר *dar* is a plausible match for *ṯr*.

Study of the floor of Darius' Palace at Susa has uncovered extensive use of plaster that has been impregnated with coloring agents (perhaps to imitate natural stone?).[42] Plaster flooring covered in red ochre may have been intended to imitate red hematite tiles.[43] To red hematite-colored flooring, use of an existing Hebrew word for red hematite would certainly have been appropriate. While the only attested use of דַּר *dar* may be for 'red hematite-colored plaster', an original meaning *'red hematite' may be inferred. On phonological and semantic grounds, a derivation of דַּר *dar* from Ancient Egyptian *ṯr* 'red hematite' is more semantically and archeologically appropriate than 'pearl'.

5 מֶלַח *Melaḥ*

The term מֶלַח *melaḥ* is usually (and correctly) translated as 'salt'. On the basis of Aramaic מְלַח *məlaḥ*, מִלְחָא *milḥā*, Arabic ملح *milḥ*, Ugaritic *mlḥt*, and the verbal root *m-l-ḥ* 'to salt' in Geez and Tigre, the Proto-West Semitic term **milḥ-*

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37   Personal correspondence with Dr. Doug Henning.

38   Kilani, Marwan. (2021). Phonological change and interdialectal differences between Egyptian and Coptic: ḏ, t→ c= ϫ versus ḏ, t→ t= ⲧ. *Diachronica*, *38*(4), 601–627.

39   Noonan, B.J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press.

40   Muchiki, Yoshiyuko. (1999). *Egyptian proper names and loanwords in North-West Semitic*. Society of Biblical Literature.

41   Adrom, F. & Müller, M. (2017). The Tetragrammaton in Egyptian Sources—Facts and Fiction. In J. van Oorschot & M. Witte (Ed.), *The Origins of Yahwism* (pp. 93–114). Berlin, Boston: De Gruyter. https://doi.org/10.1515/9783110448221-005. Page 100.

42   Aloiz, Emily, Douglas, Janet G., & Nagel, Alexander. (2016). Painted plaster and glazed brick fragments from Achaemenid Pasargadae and Persepolis, Iran. *Heritage Science*, 4, 1–10.

43   Perrot, Jean, Curtis, John, & Colon, Gérard. (2013). *The Palace of Darius at Susa: the great royal residence of Achaemenid Persia*. Tauris.

may be reconstructed.[44] The standard Akkadian term for salt is *ṭābtu*, found in texts as ancient as Old Akkadian. Akkadian *ṭābtu* appears to be an innovation from the shared Semitic root *ṭ-y-b* 'to be good',[45] and therefore **milḫ-* should be reconstructed to Proto-Semitic. A broader genealogical relationship between PS **milḫ-* with Egyptian *ḥmꜣt* 'salt'[46] is likely, a comparison missed by the Afroasiatic comparicists (Bomhard compares Egyptian *ḥmꜣt* 'salt' with Semitic **ḥ-m-ṣ́* 'to be sour',[47] Ehret missed these words entirely[48]). To this comparison might be added Fyer *ʔama* 'salt' (from West Chadic **ḥam-* 'salt') and Musgu *hɔm-* 'salt' (from Central Chadic **χwam-* > **χam-* 'salt').[49] The absence of /l/ in the Chadic cognates suggests an Afroasiatic form like PAA **ḥam-* 'salt', with stem Semito-Egyptian **ḥam-l-* innovating[50] a third radical /l/.

Afroasiatic etymology aside, the semantics are more salient. In English, *salt* means different things to different people. The average citizen of the developed world interprets *salt* as *table salt*, which is mostly sodium chloride (NaCl), a mineral referred to as *halite* in geological literature. This usage is mostly accurate for מֶלַח *melaḥ*, though מֶלַח *melaḥ* is the second element in יָם הַמֶּלַח *Yām Hammelaḥ* 'Dead Sea'. Dead Sea salt is considerably more mineralogically diverse than seawater, containing a significant proportion of calcium, potassium, and magnesium cations, as well as bromine anions.[51] Chemists and those in overlapping discipline use *salt* to refer to any chemical composed of atoms ionically bonded in a structure which results in no net charge. Such a chemical definition is far too broad to encompass the Bronze-Iron Age understanding of salt, which probably included all colorless crystalline minerals that taste salty.

44   Kogan, Leonid. (2011). 8. Proto-Semitic Lexicon. In *The Semitic Languages* (pp. 179–258). De Gruyter Mouton. 239.

45   Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry, *ṭābtu* A.

46   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 189–190.

47   Bomhard, Allan R. (2014). Afrasian Comparative Phonology and Vocabulary. *Charleston, Sc.* 315.

48   Ehret, Christopher. (1995). *Reconstructing Proto-Afroasiatic (Proto-Afrasian): vowels, tone, consonants, and vocabulary* (Vol. 126). University of California Press.

49   Orel, Vladamir E, & Stolbova, Olga V. (1994). *Hamito-Semitic Etymological Dictionary Materials for a Reconstruction*. Brill. 273.

50   Agmon, Noam. (2010). Materials and language: Pre-Semitic root structure change concomitant with transition to agriculture. *Brill's Journal of Afroasiatic Languages and Linguistics*, *2*(1), 23–79.

51   Steinhorn, I. (1983). In situ salt precipitation at the Dead Sea. *Limnology and oceanography*, *28*(3), 580–583.

A particularly illustrative use of מֶלַח *melaḥ* is found in Late Hebrew, where a substance called מֶלַח סְדוֹמִית *melaḥ səḏōmīṯ* "Sodomite salt" is mentioned as a popular spice, which was exceptionally dangerous if it got into the eyes.

אמר רב יהודה בריה דרבי חייא מפני מה אמרו מים אחרונים חובה שמלח סדומית יש שמסמא את העינים

Rav Yəhūḏā, son of *Rabbi Ḥiyyā*, said: because of what did [the Sages] say that washing hands after a meal (literally, "final waters") is an obligation? Because Sodomite salt which blinds the eyes.[52]

מֶלַח סְדוֹמִית *melaḥ səḏōmīṯ* "Sodomite salt" is translated by the early commentators on the Mishna as a type of salt called אנצׄראני *anḍrāni* in Judeo-Arabic, which Zohar Amar identifies as either potassium sulfate (K_2SO_4) or carnallite ($KMgCl_2$, $6H_2O$).[53] On pharmacological grounds, I find potassium sulfate to be the more likely identification, as its flavor-enhancing properties and danger to the human eye are well documented.[54] But regardless of which chemical מֶלַח סְדוֹמִית *melaḥ səḏōmīṯ* should be identified with, the usage of מֶלַח *melaḥ* as the first element in this term demonstrates that the semantic range of מֶלַח *melaḥ* was broad enough to encompass other colorless crystalline salts, in line with an ancient understanding of what "salt" intended.

There is a semantically relevant term appropriate to discuss under the topic of *salt*. The term צִיץ *ṣīṣ* 'open salt pan' refers to open areas of salt near the ocean or Dead Sea where saline water evaporated, leaving salt behind. In Classical Hebrew, the word occurs only as an element of the toponym מַעֲלֵה הַצִּיץ *Maʕălē Haṣṣīṣ*, and so the precise meaning of the word has eluded explanation (alleged attestations in Jeremiah 48:9 and Sirach 43:19 are dubious). However, the Ugaritic cognate *ṣṣ* is common enough that the meaning 'open salt pan' could be established by Watson.[55] He further notes that the Ethiosemitic is rich with cognates for Hebrew צִיץ *ṣīṣ* and Ugaritic *ṣṣ*, including Geʕez *ṣew*, *ḍew* 'salt, salty land, sterile land', Tigre *čəwä*, *čiw* "salt", Tigrinya *čäw* "salt", and Amharic *čäw* "salt". These were previously viewed as borrowings from Cushitic by Laslau

52   Babylonian Talmud, Hollin 105b.

53   Amar, Zohar. (2002). *The Book of Incense* (*Sefer Haqetoret*) (in Hebrew). Tel-Aviv: Tel-Aviv University. ISBN 9657163048. OCLC 233392324. *Non vidi.*

54   pubchem.ncbi.nlm.nih.gov/compound/24507#section=Molecular-Formula. Accessed 9 March 2023.

55   Watson, Wilfred G. (2020). A New Proposal for Ugaritic *ṣṣ* "salt, salt-field". *Historiae*, (17), 15–23.

(compare Bilin *šəwa*, Khamir *čəwā*, and Quara *šəwā*), but in light of the Central Semitic cognates, may better be interpreted as part of a larger Afroasiatic heritage. Thus, two Hebrew words pertaining to salt can be reconstructed to the Afroasitic level. The existence and retention of a unique word for open salt pans perhaps indicates that the Israelites and their ancestors acquired salt from them.

6   נֶתֶר *Neṭer*

The word נֶתֶר *neṭer* 'natron' occurs twice in the Hebrew Bible, in Jeremiah 2:22 and in Proverbs 25:20. Natron is a mixture consisting primarily of sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$, a kind of soda ash) and sodium bicarbonate ($NaHCO_3$). The primary and oldest source of natron in the ancient world was the Egyptian site of Wadi El Natrun. Israel likely traded with Egypt for natron, but it is proper to note that there are additional deposits of the substance across the Levant, especially in Anatolia. Sabkhat al-Jabbul in Syria also contains natron, whether it has ever been exploited as source of natron is an open question.[56]

Along with נֶתֶר *neṭer*, many other languages in the ancient world have a word for natron which shares the same shape: Greek λίτρον *litron*, νίτρον *nitron*, Akkadian *nitiru, nitru*, Syriac *neṭrā*; Hittite *nitri*, Latin *nitrum*. The word נֶתֶר *neṭer* originates in Egyptian *nṯrï* 'natron', as does its many reflexes in other Mediterranean languages. Etymologically, Egyptian *nṯrï* may be a special-sense development of *nṯrï* 'divine', a nisbet of *nṯr* 'god', named for its role in magical ritual. It is possible to determine when Hebrew borrowed this word. In Old to Middle Kingdom Egyptian, ⟨ṯ⟩ was probably realized as */t͡ʃ/.[57] By the New Kingdom in most dialects,[58] ⟨ṯ⟩ had merged to /t/, this is reflected as ת in loans into Hebrew.[59] The culturally salient word *nṯr* 'god' may have been an Egyptian interdialectal borrowing, pronounced with a /t/ everywhere.[60]

56   Dardeniz, Gonca. (2015). Was Ancient Egypt the Only Supplier of Natron?: New Research Reveals Major Anatolian Deposits. *Anatolica*, *41*, 191–202.

57   Personal correspondence with Dr. Doug Henning.

58   Kilani, Marwan. (2021). Phonological change and interdialectal differences between Egyptian and Coptic: ḏ, ṯ→ c= ϫ versus ḏ, ṯ→ t= ⲧ. *Diachronica*, *38*(4), 601–627.

59   Noonan, B.J. (2019). *Non-Semitic loanwords in the Hebrew Bible: A lexicon of language contact* (Vol. 14). Penn State Press.

60   Kilani, ibid. 20.

7 שָׁשַׁר *Shāshar*

In scholarly treatments of the biblical stones, שָׁשַׁר *šāšar* is usually omitted. In both verses in which שָׁשַׁר *šāšar* occurs (Jeremiah 22:14 and Ezekiel 23:14), it appears as noun which describes what an object is painted in. These verses are ambiguous as to whether שָׁשַׁר *šāšar* is a color, type of paint, or style. However, etymology clarifies the interpretation. The etymon of שָׁשַׁר *šāšar* is Akkadian *šaršerru* (glossed 'red clay, paste pigment'[61]). The Ancient Mesopotamians used three red minerals as pigments: red ochre, a powdered form of soft red hematite (Fe_2O_3), cinnabar (HgS), and minium (Pb_3O_4). Minium cannot be *šaršerru*, as it is not attested as a paint. Minium better equated with IM.KÙ.SI$_{22}$/*illūr pāni*, which was used to make dark blue glass ingots and therefore probably contained a lead ion.[62]

Cinnabar was unknown in Israel until the Roman period, where it is found as vermillion paint at Herod's palace and as red ink in scrolls from Qumran.[63] The situation does not appear much different in Mesopotamia.[64] In the trilingual DSf inscription, the broken Akkadian word **ṣingabrû* is the equivalent to Old Persian *sinkabruš* and Elamite *ši-in-ka$_4$-ap-ru-iš*, all reflexes of an old culture-word cognate with Greek κιννάβαρι *kinnabari* 'cinnabar'.[65] The identification with cinnabar has been justified by chemical testing from Persepolis.[66] Because cinnabar makes such a late appearance in Mesopotamia, and there is a different Akkadian term (**ṣingabrû*) linked with it, cinnabar should not be identified with *šaršerru*.

Additionally, IM.SA$_5$ (= *šaššarru*) is mentioned in one text as occurring naturally in Mesopotamia: *šumma* IM.SA$_5$ *innamir* "if IM.SA$_5$ is discovered (in a city)".[67] Given the geology of Iraq, this is impossible of cinnabar or minium, but the discovery of red ochre would be a common occurrence. This evidence

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61 Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *šaršerru*.

62 Thavapalan, Shiyanthi. (2019). *The meaning of color in ancient Mesopotamia*. Brill. Page 353.

63 Koren, Zvi. C. (2014). Scientific study tour of ancient Israel. In *Science History: A Traveler's Guide* (pp. 319–351). American Chemical Society.

64 Moorey, Peter Roger Stuart. (1999). *Ancient Mesopotamian materials and industries: the archaeological evidence*. Eisenbrauns.

65 Rosół, Rafał. (2018). The Greek name of cinnabar. *Eos* (*Poland*), *105*(2), 311–322.

66 Moorey, Peter Roger Stuart. (1999). *Ancient Mesopotamian materials and industries: the archaeological evidence*. Eisenbrauns. 327.

67 Chicago Assyrian Dictionary. (1956–2011). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. Chicago: Oriental Institute. Entry: *šaršerru*, first text quoted in a).

makes it clear that Akkadian *šaššarru* (ɪᴍ.sᴀ₅) must be identified as 'red ochre', which is also a very appropriate meaning for Hebrew שָׁשַׁר *šāšar*. Jeremiah 22:14 and Ezekiel 23:14 must be referring to a culturally Babylonian style of painting with red ochre. The primary meaning must have been to the mineral red ochre, used homonymously with the pigment as a secondary meaning.

Akkadian *šaššarru* (ɪᴍ.sᴀ₅) is attested in an array of forms including *šaršarru*, *šarrišarru*, *šeršerru*, and Neo-Assyrian *šaššerru* and *šeššerru*. The original form of the word would appear to have been *šaršarru*, the second /r/ having assimilated to the following *š* in many forms. It appears to be a redoubled Semitic root, but beyond that, it is not clear. In both verses where שָׁשַׁר *šāšar* appears, it occurs at the end of the verse, prefixed and possibly in pause, as בַּשָּׁשַׁר. Therefore, it is not immediately clear whether the first vowel is long (with a *ḳamatz*) or short (with a *pathaḥ*) but in pause. Etymological considerations support the latter view. Mankowski notes that Akkadian *šaššarru* is phonotactically intolerable in Hebrew. As nouns of the pattern $C_1VC_2C_2VC_3C_3$ are partially or totally degeminated when borrowed into Northwest Semitic languages,[68] the first vowel need not have lengthened compensatorily. However, the pattern $*C_1aC_2aC_3$ is realized as קְטָ״ל in Classical Hebrew,[69] so the first vowel of שָׁשַׁר *šāšar* must be long.

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68   Mankowski, Paul V. (2000). *Akkadian Loanwords in Biblical Hebrew*. Eisenbrauns. 149, footnote 554.
69   Fox, Joshua. (2003). *Semitic noun patterns*. Brill. 162.

Final Analysis

Broadly speaking, the correct identifications of non-precious stones were more likely to be preserved than precious ones. For example, גָּפְרִית *goprīṯ* 'sulfur' has been consistently and correctly rendered over the ages. The vocabulary of everyday life is more likely to be preserved under oppression than luxuries. So long as a word was useful enough to survive into Late Hebrew, it is more than likely that it survived beyond that point. As a general rule, only the rarest and most specialized Late Hebrew vocabulary has eluded identification. Words for practical minerals were maintained in Late Hebrew due to their utility, whereas words for precious stones were lost because they were nonessential, displaced by the linguistic prestige of Greek. A prestige language for a prestige product.

1 Patterns in Borrowing

Classical Hebrew contains many borrowed words, with certain areas of the lexicon showing a greater proportion of borrowings than others. Concerning precious stones or stones in general, Classical Hebrew evidences a very high proportion of borrowed vocabulary. Focusing on the twelve stones of the Priestly Breastplate, 10 out of 12 are borrowed, which corresponds to 83.3%.

This high proportion of borrowing lithonyms is a result of several intersecting factors. Canaan is mineral-poor, especially compared to its neighbors. Perhaps with the exception of eilatstone in the Negev (historical Edom), the Land of Canaan lacks precious stone deposits. Israel's precious stones were imported, reflected by the fact that so many lithonyms are borrowed. The borrowing of lithonyms is common cross-linguistically, it is worth exploring why. From an economic standpoint, gemstones were rather unique among goods. Gemstones only occur at specific sites, often far from human habitation. They are small and non-perishable, and thus easily transported, and their fantastic appearance incline them to becoming prestige objects. These qualities make gemstones ideal for import/export. The only other good comparable in these qualities would be precious metals, another mineral product, which share the pattern of trade and linguistic borrowings.

This would account for the large percentage of borrowings from Egypt and Mesopotamia, which were home to large empires. Egypt was an abundant source of precious, ornamental, and building stones in antiquity. In sharp

TABLE 5　　Comparison between terms for select precious stones in ancient languages

Stone	Hebrew	Egyptian	Akkadian	Sumerian	Greek
Carnelian	**אֹדֶם** *ʾōḏem*	ḥrst	sāmtu, sāntu, sāndu	gug	σάρδιον
Peridot	פִּטְדָה *piṭdā*				τοπάζιον, χρυσόλιθος
Greenstone	בָּרֶקֶת *bāreḵeṯ*	nmḥf	(w)urrīqu	sig₇sig₇	σμάραγδος
Turquoise	נֹפֶךְ *nōp̄eḵ*	mfk3t	asgikû	aš.gì.gì	σμάραγδος, καλλαϊς
Lapis Lazuli	סַפִּיר *sappīr*	ḥsbḏ, *ṯfrr	*šipru, uqnû	za.gin	σάπφειρος
?	יַהֲלֹם *yāhălōm*				
Amazonite	לֶשֶׁם *lešem*	nšmt			σμάραγδος
Agate	שְׁבוֹ *šəḇō*	k3	šubû	šuba	ἀχάτης
Red Jasper	אַחְלָמָה *ʾaḥlāmā*	(m)ḫnmt			αἱματίτης
Amber	**תַּרְשִׁישׁ** *taršīš*	škl	sankallu	saŋkal	λιγύριον, ἤλεκτρον
Onyx	שֹׁהַם *šōham*	k3?	pappardilû	babbar.dili	ὀνύχιον, ὄνυξ
Blue Chalcedony	יָשְׁפֵה *yošp̄e*	ṯḥnt (m3ʿt)[1]	yašpû, ašpû	amaš.pa.e₃	ἴασπις

Green marks cognates with Hebrew term
Blue marks parallel developments
Black marks unrelated
[Blank] indicates unknown term
Bold marks Hebrew innovation

contrast, wealthy Mesopotamian empires would import precious stones from sources around their periphery, as Mesopotamia proper is naturally devoid of precious stones. Therefore, the two regions probably served as two different genera of sources for Ancient Israel. Egypt was in the business of directly exporting precious stones, whereas Mesopotamia served as a middleman, a trade hub, but not a producer. From the perspective of historical trade, this linguistic scenario is entirely sensible. Israel was at the geographic crossroad of trade between Egypt, Mesopotamia, and Anatolia. Anatolia, despite its mineral riches, does not appear to have been a major source of gemstones for Israel, evidenced by a paucity of loans into Classical Hebrew with the exception of כַּדְכֹּד *kaḏkōḏ*.

1　Ayil, Ephraim. (2025). The Identity, Etymology, and Material Context of Sōḥereth in Esther 1:6. *Vetus Testamentum*.

Three types of stones found in Canaan were rendered in Classical Hebrew using Egyptian borrowings that referred to entirely different stones. Egyptian *šs* 'travertine' was borrowed into Hebrew *šayiš* with the meaning 'limestone', despite the fact that Egyptian *ꜣnr ḥḏ* intended 'limestone'.[2] The Egyptian term for basalt is still unclear, but *bḫn* 'greywacke' was certainly not it, yet Egyptian *bḫn* 'greywacke' was borrowed into Hebrew as *bōḥan* 'basalt'. Egyptian *fkꜣt* 'turquoise' was loaned into Hebrew as *pūk* 'eilatstone' despite Egyptian *wꜣḏ* 'malachite' being available and more appropriate. Presumably, earlier Canaanite terms for these native stones were displaced by these Egyptian borrowings.

The reapplication of Egyptian ornamental lithonyms (*bḫn* 'greywacke', *šs* 'travertine', *fkꜣt* 'turquoise') to similar but distinct Canaanite stones (*bōḥan* 'basalt', *šayiš* 'limestone', *pūk* 'eilatstone') demands a bold explanation. A few factors mitigate against a simple cultureword borrowing scenario. Unlike with Egyptian precious stones, it is unlikely that Egypt exported greywacke as a raw product. Why Hebrew-speakers would apply the name of a marginal ornamental stone to their native basalt is difficult. The same problem is evident with Egyptian *šs* 'travertine' having been recycled into Hebrew *šayiš* 'limestone'. Finally and most difficult of all, (*m*)*fkꜣt* 'turquoise' is consistently contrasted with *wꜣḏ* 'malachite' in Egyptian, yet in Hebrew *mfkꜣt* has been applied to turquoise, but the byform *fkꜣt* was applied to eilatstone! A cultureword scenario is insufficient to explain the semantic reapplication of these Egyptian lithonyms.

Egypt had the most advanced stone masonry in the Ancient Near East, so it is reasonable to speculate that the Egyptian administration of Canaan of the 18th Dynasty brought Egyptian stonemasons into Canaan. Prestigious Egyptian words could have displaced native terminology, akin to French terminology in international cuisine. However, it is challenging to explain why stonemasons would apply an *incorrect* Egyptian term when more accurate Egyptian words were available. Why the innovative Egyptian borrowings succeeded in displacing the native Canaanite terms is hard to explain with this hypothesis, especially considering no other part of the Hebrew vocabulary experienced similar displacement by Egyptian vocabulary.

Migration may be the only viable scenario that can explain this semantic shift. Population movement occurred in and out of Egypt throughout antiquity.[3] An Egyptian-born population would be unfamiliar with Canaanite geol-

2 Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin. 69.

3 Bader, Bettina. (2012). *Migration in archaeology: an overview with a focus on ancient Egypt* (pp. 213–226). Springer Vienna.

TABLE 6   Comparison of Egyptian → Hebrew lithonyms displaying seman-
             tic change

Egyptian Donor	Hebrew Reflex	Egyptian Equivalent
bḫn 'greywacke'	*bōḥan* 'basalt'	?
šs 'travertine'	*šayiš ~ šēš* 'limestone'	*ꜣnr ḥḏ* 'limestone'
fkꜣt 'turquoise'	*pūḵ* 'eilatstone'	*wꜣḏ* 'malachite'

ogy. Upon immigrating from Egypt to Canaan, speakers could absorb sub-
strate terminology from the locals, or reapply Egyptian vocabulary to Canaanite
geology. But lacking particular expertise in geology, they reapplied specialized
Egyptian terminology to similar stones. How the innovative Egyptian borrow-
ings succeeded in displacing the native Canaanite terms cannot be determined
given the minute quantity of diachronic data on this issue.

2   Reconsidering the Septuagint and a Potential Pattern

When I began this study, I took as axiomatic the conclusion in *Old Testament
gemstones: A philological, geological, and archaeological assessment of the Sep-
tuagint*[4] that "[m]ost of the translations in later versions of the [Old Testa-
ment], beginning with the Septuagint, are problematic because they are in
some cases based on guesswork, false premises, and/or using stones known in
the translator's day." Therefore, I discarded the ancient translations as reflecting
ancient traditions. However, my analyses in this study, which were intended to
be as independent from the ancient translations as possible, did not bear out
this conclusion.

Contrary to my initial assumption based on the conclusion of Harrell et al.,[5]
the Septuagint's list does not appear to be random at all. Even with several

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4   Harrell, James A. (2011). Old Testament gemstones: A philological, geological, and archaeo-
    logical assessment of the Septuagint. *Bulletin for Biblical Research*, *21*(2), 141–171. Page 45.
5   Harrell, James. A. (2011). Old Testament gemstones: A philological, geological, and archaeo-
    logical assessment of the Septuagint. *Bulletin for Biblical Research*, *21*(2), 141–171.

TABLE 7   A comparison of the Septuagint's translation with etymology-based identifications

Hebrew term + identification	Septuagint's translation	Hebrew term + identification	Septuagint's translation
אֹדֶם carnelian	σάρδιον *sardion* carnelian	לֶשֶׁם amazonite	λιγύριον *ligurion* amber
פִּטְדָה peridot	τοπάζιον *topazion* peridot	שְׁבוֹ agate	ἀχάτης *achates* agate
בָּרֶקֶת green jasper	σμάραγδος *smaragdos* greenstone	אַחְלָמָה red jasper	ἀμέθυστος *amethystos* amethyst
נֹפֶךְ turquoise	ἄνθραξ *anthrax* garnet	תַּרְשִׁישׁ amber	χρυσόλιθος *chrysolithos* peridot
סַפִּיר lapis lazuli	σάπφειρος *sappheiros* lapis lazuli	שֹׁהַם onyx	βηρύλλιον *beryllion* aquamarine
יַהֲלֹם ?	ἴασπις *iaspis* blue chalcedony	יָשְׁפֶה blue chalcedony	ὀνύχιον *onychion* onyx

Colors indicate different metathesis events.

inaccurate translations, the Septuagint's list approaches the original identities, albeit with three probable instances of metathesis. The lists in Josephus' *Jewish War* and *Antiquities of the Jews* contain the same terms but with some metatheses. An unaltered ordering of the list appears to be that in Jerome's *Vulgate*, identical to the Septuagint except with the correct order of *onychinus* in position 11 (corresponding to שֹׁהַם) and *berillus* in position 12 (corresponding to יָשְׁפֶה *yošpē*).

שֹׁהַם *šōham* 'onyx' and יָשְׁפֶה *yošpē* 'blue chalcedony' are the most obvious alteration from the original order preserved in *Antiquities of the Jews* and the *Vulgate*. I would posit a second case of metathesis, which has not previously been identified to my awareness. In the Septuagint, לֶשֶׁם *lešem* 'amazonite' is translated λιγύριον *ligurion* 'amber', whereas תַּרְשִׁישׁ *taršīš* 'amber' is translated χρυσόλιθος *chrysolithos* 'peridot'. Equating תַּרְשִׁישׁ *taršīš* and λιγύριον *ligurion* is a perfect fit, by positing a metathesis, two problematic translations are reduced to one.

It is where the Septuagint deviates from our identifications based on etymology and archeogemology that questions arise. To a Hellenic-era Jew, aquamarine was a very close approximation of blue chalcedony, which explains the translation of βηρύλλιον *beryllion* 'aquamarine' for יָשְׁפֵה *yošp̄e* 'blue chalcedony'. If the metathesis between לֶשֶׁם *lešem* and תַּרְשִׁישׁ *taršīš* is correct, it must be explained why the Septuagint's translators rendered לֶשֶׁם *lešem* 'amazonite' as χρυσόλιθος *chrysolithos* 'peridot'. Peridot, a yellow-green gemstone, is in the same color category as amazonite, a blue-green gemstone. It is doubtful that the translators thought לֶשֶׁם *lešem* was peridot, as they correctly employ τοπάζιον *topazion* 'peridot' for פִּטְדָה *piṭdā*.

Over the last two millennia, scholars attempted to determine if there may be a pattern to the order of the stones on the Priestly Breastplate. *Midrash Rabba Numbers* 2:7 (13th century, but this section appears to predate the redaction) states that the stones correspond to the color of the flags of the twelves tribes of Israel. A creative effort in this direction was spearheaded by Glikman, who attempted to discern a pattern within the names of the stones.[6]

With eleven of the twelve stones identified using the more scientifically anchored methods of historical linguistics and archeogemology, a similarly grounded method may be used to determine whether a pattern existed within the order. Because the identity of the stones and the pattern they form are intimately related, it is important to note that *yāhălōm* יָהֲלֹם still alludes identification. But if a pattern can be identified using the eleven data points available, it may be possible to interpolate the twelfth.

The most obvious place to start is color, but one must not allow modern conceptions bias our analysis. While we can see the same colors as the Israelites, Modern English and Classical Hebrew categorize colors differently. Classical Hebrew had a more limited basic color inventory than Modern English, the same color spectrum described with fewer terms. Red, orange, and probably purple were termed אָדֹם *ʾāḏōm* (R), yellow, green, and blue יֶרֶק *yereḳ* (G), black and dark shades were שָׁחֹר *šāḥōr* (B), and white and other light colors were לָבָן *lāḇān* (W). In addition, we might describe a fifth category of variegated or multicolored stones, בְּרֹם *bərōm* (M) (see Ezekiel 27:24). Within this five-color classification system, the colors of the stones are: RGG, GG[?], GMR, RMG according to the order in Exodus 28:17–20.

An obvious pattern emerges from the sequence. The colors of the fourth row are an inversion of the third, and the colors of the second row could be an inver-

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6   https://glikman.blogspot.com/2016/07/colors-of-hoshen-stones-are-hidden-in.html.

sion of the first if יְהֲלֹם *yāhălōm* is interpolated to be [R]. While the significance of the pattern is not evident, its utility in identifying יְהֲלֹם *yāhălōm* is. The meaning of יְהֲלֹם *yāhălōm* is currently obscure, as is its etymology and usage. Of the red or orange stones available in the Levant in the Late Bronze-Iron Ages, carnelian (אֹדֶם *ʾōḏem*), red jasper (אַחְלָמָה *ʾaḥlāmā*), and amber (תַּרְשִׁישׁ *taršīš*) are already accounted for. Garnet has not been identified with any of the stones on the Priestly Breastplate, but it is already known under two other terms from the books of the Prophets, כַּדְכֹּד *kadkōḏ* and אֶקְדָּח *ʾeḵdāḥ*. While this does not disqualify garnet, it mitigates against it.

In the literature, a common etymology for יְהֲלֹם *yāhălōm* derives it from the root ה-ל-ם *h-l-m* 'to hammer down, strike'. There are two problems with this etymology, semantic (what sort of precious stone would be derived from 'to hammer down, strike'?) and morphological (יְהֲלֹם *yāhălōm* has no viable nominal stem in Hebrew). As explored in *Chapter 17*, Ancient Near Eastern terms for garnet are often derived from the idea of something glowing red hot, like a hot coal or a spark. The act of striking metal with a hammer sends sparks flying. The morphological problem requires even specialer-pleading, but perhaps we may make recourse to a poorly-attested Semitic language for the stem of יְהֲלֹם *yāhălōm* just as with אֶקְדָּח *ʾeḵdāḥ*. Amorite fits the bill.

Evidence from the ancient translations may point in this direction. The Septuagint translated נֹפֶךְ *nōp̄eḵ* as ἄνθραξ *anthrax* 'garnet', despite comparison with cognates which allows the meaning of נֹפֶךְ *nōp̄eḵ* be established as 'turquoise'. Looking at plausible metathesis candidates, it is curious that the Septugaint translated יְהֲלֹם with ἴασπις *iaspis* while ἴασπις *iaspis* would be a more appropriate translation for נֹפֶךְ 'turquoise'. Perhaps the equations נֹפֶךְ *nōp̄eḵ* = ἄνθραξ *anthrax* and יְהֲלֹם *yāhălōm* = ἴασπις *iaspis* are metathesized from נֹפֶךְ *nōp̄eḵ* = ἴασπις *iaspis* and יְהֲלֹם *yāhălōm* = ἄνθραξ *anthrax*. This equation is not extant in any Septuagint or Vulgate manuscript that I know of, however it is paralleled by the Aramaic targums. Like the Greek versions, the Aramaic targums suffer from metathesis in the ordering of the stones. In four out of six versions, the targums translate נֹפֶךְ *nōp̄eḵ* with a reflex of Greek σμάραγδος *smaragdos* (זמרגדין *zmrgdyn, et cetera*). In two of these versions, יְהֲלֹם is translated with the word כדכדנא or כדכודין, which is probably a blend of כַּדְכֹּד *kadkōḏ* with Greek χαλκηδών (the other two Aramaic translations translate with the ghost word סבהלום).

There is an alternative to garnet. The Israelites probably conceived of purple as a kind of "red" (אָדֹם *ʾāḏōm*), as the case among other Semitic-speakers around the same time.[7] There is a purple stone attested at this time whose

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7   Thavapalan, Shiyanthi. (2016). Purple Fabrics and Garments in Akkadian Documents. *Journal of Ancient Near Eastern History*, *3*(2), 163–190.

Hebrew name has not yet been determined: amethyst. Except for Sumerian *saŋ.gil.mud*, all of the Ancient Near Eastern terms for amethyst derive from Egyptian *ḥzmn* 'amethyst'. It should be noted that Egyptian *ḥzmn*-stone is securely identified with amethyst based on Ancient Egyptian inscriptions from the amethyst mines at *Wadi el-Hudi*.[8] Within Egyptian, *ḥzmn* is first attested in the language of the Middle Kingdom, though amethyst was exploited consistently since Pre-Dynastic times.[9] Given that יָהֲלֹם *yāhǎlōm* is not cognate with either word for amethyst, it is particularly tricky to make this connection.

Whether יָהֲלֹם *yāhǎlōm* was originally a term for 'garnet' reapplied to 'amethyst' or simply an early term for garnet is left to speculation. The evidence is not strong enough to confirm this identification. I suspect regular confusion between garnet and amethyst in antiquity, caused by the similar appearance and origin of the stones. Almandine garnets are dark red, sometimes with violet hues. These red-violet garnets are occasionally called "amethystine garnets" in the gem trade. Garnet and amethyst were both mined at Wadi el-Hudi in Egypt.[10] As a result, it may be hard to separate references to amethystine garnet and amethyst in the ancient record.[11] Consequently, the Greek word ἀμέθυστος *amethystos* may have also encompassed amethystine (purple) garnet, which affects how אַחְלָמָה *'aḥlāmā* 'red jasper' became rendered as ἀμέθυστος *amethystos* in the Septuagint.

3   A Theory of the Septuagint

If the Septuagint's translations of the stones of the Priestly Breastplate are mostly correct, then what explains the imprecision evident in some of the chosen translations? I suspect this problem is an issue of perspective on the part of modern scholars. Familiar with gemstones and ancient writings on gemstones, we expect the translators of the Septuagint to have a similar if not greater level of understanding of the subject than us. This is fallacious. There is no reason to believe that the translators were familiar with the cutting-edge scientific

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8   Harris, John Richard. (1958). *Lexicographical studies in ancient Egyptian minerals* (Doctoral dissertation, University of Oxford). Akademie Verlag—Berlin.

9   Hackley, Laurel. (2014). *Amethyst, apotropaia, and the Eye of Re* [Master's Thesis, the American University in Cairo]. AUC Knowledge Fountain.

10   Personal communication with Dr. James A. Harrell, to be published in Harrell, James A. (2023). *Archaeology and Geology of Ancient Egyptian Stones*. Archaeopress.

11   I hope to discuss this in more detail in a forthcoming article.

literature of the Hellenic Age and the precise gemological terminology used therein. The translators of the Septuagint were Tora scholars. Naturalists, they were not.

In the Septuagint, one Hebrew word may be translated by numerous disparate Greek lithonyms, which is unexpected if the identities of the Hebrew gemstones were known to Hellenic-era Jews. This picture is oversimplified. The books of the Septuagint were translated by various hands over time. The classification of gemstones was likely a highly specialized area of knowledge that your average scribe would not be not be familiar with. Who's to blame a scribe for offering an arbitrary translation or transliteration? Likewise, textual updating of the translations was a common occurrence in ancient texts, which may explain some of the metathesis and inconsistency within a single book.

The translators looked for the closest Greek term to the Hebrew word they had in mind. Applying a close—if inexact—Greek term was nothing more than approximation on the part of the translators. Thus, a single explanation can be offered as to why anachronistic minerals such as βηρύλλιον *beryllion* 'aquamarine' are mentioned in the Septuagint. Some of these translations must be approximations of the Hebrew term.

These explanations for some of the irregularities found in the Septuagint lends significant weight to certain theories of the Septuagint's composition. The notion that Jewish sages from Judea translated the Pentateuch into Greek should not be hastily dismissed despite the lateness (and perhaps, suspect nature) of the sources which claim this. Even late texts may preserve authentic traditions.

4   Frontiers for Future Research

Despite my best efforts, this book will not be the last word on the topic of the stones of Classical Hebrew. I attempted to write a comprehensive review of the previous research on this topic while including my own suggestions based on an interdisciplinary method that combines developments in historical linguistics and archeogemology. This book not only elevates the discussion from speculative to scientific, but outlines a method for future scholars to utilize.

Part and parcel of a philological investigation of Classical Hebrew includes an accurate understanding of the cognates in numerous ancient Levantine languages. This book includes the most comprehensive collection of cognates to the lithonyms of Classical Hebrew, yet it is limited in being able to accurately gloss the stones described by these cognates. As specialists in Egyptian, Akkadian, Hittite, Hurrian, Sumerian, Meroeitic, and Old South Arabian

develop a better understanding of the meanings of stones in their respective languages, Classical Hebrew will be a second-order beneficiary. *Bāreḳeṯ* in particular would benefit from this sort of research, as several of its many cognates have been anachronistically translated as "emerald" in the secondary literature.

A better understanding in general of certain ancient languages will open new frontiers in the understanding of loanwords in Classical Hebrew. Hurrian is under-studied, and a treatment of Hurrian borrowings in Classical Hebrew would shed light on the origin and meaning of many words. In the same vein, it would be good to know more about the languages of Ancient Nubia. I have identified two words as probable Nubian borrowings, but a better understanding of these languages will help to determine the exact language(s) of origin and the plausibility of this borrowing hypothesis. Likewise, a better understanding of the lexicon of the languages of modern Turkey such as the Anatolian languages (Hittite, Luwian, and the lesser known languages such as Palaic and Lydian) and Hattic will do much to contribute to this endeavor.

Both the identity and etymology of יָהֲלֹם *yāhălōm* are unclear, though Anatolia would probably be the best place to look. Although not always the most reliable, the ancient translations point to garnet, and therefore Anatolia is the best place to look. It may also appear in Ancient Egyptian one day, or potentially any other language. A plausible identification for יָהֲלֹם *yāhălōm* based on solid evidence is the remaining trophy in the subfield of stones in Classical Hebrew, because it would allow for a completion of the Priestly Breastplate. While I am rather confident that שֹׁהַם *šōham* should be identified as 'onyx', the etymology I offered is creative. Finding this term in an Old South Arabian inscription would be fortuitous to confirming the identification of שֹׁהַם *šōham* with onyx and understanding its etymology.

Because people have continued to be fascinated by the stones of the Priestly Breastplate for the past two millennia, I doubt this will be the last publication on the topic. However, I hope that my contribution has helped to elevate it to the point that the identifications found in this book are mostly (if not entirely) correct. Therefore, I hope this book will aid those who are wise of heart and filled with a spirit of wisdom to correctly recreate the priestly garments, that they may be used soon in our days.

Index of Publications concerning Stones in the Bible

Perhaps for the same reasons that draw people to precious stones, the topic of the stones of the Hebrew Bible (specifically, the Priestly Breastplate) has aroused voluminous scholarly interest. Because so many publications have been written over the years, I endeavored to collect a comprehensive list for use by scholars who will take up this problem once again. Where multiple editions have been published, the earliest has been cited.

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Since the translation of the Septuagint in the 3rd century BCE, scholars have attempted to identify the stones that populate the biblical text. This study rejects the long-standing reliance on ancient translations for identifying biblical stones. Despite the evident contradictions and historical inconsistencies, scholars traditionally presumed these translations to be reliable. By departing from this approach, this volume presents a novel synthesis of comparative linguistics and archeogemological data. Through rigorous analysis of valid cognates, it establishes correlations between Hebrew stone names and their counterparts in ancient languages, corresponding to known mineral species. This methodological shift enables a more accurate identification of stones mentioned in biblical texts, thus recovering their true historical context. The research not only advances our understanding of biblical mineralogy but also provides a fresh perspective on the material culture of the Ancient Levant, offering valuable insights for scholars and laymen, linguists and archaeologists alike.

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