

Old Testament Gemstones: A Philological, Geological, and Archaeological Assessment of the Septuagint

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The earliest witness to the entirety of the Old Testament is the Septuagint (LXX), dating to the third through first centuries B.C., during the Hellenistic period. This was translated into Greek from an earlier and now largely lost version of the Hebrew Bible. After the ca. 315 B.C. book On Stones by the Greek scholar Theophrastus, the LXX has more references to gemstones than any other surviving Hellenistic manuscript. A total of 22 gemstones are mentioned in 55 passages of the LXX. The objective of this study is to determine the geologic identities of these stones based on their descriptions in all available ancient textual sources that are contemporaneous (or nearly so) with the LXX and on the archaeological record of gemstones used in the Eastern Mediterranean/Western Asia region during the first millennium B.C.

Key Words: gemstones, precious stones, Aaron's breastplate, Septuagint, LXX, Old Testament

INTRODUCTION

This study is concerned with the geologic identities of gemstones mentioned in the OT. The term *gemstone* as used here is broadly defined to include all rocks, minerals, and biogenic materials employed for jewelry (beads, pendants, and inlays), engraved cylinder and stamp seals, and other decorative arts (for example, amulets, figurines, and small vessels).

Author's note: I am especially grateful to Prof. V. Max Brown (formerly of the University of Toledo) for an introduction to Aaron's breastplate and his assistance in a survey of breastplate descriptions in English-language Bibles. Thanks are also due to Lisbet Thoresen (formerly of the J. Paul Getty Museum in Malibu, California), who shared her vast knowledge of ancient gemstones with me and also offered many useful comments on an earlier draft of this article.

Much has been written about the OT gemstones, and virtually all of this literature has been concerned solely with the 12 stones of Aaron's priestly breastplate as described in Exod 28:17–20 and also, depending on the OT version, in either Exod 36:17–20 or 39:10–13. The same gemstones appear again in Ezek 28:13, where they are jewels belonging to the king of Tyre. The earliest of these treatises is the so-called 'De Gemmis' of Epiphanius, Bishop of Salamis in Cyprus, written in the fourth century A.D.¹ Subsequently, many other works on biblical gemstones were published, especially in the past century,² but there is little agreement among any of these on the geologic identities of the breastplate gemstones. This confusion is also well manifested by the many contradicting English translations of Exod 28:17–20, as illustrated in table 1. As will be evident below, many of these translations were made without any serious regard for what gemstones were actually meant in the original OT text.

To obtain an improved English translation of not only the breastplate gemstones but also other gemstones mentioned elsewhere in the OT, one must go back to the oldest surviving version of this book. This is the so-called Septuagint, a third- through first-century B.C. Greek translation of an earlier and now largely lost version of the Hebrew Bible.³ The oldest complete manuscript of the Hebrew Bible, the Masoretic Text (MT), was compiled by the Jewish Masorete scholars between the sixth and eleventh centuries A.D.,⁴ but this text is probably not significantly different from the one on which the LXX is based.⁵ However, identifications of the gemstones

1. P. G. Maxwell-Stuart, "Epiphanius on Gemstones," *Journal of Gemmology* 15/8 (1977): 435–44.

2. E. Clapton, *The Precious Stones of the Bible: Descriptive and Symbolical, Being a Treatise on the Breast Plate of the High Priest, and the Foundation of the New Jerusalem with a Brief History of Each Tribe and Each Apostle* (2nd ed.; London: Simpkin-Marshall-Hamilton-Kent, 1899); W. M. F. Petrie, "Precious Stones" in *Dictionary of the Bible* (ed. J. Hastings; New York: Scribners, 1902), 619–21; G. F. Kunz, *The Curious Lore of Precious Stones* (Philadelphia: Lippincott, 1913), 275–306; C. W. Cooper, *The Precious Stones of the Bible with an Account of the Breastplate of the High Priest, the Ephod and Urim, and Thummin* (London: Allenson, 1924); J. S. Harris, "An Introduction to the Study of Personal Ornaments of Precious, Semi-precious and Imitation Stones Used Throughout Biblical History," *The Annual of Leeds University Oriental Society* 4 (1962–63): 49–83; J. S. Harris, "The Stones of the High Priest's Breastplate," *The Annual of Leeds University Oriental Society* 5 (1963–65): 40–62; J. Patrick and G. R. Driver, "Jewels and Precious Stones," in *Dictionary of the Bible* (ed. J. Hastings, F. C. Grant, and H. H. Rowley; New York: Scribners, 1963), 496–500; E. Raymond, *The Gem Stones in the Breastplate* (Muskogee: Artisan, 1987); R. V. Wright and R. L. Chadbourne, *Crystals, Gems and Minerals of the Bible: The Lore and Mystery of the Minerals and Jewels of Scripture from Adamant to Zircon* (New Canaan: Keats, 1988).

3. A. Rahlfs and R. Hanhart, *Septuaginta: Id est Vetus Testamentum Graece iuxta LXX Interpretes* (Stuttgart: Deutsche Bibelgesellschaft, 2006).

4. J. E. Sanderson, "Ancient Texts and Versions of the Old Testament," in *New Interpreter's Bible* (vol. 1; Nashville: Abingdon, 1994) 292–304. I consulted the MT edition of J. Green, ed., *The Interlinear Hebrew/Greek English Bible* (4 vols.; Wilmington: Associated Publishers, 1976) for this study.

5. N. Petersen, "An Analysis of Two Early LXX Manuscripts from Qumran: 4QLXXNum and 4QLXXLev^a in the Light of Previous Studies," *BBR* 19 (2009): 481–510; P. J. Gentry, "The Text of the Old Testament," *JETS* 52 (2009): 19–45.

Table 1. *English-Language Bible Translations of Gemstones in Aaron's Breastplate as Described in Exodus 28:17–20^a*

Row 1, 1st Stone	LXX: σαρδίων or <i>sardion</i> , definitely “carnelian” and “sard” plus possibly “red jasper” Identifications: carnelian or cornelian (6, 7, 11), ruby (4, 5), and sardius or sardion (1–3, 8–10, 12–13)
Row 1, 2nd Stone	LXX: τοπάζο(ς/ν) or <i>topazo(s/n)</i> , definitely “peridot” Identifications: chrysolite (6, 7), and topaz (1–5, 8–13)
Row 1, 3rd Stone	LXX: σμαραγδος or <i>smaragdōs</i> , probably “turquoise” but possibly “malachite” Identifications: beryl (5), carbuncle (1, 3), and emerald (2, 4, 6–13)
Row 2, 1st Stone	LXX: ανθρα(ξ/κα) or <i>anthra(x/ka)</i> , definitely “red garnet” Identifications: carbuncle (8–10, 13), emerald (1, 3), garnet (11, 12), ruby (7), and turquoise (2, 4–6)
Row 2, 2nd Stone	LXX: σαφειρος or <i>sappheiros</i> , definitely “lapis lazuli” Identifications: lapis lazuli (13), and sapphire (1–12)
Row 2, 3rd Stone	LXX: ιασπι(ς/ν) or <i>iaspi(s/n)</i> , probably some form of “green microcrystalline quartz” but possibly “amazonite” Identifications: beryl (11), diamond (1–4, 9, 12), emerald (5), jasper (8, 10, 13), onyx (7), and moonstone (6)
Row 3, 1st Stone	LXX: λιγυριον or <i>ligrion</i> , definitely “amber” Identifications: hyacinth (12), jacinth (2–7, 11), ligure/ligurian/ligurion (1, 8, 10, 13), and opal (9)
Row 3, 2nd Stone	LXX: αχατης or <i>achatēs</i> , definitely “agate” Identifications: agate (1–11, 13), and ruby (12)
Row 3, 3rd Stone	LXX: αμεθυστο(ς/ν) or <i>amethysto(s/n)</i> , definitely “amethyst” Identifications: amethyst (1–13)
Row 4, 1st Stone	LXX: χρυσολιθο(ς/ν) or <i>chrysolitho(s/n)</i> , probably “yellowish chalcedony” Identifications: beryl (1–4, 6, 12), chrysolite (5, 8–11, 13), and topaz (7)
Row 4, 2nd Stone	LXX: βηρυλλιον or <i>bēryllion</i> , probably “aquamarine” Identifications: beryl (7, 8, 13), carnelian (12), and onyx (1–6, 9–11)
Row 4, 3rd Stone	LXX: ονυχιον or <i>onychion</i> , definitely “onyx” including probably “sardonyx” Identifications: beryl (10), jasper (1–7, 9, and 11–12), and onyx (8, 13)

^aEnglish-language Bibles cited in this table are as follows: 1: KJV and Revised Webster Update (1995); 2: NKJV; 3: ASV, ESV, and RSV; 4: NASB; 5: NIV; 6: NLT and NRSV; 7: Bible in Basic English (1949/64); 8: LXX, Brenton Translation (1851); 9: Darby Bible (1889/90); 10: Douay; 11: NAB; 12: NJB; and 13: New English Translation of the Septuagint (2007).

named in the MT are far less certain than those in the LXX. This is true because the ancient Greek and Latin literature (with the Latin gemstone names largely derived from Greek) has much to say about the gemstones mentioned in the LXX, but no comparable literature exists for ancient Hebrew. In order to translate the Hebrew gemstone names, scholars have utilized the root meanings of these names together with, most importantly, what they think to be the equivalent Greek gemstone names in the LXX. However, as will be demonstrated in this article, no such equivalences exist for most of the gemstones. Thus, it is with the gemstones of the LXX that this article is concerned. The meaning of the Hebrew gemstone names in the OT is the subject for another study.

This work differs from all previous studies of OT gemstones in four important respects. First, it considers all LXX passages that mention gemstones and not just those describing Aaron's breastplate (table 2). Second, it consults numerous other ancient texts that are contemporaneous (or nearly so) with the LXX and describe the same gemstones (table 3).⁶ Previous writers have relied almost exclusively on just two ancient sources: Theophrastus's *On Stones* from ca. 315 B.C.,⁷ and Pliny the Elder's Book 37 of his *Natural History* from A.D. 77.⁸ As useful as these texts are, it is both unnecessary and insufficient to rely on them alone. Third, it takes into account the gemstones actually in use in the Eastern Mediterranean/Western Asia region during the first millennium B.C. and especially in the last few

6. Translations of ancient texts listed in table 3 are provided in the following works: Herodotus, *Hist.* (Godley, LCL); Plato, *Phaed.* (Fowler, LCL); Plato, *Tim.* (Bury, LCL); Aristotle, *Mete.* (Lee, LCL); Addaeus of Macedon: W. R. Patton, trans., *The Greek Anthology* (LCL; vol. 3; Cambridge: Harvard University Press, 1917), abbreviated below as "Addaeus, G.A. (Patton, LCL)"; Theophrastus: E. R. Caley and J. F. C. Richards, trans., *Theophrastus: On Stones* (Columbus: Ohio State University, 1956); and D. E. Eichholz, *Theophrastus: De Lapidibus* (Oxford: Clarendon, 1965), abbreviated below as "Theophrastus, O.S. (Caley and Richards or Eichholz)"; Posidippus of Pella: C. Austin and G. Bastianini, trans., *Posidippi Pellaei Quae Supersunt Omnia* (Milan: Edizioni Universitarie di Lettere Economia Diritto, 2002), abbreviated below as "Posidippus, *Lith.* (Austin and Bastianini)"; Agatharchides of Cnidos: S. M. Burstein, *Agatharchides of Cnidos on the Erythraean Sea* (London: Hakluyt, 1989), abbreviated below as "Agatharchides, O.E.S. (Burstein)"; Diodorus Siculus: C. H. Oldfather, trans., *Diodorus of Sicily* (LCL; vol. 2; Cambridge: Harvard University Press, 1961), abbreviated below as "Diodorus, L.H. (Oldfather, LCL)"; Titus Lucretius Carus: W. H. D. Rouse, trans., *Lucretius: De Rerum Natura* (LCL; Cambridge: Harvard University Press, 1959), abbreviated below as "Lucretius, NT. (Rouse, LCL)"; Strabo, *Geogr.* (Jones, LCL); Philo, *Alleg. Interp.* (Colson, LCL); Marcus Manilius of Antioch: G. P. Goold, trans., *Manilius: Astronomica* (LCL; Cambridge: Harvard University Press, 1997), abbreviated below as "Manilius, *Astro.* (Goold, LCL)"; Pliny the Elder, *Nat.* (Eichholz or Rackham, LCL) and S. H. Ball, *A Roman Book on Precious Stones: Including an English Modernization of the 37th Booke of the Historie of the World* by C. Plinius Secundus (Los Angeles: Gemological Institute of America, 1950); Josephus, J.W. (Thackeray, LCL); and Josephus, *Ant.* (Thackeray, LCL); Dioscorides Pedanius: L. Y. Beck, trans., *Pedanius Dioscorides of Anazarbus: De Materia Medica* (Hildesheim: Olms-Weidmann, 2005), abbreviated below as "Dioscorides, *Mat. med.* (Beck)"; and L. Casson, trans., *The Periplus Maris Erythraei* (Princeton: Princeton University Press, 1989), abbreviated below as "P.E.S. (Casson)." Dates for the ancient authors in table 3 are taken from M. Grant, *Greek and Latin Authors 800 B.C.—A.D. 1000* (New York: Wilson, 1980); and M. C. Howatson, ed., *The Oxford Companion to Classical Literature* (2nd ed.; Oxford: Oxford University Press, 1989).

7. Theophrastus, O.S. (Caley and Richards); Theophrastus O.S. (Eichholz).

8. Pliny the Elder, *Nat.* (Eichholz, LCL); Ball, *A Roman Book on Precious Stones.*

centuries corresponding to the Hellenistic period (table 4, p. 170–171). This knowledge will help to rule out otherwise attractive identifications of gemstones that were not available at the time the original texts were composed or when the LXX translation was made. And fourth, it applies rigorous geological criteria to gemstone identification.

This article, therefore, endeavors to integrate philological, geological, and archaeological information to obtain improved translations of the OT gemstones. This is obviously useful for anyone with a scholarly or theological interest in the LXX, but there is another reason the results of this study are important, and it is the primary impetus for my involvement. After Theophrastus's *On Stones*, the LXX has more references to gemstones than any other surviving Hellenistic manuscript. This makes it a highly significant document for geologists, such as myself, as well as for others with an interest in the etymology of rock and mineral names, and the history of gemstone use.

DATE AND CIRCUMSTANCES OF THE SEPTUAGINT

The LXX is known primarily from the Codex Vaticanus and Codex Sinaiticus of the fourth century A.D. and the Codex Alexandrinus of the fifth century A.D. Fragments of the LXX also survive in many other Greek manuscripts, the earliest of which are found among the Dead Sea Scrolls.⁹ None of the latter, however, preserves any of the OT passages with references to gemstones. The most popular and accessible edition of the LXX is that of L. C. L. Brenton, published in 1851,¹⁰ which is based almost entirely on the Codex Vaticanus and includes an English translation along with the original Greek text. A. Rahlfs' 1935 LXX edition,¹¹ which has only the Greek text, is based on all three of the aforementioned codices but especially on the more complete Codex Vaticanus. This has been substantially corrected and revised by R. Hanhart,¹² and it is the Greek text and its versification in this latter edition that I use in this study. There is no difference in the gemstones mentioned in these LXX editions, but some of the passages are numbered differently as noted in table 2.¹³

The most securely dated portion of the LXX is the Pentateuch or Torah (including Genesis, Exodus, Leviticus, Numbers, and Deuteronomy), which was translated into Greek during the early to mid third century B.C.¹⁴

9. K. H. Jobes and M. Silva, *Invitation to the Septuagint* (Grand Rapids: Baker Academic, 2000), 168–71; J. M. Dines, *The Septuagint* (London: T. & T. Clark, 2004), 4–7.

10. L. C. L. Brenton, *The Septuagint with Apocrypha: Greek and English* (London: Bagster, 1851; repr., Peabody, MA: Hendrickson, 1986).

11. A. Rahlfs, *Septuaginta: Id est Vetus Testamentum Graece iuxta LXX Interpretes* (Stuttgart: Württembergische Bibelanstalt, 1935).

12. Rahlfs and Hanhart, *Septuaginta*.

13. It is the versification in Rahlfs and Hanhart (ibid.) that is used in this article but, where different, that of Brenton, *The Septuagint with Apocrypha: Greek and English* is also given in table 2. The versification of some passages in this table differ in the MT and, consequently, also in the English-language Bibles based on the MT.

14. N. Collins, "281 BCE: The Year of the Translation of the Pentateuch into Greek under Ptolemy II," in *Septuagint, Scrolls and Cognate Writings* (ed. G. J. Brooke; Atlanta: Scholars Press,

Table 2. Gemstones in the Septuagint

<i>Breastplate Gemstones</i>	
αχατης or <i>achatēs</i>	Exod 28:19, 36:19; Ezek 28:13
αμεθυστο(ς/ν) or <i>amethysto(s/n)</i>	Exod 28:19, 36:19; Ezek 28:13
ανθρα(ξ/κα) or <i>anthra(x/ka)</i>	Esth 1:7; Exod 28:18, 36:18; Ezek 10:9, 28:13; Gen 2:12; Isa 54:11; Sir 32:5 (35:5 Brenton); Tob 13:17
βηρυλλιον or <i>bēryllion</i>	Exod 28:20, 36:20; Ezek 28:13; Tob 13:17
χρυσολιθο(ς/ν) or <i>chrysolitho(s/n)</i>	Exod 28:20, 36:20; Ezek 28:13
ιασπι(ς/ν) or <i>iaspi(s/n)</i>	Exod 28:18, 36:18; Ezek 28:13; Isa 54:12
λιγυριον or <i>ligyriion</i>	Exod 28:19, 36:19; Ezek 28:13
ονυχιον or <i>onychion</i>	Exod 28:20, 36:20; Ezek 28:13; Job 28:16; Sir 24:15
σαπφειρος or <i>sappheiros</i>	Exod 24:10, 28:18, 36:18; Ezek 1:26, 9:2, 10:1, 28:13; Isa 54:11; Job 28:6, 28:16; Lam 4:7; Song 5:14; Tob 13:17 (13:16 Brenton)
σαρδιον or <i>sardion</i>	Exod 25:7, 28:17, 35:9 (35:8 Brenton), 36:17; Ezek 28:13; Prov 25:11–12
σμαραγδος or <i>smaragdōs</i>	Esth 1:6; Exod 28:9, 28:17, 35:12 (35:13 Brenton), 35:27, 36:13, 36:17; Ezek 28:13; Jdt 10:21; Sir 32:6 (35:6 Brenton); Tob 13:17 (13:16 Brenton)
τοπαζο(ς/ν) or <i>topazo(s/n)</i>	Exod 28:17, 36:17; Ezek 28:13; Job 28:19; Ps 118:127
<i>Other Gemstones</i>	
αδαμα(ς/ντ) or <i>adama(s/nt)</i>	Amos 7:7–8; 4 Macc 16:13
γαβις or <i>gabīs</i>	Job 28:18
ελεφαντιν(ο/ω)ν or <i>elephantinon</i>	Amos 3:15, 6:4; 2 Chr 9:17, 9:21; Ezek 27:6; 1 Kgs 10:18, 22:39; Song 5:14, 7:5
κρυσταλλο(ν/νς) or <i>krystallo(u/n/s)</i>	Isa 54:12; Ezek 1:22
μετεωρα or <i>meteora</i>	Job 28:18
πιννινου or <i>pinninou</i>	Esth 1:6
ὁ λιθος ὁ πρασινος or <i>ho lithos ho prasinos</i>	Gen 2:12
σοομ or <i>soom</i>	1 Chr 29:2
λιθος Σουφιρ or <i>lithos Souphir</i>	Isa 13:12; Tob 13:17
θαρσεις or <i>tharseis</i>	Dan 10:6; Ezek 1:16; Song 5:14
<i>Passages with Nonspecific References to Gemstones</i>	
λιθο(ν/ς) τιμιος or <i>litho(n/s) timios</i> (“precious stones”)	1 Chr 20:2, 29:2; 2 Chr 3:6, 9:10, 32:27; Dan 11:38 (Theodotion version only); 1 Kgs 10:2, 10:10; Ps 18:11 (18:10 Brenton); 2 Sam 12:30
λιθο(ν/ς) εντιμος or <i>litho(n/s) entimos</i> (“precious stones”)	Tob 13:17 (13:16 Brenton)
λιθο(ν/ς) πολυτελ(η/ε)ς or <i>litho(n/s) polyteles</i> (“costly stones”)	1 Chr 29:2; Esth 5:1; Isa 28:16, Job 31:24, Jdt 10:21; Prov 3:15, 8:11; Sir 45:11
λιθος εκλεκτος or <i>lithos eklektos</i> (“choice stones”)	Isa 54:12
λιθον χρηστον or <i>lithon chrēston</i> (“useful stones”)	Ezek 27:22, 28:13

Table 3. *Cited Works by Ancient Authors*

Herodotus, ca. 480/490–425 B.C.:	<i>History (Hist.)</i>
Plato, ca. 427/429–347 B.C.:	<i>Phaedo (Phaed.)</i> ; and <i>Timaeus (Tim.)</i>
Aristotle, 384–322 B.C.:	<i>Meteorology (Mete.)</i>
Addaeus of Macedon, fourth century B.C.:	epigram 9.544 in the <i>Greek Anthology (G.A.)</i> of Stephanus of Philippus, late first century B.C. or early first century A.D.
Theophrastus, a student of Aristotle, ca. 370–287 B.C.:	<i>On Stones (O.S.)</i>
Posidippus of Pella, 315–250 B.C.:	<i>Lithika (Lith.)</i>
Agatharchides of Cnidos, second century B.C.:	<i>On the Erythraean Sea (O.E.S.)</i> , preserved within the ninth century A.D. <i>Library</i> by Photius, Patriarch of Constantinople
Diodorus Siculus, first century B.C.:	<i>Library of History (L.H.)</i>
Titus Lucretius Carus, ca. 100–ca. 50 B.C.:	<i>The Nature of Things (N.T.)</i>
Strabo, ca. 63/64 B.C.–ca. A.D. 21/24:	<i>Geography (Geogr.)</i>
Philo of Alexandria, ca. 30 B.C.–ca. A.D. 45:	<i>Allegorical Interpretation (Alleg. Interp.)</i>
Marcus Manilius of Antioch, late first century B.C.–early first century A.D.:	<i>Astrology (Astro.)</i>
Pliny the Elder, ca. A.D. 23/24–79:	<i>Natural History (Nat.)</i>
Flavius Josephus, A.D. 37–ca. 94:	<i>Jewish War (J.W.)</i> ; and <i>Jewish Antiquities (Ant.)</i>
Dioscorides Pedanius, first century A.D.:	<i>Pharmacology (Mat. med.)</i>
Anonymous, mid-first century A.D.:	<i>Periplus of the Erythraean Sea (P.E.S.)</i>

This dating is well attested by the mid to late-second century B.C. *Letter of Aristeas*,¹⁵ which describes how the translation was undertaken in Alexandria (Egypt) during the reign of King Ptolemy II Philadelphus (285–246 B.C.) and also by several other second- and third-century B.C. texts that reference the Greek Pentateuch.¹⁶ The dating of the other books is less certain but the scholarly consensus is that the LXX was completed by the end of the first century B.C., although it has been argued that Baruch and 3–4 Maccabees were written in the first century A.D. and incorporated into the LXX shortly thereafter.¹⁷ The prologue to the book of Sirach (or Ecclesiasticus), which was written in the late second century B.C. by the grandson of Jesus Ben Sirach, implies that in his time there were already Greek translations for “the

1992), 403–503; Sanderson, “Ancient Texts and Versions,” 292–304 (see pp. 299–302); Jobs and Silva, *Invitation to the Septuagint*, 45; M. Hengel, *The Septuagint as Christian Scripture: Its Prehistory and the Problem of Its Canon* (Edinburgh: T. & T. Clark, 2002), 19; Dines, *The Septuagint*, 41–42; Rahlfs and Hanhart, *Septuaginta*, xxxi.

15. S. Honigman, *The Septuagint and Homeric Scholarship in Alexandria* (London: Routledge, 2003), 2–11; Dines, *The Septuagint*, 27–33.

16. Collins, “281 BCE: The Year of the Translation,” 404–8; Honigman, *The Septuagint and Homeric Scholarship*, 96–97 and 123–29.

17. Hengel, *The Septuagint as Christian Scripture*, 91; Dines, *The Septuagint*, 45–46.

law itself, and the prophets, and the rest of the books,"¹⁸ and so it seems that the LXX was largely completed by this early date. The LXX is, thus, very much a product of the Hellenistic age. It is possible, of course, that the codices of the fourth and fifth centuries A.D. incorporate some post-Hellenistic modifications affecting the gemstones named, but at present there is no reason to think this happened.

The earliest references to gemstones in the LXX come from two first-century A.D. writers, and these support the Hellenistic age of the Pentateuch, at least. Philo of Alexandria (ca. 30 B.C.–ca. A.D. 45), in his *Allegorical Interpretation* (*Alleg. Interp.* 1.81), lists the first five breastplate stones from Exod 28:17–18, and these are identical in both order and kind with the stones listed in the LXX. Additionally, in his discussion of the second book of Genesis, Philo mentions the same two gemstones as the LXX's Gen 2:12: *anthrax* and *ho lithos ho prasinος* (*Alleg. Interp.* 1.79). Flavius Josephus (A.D. 37–ca. 94), the Jewish historian and priest, describes Aaron's breastplate (and also his *epomis* or shoulder brooches) in two of his works, the ca. A.D. 77 *Jewish War* (*J.W.* 5.233–34) and the ca. A.D. 93 *Jewish Antiquities* (*Ant.* 3.165–68). In both accounts, his lists of breastplate gemstones are identical to that in the LXX (Exod 28:17–20 and 36:17–20) with one minor exception: in place of the LXX's *sardion*, Josephus reports *sardonyx* in his *Jewish Antiquities*. Also, the shoulder brooches, in both his works, are carved from *sardonyx* whereas the same brooches in the LXX (Exod 28:9 and 36:13) are of *smaragdos*. The order of the 12 breastplate gemstones differs somewhat in both of his descriptions, and neither of these is the same as the order given in the LXX. The LXX itself is internally consistent with identical lists in Exod 28:17–20 and 36:17–20 and Ezek 28:13. It is possible that the above differences are due to errors on Josephus's part, but it is clear from the agreement among the gemstone lists that he worked from a Hellenistic (or, at least, a first-century A.D.) copy of the LXX, although perhaps one not identical to the versions that now survive. It is highly unlikely that Josephus worked from the Hebrew Torah instead given that his Greek translations of the gemstone names are virtually identical to those of the LXX.

The LXX's lists of gemstones for Aaron's breastplate and the king of Tyre's jewels were almost certainly the inspiration for the 12 foundation stones of Jerusalem in Rev 21:19–20. This book was written in the late first century A.D. with the oldest surviving texts in the aforementioned codices Vaticanus and Sinaiticus. In the latter, for example, the gemstones reported for the first to last foundation stones are: *iaspis*, *sappheiros*, *chalkedon*, *smaragdos*, *sardonyx*, *sardion*, *chrysolithos*, *beryllos*, *topazion*, *chrysoprasos*, *hyakinthos*, and *amethystinos*. Only eight of these gemstones, however, are the same as in the LXX's lists and their order is different.

The LXX was prepared by Jewish scholars working in Alexandria, Egypt, and perhaps elsewhere as well.¹⁹ They were translating books writ-

18. Brenton, *The Septuagint with Apocrypha*, 74 of Apocrypha.

19. Dines, *The Septuagint*, 42.

ten in Hebrew and, to a lesser extent, Aramaic. Those of the Pentateuch were originally composed prior to the Hellenistic period and may have been based on oral traditions dating back to the late second millennium B.C. in Egypt. Many of the other books also date to this earlier time, but others were written during the Hellenistic period with some of these composed in Greek (for example, 2–4 Maccabees and Wisdom of Solomon).²⁰ In the case of the non-Greek books, it cannot be assumed that the translators knew, in all cases, the Greek equivalents of the Hebrew (or Aramaic) gemstone names. 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. Certainly, many of these would have been unknown in earlier centuries. For example, the *topazion Eithiopias* in Job 28:19, one of the LXX's pre-Hellenistic books, can only refer to the peridot from Zabargad Island in the Red Sea (see pp. 163–164 below), which was not mined prior to the second or third century B.C. Job was translated into Greek in the latter half of the second century B.C.,²¹ at a time when peridot would have been a new and interesting addition to the gemstones available to the ancient lapidaries. In a similar manner, other strictly Hellenistic gemstones may have been referenced in the LXX. It is quite possible that the translators consulted Theophrastus's *On Stones*, a copy of which was surely on hand in Alexandria's famed library. Other lapidary texts may also have been available to them, because Theophrastus is only one of 39 authorities on gemstones cited by Pliny the Elder in Book 1 of his *Natural History* (*Nat.* 1.166–67).

The LXX was not considered "Holy Scriptures" prior to the Christian era but rather was intended only to edify, educate, and perhaps entertain Hellenized Jews and thereby strengthen their bond with the Palestinian motherland.²² Under these circumstances, it is not to be expected that the LXX's translators would have agonized over the precise meanings of the Hebrew gemstone names. They were probably content to use Greek names that would be familiar to the LXX's readers without knowing or caring if they were accurate translations.

RELEVANCE OF THE MASORETIC TANAKH

In an effort to strengthen their identifications of the breastplate gemstones in Exod 28:17–20, most writers have mistakenly assumed there is a direct, one-to-one correspondence between the Greek gemstone names in the LXX and the Hebrew names in the MT. With a few exceptions, this correspondence cannot be supported for two reasons. First, as already seen in the comparisons between the descriptions of the breastplate in the LXX and Josephus's two works, there must have been different versions of the LXX

20. Hengel, *The Septuagint as Christian Scripture*, 93.

21. Dines, *The Septuagint*, 46.

22. Hengel, *The Septuagint as Christian Scripture*, 75–103; Dines, *The Septuagint*, 47–61.

by the first century A.D. with different arrangements of the gemstones in Exod 28:17–20 (and also in Exod 36:17–20 LXX = 39:10–13 MT). The question then becomes which, if any, of these versions accurately reflects the original Hebrew Pentateuch on which the MT is based? And second, for a given Greek gemstone name occurring in several LXX passages, the Hebrew names in the corresponding MT passages are commonly not the same. For example, the Greek *smaragdos* in the LXX's Exod 28:9, 35:27, and 36:17 (39:10 in MT) is variously rendered, respectively, *šoham*, *yašpeh*, and *baraqet* in the same MT passages. Similarly for the LXX's *anthra(x/ka)*, the corresponding Hebrew words in the MT are *šoham* in Gen 2:12, *taršiš* in Ezek 10:9, and *nopek* in Isa 54:11. A lack of agreement such as this demonstrates that either the LXX and MT are based on different Hebrew texts or Vorlages, or, much more likely, that the LXX translators often did not know the Greek equivalents of the Hebrew gemstone names. Another indication that the LXX translators detoured from the Hebrew source is provided by Ezek 28:13, which lists 12 gemstones in the LXX but only 9 in the MT. There are, in fact, a great many differences generally between the LXX and MT.²³ Many of the translated books are fairly liberal renderings of the earlier Hebrew sources with texts that are paraphrased, abbreviated, or expanded from what appears in the MT. It, therefore, follows that the MT is generally unreliable as a basis for identifying the LXX gemstones and vice versa. So the gemstone translations of earlier scholars not aware of this and who relied on the MT cannot be trusted. The MT, however, is not without some usefulness in the present study, as will be seen in later sections.

GEMSTONES OF THE FIRST MILLENNIUM B.C.

In considering the meaning of the Greek names for gemstones in the LXX, it is incumbent on modern translators to have a firm understanding of what gemstones were actually in use within the Eastern Mediterranean/Western Asia region when the original Hebrew texts were written and later when the LXX translation was made. It is also necessary to know the geological properties of these gemstones. Table 4 provides this information for the first millennium B.C. The chronological and geographical divisions in the table are called for by the facts that the Hebrew Bible was mostly written in Western Asia in the centuries prior to the Hellenistic period, but the LXX translation was made during the Hellenistic period in Egypt. The gemstones in table 4 are characterized as being either commonly (c) or rarely (r) used, or either not reported or unconfirmed if reported (-). Scholars may quibble over some of these characterizations, which are necessarily subjective and based on limited data, but they do provide a reasonably accurate picture of the relative popularities of the first millennium B.C. gemstones.

23. E. Tov, *The Text-Critical Use of the Septuagint in Biblical Research* (2nd ed.; Jerusalem: Simor, 1997), 46–56; Gentry, "The Text of the Old Testament"; N. Petersen, "An Analysis of Two Early LXX Manuscripts from Qumran."

Archaeological and art historical references are rife with misinformation on ancient gemstones, and this is not surprising given that the writers generally lacked the geological expertise for accurate mineral and rock identifications. Even if they had such expertise, however, they were generally unable to perform the often-destructive diagnostic tests on artifacts. Consequently, much of what has been written about the gemstones used in the Eastern Mediterranean/Western Asia region is unreliable, but there are also some credible (although not infallible) sources of information.²⁴ The information in table 4 is based not only on the cautious use of these sources but also on the present author's examination of ancient gemstones in many museum collections as well as his field research on ancient Egyptian gemstones.²⁵

Prior to the Hellenistic period, colored translucent and opaque gemstones were the ones most commonly used, but following Alexander the Great's eastern conquests in the late fourth century B.C., colored transparent gemstones from India (and Sri Lanka) began flowing into the Mediterranean region. This flow became a torrent by the first century A.D. with the rise of Imperial Rome and its preference for colored transparent gemstones. This development must be kept in mind when using Pliny the

24. For Egypt, the sources are: A. Lucas and J. R. Harris, *Ancient Egyptian Materials and Industries* (4th ed.; London: Arnold, 1962), 386–405; C. Andrews, *Ancient Egyptian Jewelry* (New York: Abrams, 1990), 35–52; B. G. Aston, J. A. Harrell, and I. Shaw, "Stones," in *Ancient Egyptian Materials and Technology* (ed. P. T. Nicholson and I. Shaw; Cambridge: University of Cambridge Press, 2000), 5–77; and T. DePutter and C. Karlshausen, *Les pierres utilisées dans la sculpture et l'architecture de l'Égypte pharaonique: Guide pratique illustré* (Bruxelles: Connaissance de l'Égypte Ancienne, 1992). For the Eastern Mediterranean/Western Asia region, the sources are: G. M. A. Richter, *The Engraved Gems of the Greeks, Etruscans and Romans* (vol. 1; London: Phaidon, 1968), 8–13; R. Higgins, *Greek and Roman Jewelry* (2nd ed.; Berkeley: University of California Press, 1980), 35–39; J. M. Ogden, *Jewelry of the Ancient World* (New York: Rizzoli, 1982), 90–142; D. Colton, "Materials and Techniques of Ancient Near Eastern Cylinder Seals," in *Technology and Analysis of Ancient Gemstones* (ed. T. Hackens and G. Moucharte; Rixensart: PACT, 1989), 11–19 (see 16–17); P. R. S. Moorey, *Ancient Mesopotamian Materials and Industries: The Archaeological Evidence* (Oxford: Clarendon, 1994), 74–103; D. Plantzos, *Hellenistic Engraved Gems* (Oxford: Clarendon, 1999), 36–46 and 113–16; J. Boardman, *Greek Gems and Finger Rings: Early Bronze Age to Late Classical* (London: Thames & Hudson, 1970), 374–77; M. Sax, "The Seal Materials, Their Chronology and Sources," in *Catalogue of the Western Asiatic Seals in the British Museum: Cylinder Seals V, Neo-Assyrian and Neo-Babylonian Periods* (ed. D. Colton; London: British Museum Press, 2002), 18–34; and L. Thoresen, ed., *On Gemstones: Gemological and Analytical Studies of Ancient Intaglios and Cameos* (London: Essential Works, forthcoming).

25. J. A. Harrell, "Geology," in *Berenike 1997: Report of the Excavations at Berenike and the Survey of the Egyptian Eastern Desert, Including Excavations at Shenshef* (ed. S. E. Sidebotham and W. Z. Wendrich; Leiden: Centre for Non-Western Studies, Leiden University, 1999), 107–21; J. A. Harrell, "Archaeological Geology of the World's First Emerald Mine," *Geoscience Canada* 31/2 (2004): 69–76; J. A. Harrell and S. E. Sidebotham, "Wadi Abu Diyeiba: An Amethyst Quarry in Egypt's Eastern Desert," *Minerva* 15/6 (2004): 12–14; J. A. Harrell, S. E. Sidebotham, R. S. Bagnall, S. Marchand, J. E. Gates, and J.-L. Rivard, "The Ptolemaic to Early Roman Amethyst Quarry at Abu Diyeiba in Egypt's Eastern Desert," *Bulletin de l'Institut Français d'Archéologie Orientale* 106 (2006): 127–62; J. A. Harrell and A. F. Osman, "Ancient Amazonite Quarries in the Eastern Desert," *Egyptian Archaeology* 30 (2007): 26–28; J. A. Harrell, "Gemstones," in *Tutankhamun's Footwear: Studies of Ancient Egyptian Footwear* (ed. A. J. Veldmeijer; Norg: DrukWare, 2010): 149–51; J. Harrell and E. Bloxam, "Egypt's Evening Emerald," *Minerva* 21/6 (2010): 18–21.

Elder's *Natural History* from A.D. 77 in identifying the LXX gemstones. The misbelief that all gemstones of Pliny's day were in common use in the preceding centuries or that the gemstone names had unchanging meanings has led astray many writers on LXX gemstones. A good example of this is the almost-universal mistranslation of *smaragdōs* in the LXX and other Hellenistic texts as "emerald" (that is, green beryl) when this gemstone was not generally available until the latter half of the first century B.C., at which time the first Egyptian emerald mine was opened in Wadi Sikait.²⁶ It should be noted, however, that emeralds were definitely being used earlier in the Hellenistic period, but this usage is exceedingly rare and restricted to Macedonia and the Black Sea region, with the source of these early emeralds possibly in Russia's Ural Mountains. Pliny and other Roman writers are often referring to emerald when speaking of *smaragdōs*, but, as will be shown below, the LXX translators had a very different gemstone in mind.

THE SEPTUAGINT GEMSTONES

In 55 passages of the LXX, 22 gemstones are mentioned by name, and non-specific references to gemstones appear in some of the same passages as well as in 16 others (table 2). In the analysis that follows, these gemstones are divided into two groups, the first for those in Aaron's breastplate and the second for all the rest. Within each of these groupings, the gemstones are listed alphabetically by the English transliterations of their Greek names. The spelling of these names is quite variable within the LXX and other Hellenistic texts, and so the orthography employed here represents the most commonly used forms in ancient Greek literature. The proposed gemstone identifications are qualified according to their degree of certainty: definite, probable, or possible. The ancient sources cited include only those that provide information bearing on a gemstone's identity (table 3).

Breastplate Gemstones

ἀχατης or Achatēs, Definitely "Agate"

Although there are only two ancient sources that describe *achatēs*, there is no reason to doubt that it is the modern agate. Theophrastus (O.S. 5.31) says a "handsome stone which fetches a high price is the *achatēs* from the river *Achatēs* in Sicily."²⁷ This river is the modern Drillo (or Dirillo) in the southeast corner of the island. Agate certainly occurs in Sicily but it is not an especially notable source for this stone. Pliny the Elder (*Nat.* 37.54.139–43) says *achatēs* "was first discovered in Sicily near the river of the same name, but was later found in many countries."²⁸ He describes several varieties,

26. Harrell, "Archaeological Geology"; S. E. Sidebotham, H. M. Nouwens, A. M. Hense, and J. A. Harrell, "Preliminary Report on Archaeological Fieldwork at Sikait (Eastern Desert of Egypt) and Environs in 2002–2003," *Sahara* 15 (2004): 7–30.

27. Theophrastus, O.S. (Eichholz), 68–69.

28. Pliny the Elder, *Nat.* (Eichholz, LCL), 276–77.

with different colors and patterns, and observes that it “was once held in high esteem, but now enjoys none.”²⁹ Pliny’s description of *achates* fits only the geological agate, and his statement about its low esteem in his day, in contrast to Theophrastus’s high praise, is especially telling. As pointed out earlier, translucent gemstones like agate fell out of favor in Imperial Rome when colored transparent stones became popular.

αμεθυστο(ς/ν) or Amethysto(s/n), Definitely “Amethyst”

The ancient Greek word *amethystos* means “without drunkenness”³⁰ and was the name given to a gemstone thought either to protect a wearer from drunkenness or to act as a remedy for this condition. Theophrastus (O.S. 5.30–31) describes it as being “transparent . . . [with the] color of red wine . . . [and found] by splitting certain rocks.”³¹ This is an excellent characterization of amethyst, which usually occurs as crystals inside geodes and other rock cavities. The translation “red wine” is misleading because like the modern so-called red wines, those in antiquity probably had a purplish-red color. Pliny the Elder (*Nat.* 37.50.121–24) also mentions the wine color and transparency of *amethystus* and adds that the color is specifically “violet” and that the gem comes from “Egypt” among other countries.³² Egypt is, in fact, the best known of these sources with the Abu Diyeiba mine active in Pliny’s day.³³ Garnet can have a color similar to that of amethyst (see next section below) and undoubtedly the two gemstones were sometimes confused with each other in antiquity. The ancient descriptions of *amethystos*, however, fit only the modern amethyst.

ανθρα(ξ/κα) or Anthra(x/ka), Definitely “Red Garnet”

The ancient Greek word *anthrax* refers to hot, glowing wood embers or charcoal.³⁴ It also has this meaning in some LXX passages such as Ezek 1:13 and 10:2, Isa 54:16, Lev 16:2, and 2 Sam 14:7 as well as in Theophrastus (O.S. 2.12, 7.39). *Anthrax* was additionally the name of a gemstone with a glowing red color similar to that of hot charcoal. Some ancient references mention the “incombustibility” of the *anthrax* gemstone (for example, Theophrastus, O.S. 3.19, 2.12; Aristotle, *Mete.* 4.9.387b.17; Pliny the Elder, *Nat.* 37.25.92), but these should not be misconstrued. They are merely a way of noting that *anthrax* has the appearance of hot charcoal without the necessity of burning. Theophrastus describes *anthrax* as “very rare and small . . . [and] carved into signets” (O.S. 1.8), and also says it has a “red hue and when placed toward the sun produces the color of live charcoal”

29. Ibid.

30. H. G. Liddell and R. Scott, *A Greek-English Lexicon* (Oxford: Clarendon, 1996), 79.

31. Theophrastus, O.S. (Eichholz), 68–69.

32. Pliny the Elder, *Nat.* (Eichholz, LCL), 262–63.

33. Harrell and Sidebotham, “Wadi Abu Diyeiba”; Harrell et al., “The Ptolemaic to Early Roman Amethyst Quarry.”

34. Liddell and Scott, *A Greek-English Lexicon*, 140.

and was one of the “most valuable” gemstones (O.S. 3.18–19).³⁵ He noted a few sources from around the Mediterranean region and, significantly, describes the *anthrax* from Miletus (in western Turkey) as “angular and contains hexagons” (O.S. 3.19).³⁶ This is a fair characterization of garnet crystals, which are spheroids composed of 12 4- to 6-sided facets joined along sharp edges. Pliny the Elder (*Nat.* 37.25.93), who refers to *anthrax* as *carbunculus*, says it has “exceptional brilliance in sunlight, while the best are the amethyst-colored stones, namely those in which the fiery red shade passes at the edge into amethyst-violet.”³⁷ This reference to “brilliance,” which is echoed by Posidippus of Pella’s (*Lith.* 3.1) “shining *anthrax*”³⁸ is surely prompted by garnet’s unusually high refractive index, which causes it to be more reflective (that is, shinier) than most other gemstones.

The term *garnet* refers to a group of six closely related mineral species. Garnets display a broad range of colors, but it is the compositionally gradational almandine and pyrope species that have deep red, purplish-red, and violet colors, and these were the ones principally used in antiquity and referred to as *anthrax*. Although *anthrax* was rare and derived from within the Mediterranean region in Theophrastus’s time, Alexander the Great’s opening of the eastern trade resulted in the importation of *anthrax* from India as noted by later Hellenistic writers (for example, Posidippus of Pella, *Lith.* 8.5; and Strabo, *Geogr.* 15.1.67–69). India is indeed a well-known source of high-quality red garnets.³⁹ The translation of the LXX’s *anthrax* as red garnet is thus secure.

βηρυλλιον or Beryllion, Probably “Aquamarine”

Theophrastus does not mention *beryllion*, but his contemporary Posidippus of Pella (*Lith.* 6.3) refers to “this sparkling little *beryllion*” and describes it as a “cubic stone.”⁴⁰ Another contemporary, Addaeus of Macedon (*G.A.* 9.544) refers to “Indian *beryllon*.” Strabo (*Geogr.* 15.1.69) also says it comes from India, and Diodorus Siculus (*L.H.* 2.52.3) mentions it along with *smaragdū* and notes that both have the same color. Pliny the Elder (*Nat.* 37.20.76–79) provides the best description of this gemstone, his *berullus*, saying that “many people consider the nature of *berullus* to be similar to, if not identical with that of [*smaragdus*]” and then proceeds to describe them as having a “hexagonal shape” and, “for the most highly esteemed” *berullus*, a color like the “pure green of the sea.”⁴¹ He also notes that they are rarely found outside India. As mentioned earlier, one variety of Pliny’s *smaragdus* is definitely “emerald” (green beryl; see pp. 161–163 below) and this is the stone that he is comparing with his *berullus*. *Berullus*/*beryllion* is al-

35. Theophrastus, O.S. (Eichholz), 58–59 and 62–63.

36. *Ibid.*, 62–63.

37. Pliny the Elder, *Nat.* (Eichholz, LCL), 238–39.

38. Posidippus, *Lith.* (Austin and Bastianini), 24–25.

39. D. N. Wadia, *Geology of India* (New Delhi: Tata McGraw-Hill, 1975), 459.

40. Posidippus, *Lith.* (Austin and Bastianini), 26–27.

41. Pliny the Elder, *Nat.* (Eichholz, LCL), 224–25.

most certainly aquamarine, a greenish-blue to blue variety of beryl, from India.⁴² Both color varieties of beryl occur in well-formed hexagonal crystals. Aquamarine was in use during the late Hellenistic period and would have been one of the gemstones, along with red garnet, imported into the Mediterranean region from India. Posidippus' characterization of *beryllion* as a "cubic stone" is certainly incorrect for aquamarine, but perhaps this was just his poetic way of saying it had a well-defined, rectilinear form as indeed beryl crystals have.

χρυσολιθο(ς/ν) or Chrysolitho(s/n), Probably "Yellowish Chalcedony"

The Greek word *chrysolithos* literally means "golden stone." Diodorus Siculus (*L.H.* 2.52.3–4) is apparently the first writer to mention this gemstone, and he notes its golden color and then warns about the "false *chrysos*" (ψευδοχρυσος) produced by heating: this, "we are told, is fabricated by mortal fire, made by man, by dipping the *krystallon* [that is, a crystal] into it" (*L.H.* 2.52.4).⁴³ He seems to be referring here to the well-known process of producing "citrine" (yellowish transparent quartz) by heating amethyst and, if so, this first-century B.C. account is the earliest known for this process. This is where nearly all citrine comes from today and was apparently how it was often made in antiquity. Although Pliny the Elder does not mention the heat-treatment process, he does say (*Nat.* 37.42.126) that *chrysolithus*, a "bright golden transparent stone"⁴⁴ comes from, among other countries, "Ethiopia" (a reference to the desert east of the Nile River beginning in southern Egypt and extending south to modern Ethiopia). There is no known natural citrine in this region, but there was the aforementioned amethyst mine at Abu Diyeiba in Egypt, some of the stones from which might have been heat-treated to make citrine.

The first century A.D. *Periplus of the Erythraean Sea* (*P.E.S.* 39, 49, 56) describes *chrysolithon* as the only Egyptian gemstone exported to India and other eastern regions. Again, this may well be heat-treated amethyst (or "unnatural citrine"). I have previously suggested,⁴⁵ as have others, that the *Periplus's chrysolithos* is the yellowish-green peridot from Zabargad Island in the Red Sea. The only other active gemstone mines in Egypt at this time were the mines for amethyst and emerald. The LXX's *topazos* undoubtedly refers to the peridot (see pp. 163–164 below), but it would not be surprising if others called it *chrysolithos*, given Strabo's description of *topazos* as having a "golden (*chrysoeides*) appearance" (*Geogr.* 16.4.6). It seems unlikely, however, that the LXX's breastplate would include two peridot stones identified by different names, although it is possible that the translators misunderstood what these names referred to.

42. Wadia, *Geology of India*, 458.

43. Diodorus, *L.H.* (Oldfather, LCL), 54–57.

44. Pliny the Elder, *Nat.* (Eichholz, LCL), 266–67.

45. Harrell, "Geology," in *Berenike 1997*, 115–16; Harrell and Bloxam, "Egypt's Evening Emerald," 18.

The above suggests that the LXX's *chrysolithos* could be citrine, either natural or unnatural, but there is no archaeological evidence for this gemstone's use prior to the first century B.C. and well after the LXX's Exodus was translated. Two other yellowish transparent gemstones, zircon (also known as jacinth or hyancith) and topaz (not to be confused with ancient *topazos*), are commonly suggested as candidates for *chrysolithos*. However, most (if not all) of what have been identified as these stones in jewelry is actually citrine and, in any case, they were not among the Hellenistic gemstones. Although there are several other yellowish gemstones, none are known to have been used to any significant extent during the first millennium B.C. Nevertheless, carnelian and "common" chalcedony, both varieties of chalcedonic microcrystalline quartz widely used in antiquity, sometimes have a yellowish tint and so it is probably one of these chalcedonies to which *chrysolithos* refers.

*ἰασπι(ς/ν) or Iaspi(s/n), Probably Some Form of
"Green Microcrystalline Quartz" but Possibly "Amazonite"*

Theophrastus (O.S. 4.23) says *iaspis* was carved for seals and twice mentions it in association with *smaragdōs*, implying that both stones have a bluish or greenish color (O.S. 4.27, 6.35). Posidippus of Pella (*Lith.* 14.1) refers to an engraving on "dark *iaspin*" and Plato (*Phaed.* 110D–E) lists *iaspidas* among "our highly prized stones."⁴⁶ Pliny the Elder (*Nat.* 37.37.115–119) says *iaspis* is "translucent" and has many sources and varieties, with most of these being some shade of blue or especially green. His contemporary, Dioscorides Pedanius (*Mat. med.* 5.142), also describes many varieties of *iaspis* with, again, most either bluish or greenish. Although the ancient descriptions are far from definitive, it is likely that the LXX's *iaspis* is some form of greenish microcrystalline quartz, most likely chalcedony but also possibly jasper. Indeed, the word *jasper* is derived from the ancient *iaspis*. Alternatively, the *iaspis* could be the green to bluish-green "amazonite," which was mined in Egypt during the Hellenistic period and earlier.⁴⁷ This popular variety of microcline feldspar is not elsewhere represented among the LXX's breastplate gemstones and so it would not be surprising if this is the stone to which *iaspis* refers.

λίγυριον or Ligyriorion, Definitely "Amber"

Of all the breastplate gemstones, *ligyriorion* is the one translators have had the most trouble with. Ironically, however, the ancient literature indirectly but consistently indicates that it is "amber" (fossil tree resin). To recognize this, one must first consider another ancient Greek name for amber, *elektron*. The Classical Greeks were well aware of amber's remarkable electrostatic properties. Rubbing a piece of this material with a wool cloth produces a strong negative electrostatic charge, which allows amber to attract and hold light

46. Posidippus, *Lith.* (Austin and Bastianini), 34–35; Plato, *Phaed.* (Fowler, LCL), 378–79.

47. Harrell and Osman, "Ancient Amazonite Quarries in the Eastern Desert."

and positively charged materials such as hair, feathers, and leaves. After contact with the amber, these materials can become negatively charged themselves and then are repelled by the amber. If amber's negative charge is large enough, an electrical spark will visibly jump from it to a positively charged object.

In discussing sources of *anthrakos*, Theophrastus (O.S. 2.16) says it is "found in Liguria, where *elektron* also exists."⁴⁸ The ancient region of Liguria was in southern maritime Gaul and extended from the Apennine Mountains of Spain in the west to the Italian Alps in the east. In O.S. 5.29, Theophrastus again discusses Liguria and says that here *elektron* is "dug from the earth" and has a "power of attraction."⁴⁹ He clearly confounds *elektron* with another stone he calls *λυγγουριον* or *lyngurion*, saying the latter is "carved into signets and is as hard as any stone, [and] has an unusual power. For it attracts other objects just as *elektron* does."⁵⁰ Whereas Theophrastus considers *elektron* a true stone, he says, fancifully, that *lyngurion* is just hardened lynx urine (O.S. 5.28–29). It cannot be a coincidence that if one of the *gammas* is removed from *λυγγουριον*, the word becomes *lygurion*, a variant of *λυγουριον* (*ligyurion*). It is certainly possible that the second *gamma* in *λυγγουριον* is the result of an ancient transcription error when the word meant was actually *λυγουριον*. In discussing what commodities the people of Liguria trade in, Strabo (*Geogr.* 4.6.2) says "they also have in their country excessive quantities of *lingurion* (*λυγγουριον*), which by some is called *elektron*."⁵¹ Herodotus (*Hist.* 3.115) says *elektron* comes from the "northern sea," which must be the Baltic Sea with its well-known amber deposits.⁵² There are no known (or, at least, notable) amber deposits in Liguria, but it is to be expected that Baltic amber would be traded through this region to the rest of the Mediterranean world. Indeed, Strabo (*Geogr.* 4.5.3) says the Greeks acquired their *linguria* through trade with the Celts.

Pliny the Elder (*Nat.* 37.11.30–46) speaks at length about amber, which he calls *sucinum* but says it was known to the Greeks as *electrum* (his spelling) and *lyncurium*. He also repeats the earlier claims of Liguria and the "northern sea" as sources. There are still other ancient references to the sources and attractive powers of *elektron* and *lyngurion* (for example, Plato, *Tim.* 80C; and Dioscorides Pedanius, *Mat. med.* 1.83, 2.81). Some Bible translators, who failed to recognize the connection between amber and the LXX's *ligyurion*, have misidentified this gemstone as yellowish or brownish zircon (jacinth or hyacinth) or tourmaline. However, given that these two gemstones were not used in Hellenistic times whereas amber was, there is no reason to doubt that *ligyurion* is amber.

48. Theophrastus, O.S. (Eichholz), 62–63.

49. *Ibid.*, 68–69.

50. *Ibid.*, 66–67.

51. Strabo, *Geogr.* 2 (Jones, LCL), 266–67.

52. Herodotus, *Hist.* (Godley, LCL), 140–43. P. C. Rice, *Amber: The Golden Gem of the Ages* (New York: Van Nostrand Reinhold, 1980), 4–11 and 27–51.

The term *elektru*, a variant of *elektron*, does appear in the LXX in Ezekiel 1:4, 1:27, and 8:2 and is typically translated in English-language Bibles as “amber.” This is very unlikely to be the actual meaning, however. In all three passages of Ezekiel, *elektru* is used in the description of a fiery, spectral apparition and in this context it makes no sense to say it has the appearance of amber. It is more likely that *elektru* refers here to lightning, which can be likened to the electrical discharges (sparks) produced by amber when it acquires a strong electrostatic charge.

ovvχιον or Onychion, Definitely
“Onyx,” Including Probably “Sardonyx”

Theophrastus (O.S. 5.31) says *onychion* is “mixed in color, white and dark alternating,”⁵³ and Pliny the Elder describes it in similar terms (Nat. 37.24.91) saying “*onychem* has several bands of different colors combined with others that are milk-white.”⁵⁴ The ancient Greek word *onyx* means “fingernail” and it is the white outer edge (the “lunula”) of fingernails that resembles the white bands in the gemstone as noted by Pliny (Nat. 37.24.90). The only possible translations for this gemstone are “onyx” or “agate,” two closely related forms of translucent, microcrystalline quartz with the only difference between them being that the parallel laminations in onyx are straight whereas those in agate are curved to wavy. It was only the onyx, however, that was used for cameo relief carvings during the Hellenistic and Roman periods, and so this hugely popular gemstone would have been distinguished from agate, which was almost certainly known as *achates* as discussed above. *Onychion* must have included “sardonyx,” which is the same material as onyx except that in place of the latter’s alternating white and dark gray or black layers, sardonyx has white alternating with reddish or brownish layers. Pliny the Elder (Nat. 37.24.90) recognized this close relationship in his contrasting of *onychis* and *sardonyches*. Sardonyx was widely used throughout the first millennium for beads and seals and was especially popular for cameos during the Greco-Roman period. As far as is known, it is only in the Imperial Roman period that a distinction was made between onyx and sardonyx, with Pliny the Elder’s account being the earliest (Nat. 37.24.86–91).

The identification of *onychion* with onyx and sardonyx is further secured by the fact that India was a major source of these gemstones during the Roman period as reported by Pliny the Elder (Nat. 37.24.90–91) and P.E.S. 48–49, and presumably this was also true in Hellenistic times. Additional support for this comes from the numerous onyx and sardonyx cameo blanks recovered from excavations of the ancient port of Berenike on Egypt’s Red Sea coast, through which much of the Indian trade passed

53. Theophrastus, O.S. (Eichholz), 68–69.

54. Pliny the Elder, Nat. (Eichholz, LCL), 236–37.

on its way into the Hellenistic Ptolemaic Kingdom and subsequently into the Roman Empire.⁵⁵

σαφειρος or *Sappheiros*, *Definitely "Lapis Lazuli"*

Contrary to the almost universal OT translation of *sappheiros* as "sapphire" (blue corundum), it is certain that the ancient gemstone is the modern lapis lazuli, which was one of the most prized gemstones in the Eastern Mediterranean/Western Asia region during the first millennium B.C. The name *sapphire* is clearly derived from *sappheros*, but when the modern, geologic definition of sapphire was coined a few centuries ago, the ancient meaning of *sappheiros* had been forgotten apart from the fact that it referred to a blue stone. Lapis lazuli is an ancient-sounding name, but it is another modern invention. It derives from the medieval Arabic (and earlier Persian) name for this stone, *lazivard*.

Lapis lazuli is technically a rock rather than a mineral and consists of dark blue lazurite with common golden specks of pyrite and white patches and veins of calcite. It is the rock's unique appearance that makes the translation of *sappheiros* so definite. There are numerous ancient descriptions of *sappheiros*. Some simply note its blue color and/or its golden specks (Job 28:6; Theophrastus, *O.S.* 4.23 and 6.37; Pliny the Elder, *Nat.* 33.21.68, 37.38.119, 37.39.119–20 and 37.54.139), whereas others poetically liken its appearance to the "firmament of heaven," that is, a star-studded sky (Exod 24:10 and Ezek 10:1). Posidippus (*Lith.* 5.1–2) and Pliny the Elder (*Nat.* 37.38.119) say *sappheiros* comes from Persia, and *P.E.S.* 39 reports that it was imported into Egypt from India. The only known source of lapis lazuli for the Eastern Mediterranean/Western Asia region is in northeast Afghanistan,⁵⁶ and this stone would have been traded through Persia and India.

In the eight LXX passages where *sappheiros* is mentioned either alone or with only one other gemstone (Exod 24:10; Job 28:6, 28:16 LXX = 28:17 MT; Ezek 1:26, 10:1; Isa 54:11; Lam 4:7; Song 5:14), the corresponding Hebrew word in the MT is always *s-p-r* or, with vowels added, *sapir*. The same agreement is seen again in the passages where Aaron's breastplate is described (Exod 28:18, 36:18 LXX = 39:12 MT) with the middle stone in the second row consistently given as *sappheiros/sapir*. This correspondence fails only for the king of Tyre's jewels in Ezek 28:13, a passage that differs

55. J. A. Harrell, "Geology," in *Berenike 1996: Report of the Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert* (ed. S. E. Sidebotham and W. Z. Wendrich; Leiden: Centre for Non-Western Studies–Leiden University, 1998), 121–48 (see p. 144); J. A. Harrell, "Geology," in *Berenike 1999/2000: Report on the Excavations at Berenike, Including Excavations in Wadi Kalalat and Siket, and the Survey of the Mons Smaragdus Region* (ed. S. E. Sidebotham and W. Z. Wendrich; Los Angeles: Cotsen Institute of Archaeology–University of California at Los Angeles, 2007), 166–74 (see pp. 170–71).

56. G. Herrmann, "Lapis Lazuli: The Early Phases of Its Trade," *Iraq* 30 (1968): 21–57; L. von Rosen, *Lapis Lazuli in Geological Contexts and in Ancient Written Sources* (Partille: Åström, 1988); idem, *Lapis Lazuli in Archaeological Contexts* (Jonsered: Åström, 1990); J. Wyart, P. Bariand, and J. Filippi, "Lapis Lazuli from Sar-E-Sang, Badakhshan, Afghanistan," *Gems and Gemology* 17/4 (1981): 184–90.

radically in other respects between the LXX and MT. The Greek *sapphiros* is clearly derived from the Semitic *sapir*, and so it is not surprising that the LXX's translators correctly identified this gemstone.

σάρδιον or Sardion, Definitely
 "Carnelian" and "Sard" and Possibly "Red Jasper"

Throughout the first millennium B.C. and into the Imperial Roman period, the most commonly used gemstones are what today are known as "carnelian" (also spelled *cornelian* based on a different etymology) and "sard." These are the same stones (microcrystalline, translucent chalcedonic quartz) but with gradational colors, reddish for carnelian and brownish for sard. Note that these color assignments are sometimes reversed in the gemological literature of the 19th and early 20th centuries. The ancient *sardion* must have been primarily carnelian, because this is the color variety almost always seen in ancient jewelry. The reddish-brown variety of sard was also used to some extent and surely would have been included under the name *sardion*. Although no Classical text mentions it, the modern practice of heat treating carnelian to intensify its color⁵⁷ might have been known in antiquity because Diodorus Siculus (*L.H.* 2.52.3–4) seems to have understood the use of heat treatment in creating citrine from amethyst.

The red variety of jasper (microcrystalline, opaque nonchalcedonic quartz) was also widely used during the first millennium B.C., although not to the same extent as carnelian, and may have been considered a variety of *sardion* as suggested by the following texts. Theophrastus describes *sardion* as a rare stone (*O.S.* 1.8) used for seals (*O.S.* 4.23) and found "by splitting certain rocks . . . [where the] transparent, ruddier [that is, reddish] kind is known as the female while the transparent but darker variety is known as the male" (*O.S.* 5.30).⁵⁸ In his description of the varieties of *sarda*, Pliny the Elder says (*Nat.* 37.31.105–6) they are all reddish stones that vary from "translucent . . . [to] somewhat opaque" and that there are "male and female stones, of which the former shine the more intensely, while the latter are less lively and have a dull luster."⁵⁹ Although the two descriptions appear to be contradictory, both seem to be making a distinction between carnelian/sard (perhaps Theophrastus's "female" and Pliny's "male") and red jasper. In two other earlier references to this gemstone, Plato (*Phaed.* 110D–E) describes *sardia* as one of "our highly prized stones"⁶⁰ and Posidippus (*Lith.* 8.1–6) contrasts *sardion* with *anthrakas Indus* (that is, Indian red garnet), saying "it defeats the *anthrakas Indus*, when put to the test, with radiant beams of equal strength."⁶¹ These are apparently references to the best quality carnelian, which has an intense red color not unlike some

57. K. Nassau, *Gemstone Enhancement: History, Science and State of the Art* (Oxford: Butterworth and Heinemann, 1994), 28.

58. Theophrastus, *O.S.* (Eichholz), 68–69.

59. Pliny the Elder, *Nat.* (Eichholz, LCL), 250–51.

60. Plato, *Phaed.* (Fowler, LCL), 378–79.

61. Posidippus, *Lith.* (Austin and Bastianini), 28–29.

garnets. As Pliny the Elder relates, the “fiery red gemstone [*sarda*]” (*Nat.* 37.24.91)⁶² gets its name from the city of *Sardis* in ancient Lydia (western Turkey), where it was first found (*Nat.* 37.31.105). Ironically, although *Sardis* was famously associated with alluvial gold in antiquity, apart from Pliny’s claim, it is not known as a source of carnelian, sard, or red jasper. Consistent with the archaeological record for carnelian/sard/jasper, Pliny asserts that “in ancient times no gemstone was more commonly used than [*sarda*]” (*Nat.* 37.31.106).⁶³

σμαραγδος or *Smaragdos*,

Probably “Turquoise” but Possibly “Malachite”

Theophrastus has much to say about *smaragdos*, which from his descriptions represents a group of bluish and greenish stones. He says these “have the power of communicating their color to water” (*O.S.* 1.4).⁶⁴ He repeats this claim in *O.S.* 4.23 and adds that *smaragdos* “is good for the eyes,”⁶⁵ implying that the stone has a cool, soothing color. In *O.S.* 1.8, Theophrastus includes *smaragdos* in a list of “small . . . rare” stones,⁶⁶ and elsewhere he describes it as one of the stones used for seals (*O.S.* 4.23). Plato (*Phaed.* 110D–E) remarks that it is one of “our highly prized stones.”⁶⁷ In *O.S.* 4.24, Theophrastus implies that a large block of *smaragdos*, measuring 4 by 3 cubits (a cubit being the length of a forearm from the elbow to the fingertips), was sent by the king of Babylon to the king of Egypt, and another even larger piece was used for an obelisk 40 cubits high. This last passage obviously cannot refer to emerald (green beryl) crystals to which the name *smaragdos* is also applied beginning in the late first century B.C. Further, *smaragdos* does not fit any other kind of gemstone with the exception of malachite, which alone can be obtained in large blocks, although not nearly as big as those fancifully described by Theophrastus.

It is in *O.S.* 4.25–27 that the true nature of the Hellenistic *smaragdos* becomes clear. In *O.S.* 4.25, Theophrastus discusses the different sources of this stone, including most prominently the copper mines on *Cyprus* and on the island of Demonesus opposite Chalcedon, where it occurs in “numerous veins [and] is mined under the same conditions as the rest of the [copper-bearing] minerals.”⁶⁸ He continues his discussion of *smaragdos* in the next passage (*O.S.* 4.26–27),⁶⁹ saying “only a few of the stones found attain the size of a signet. The majority are smaller and are consequently used for soldering gold, which the [*smaragdos*] solders as effectively as does *chrysokolla*. Some people, indeed, assume that the two are identical

62. Pliny the Elder, *Nat.* (Eichholz, LCL), 236–39.

63. *Ibid.*, 250–51.

64. Theophrastus, *O.S.* (Eichholz), 58–59.

65. *Ibid.*, 64–65.

66. *Ibid.*, 58–59.

67. Plato, *Phaed.* (Fowler, LCL), 378–79.

68. Theophrastus, *O.S.* (Eichholz), 66–67.

69. *Ibid.*

in nature. Incidentally, they are identical in color. . . . There is a method of working the [*smaragdus*] so as to achieve brilliance. If it is unworked, it is dull." Nowhere does Theophrastus specifically state the color of *smaragdus*, but he strongly implies that it is either green or blue or a combination of the two. He is typical of the Classical Greek writers who were notoriously ambiguous in their references to these two colors. Theophrastus's *smaragdus* is clearly associated with copper deposits where the copper-bearing minerals are always blue or green. The most common of these minerals are turquoise (sky blue, greenish-blue, bluish-green, or green), malachite (banded light and dark green), chrysocolla (green, blue or bluish-green, and the same material as the ancient *chrysokolla*), and azurite (dark blue). All these minerals except turquoise have a Mohs scratch hardness (MH) of less than 4, and so their relative softness makes them less suitable for seals and some jewelry, although malachite was certainly occasionally used for beads and inlays. The much harder turquoise (MH = 5–6) was the signature gemstone of the Eastern Mediterranean region. It came from mines in the Sinai Peninsula of Egypt⁷⁰ and was widely used for jewelry from the third millennium B.C. onward. Malachite, which was the principal ore mineral for copper, also came from the Sinai as well as from ancient mines in southern Israel and Jordan and Egypt's Eastern Desert. Malachite was likewise used from earliest times for jewelry but much more sparingly than turquoise. Given these facts, it would be very surprising if the writers of the Hebrew Bible or the LXX translators had not referred to turquoise at least. Thus, the *smaragdus* of the LXX and Theophrastus is probably turquoise but possibly also malachite. They are both opaque with a dull luster unless, as Theophrastus points out (O.S. 4.27), they are "worked" (that is, polished).

Diodorus Siculus (L.H. 2.52.3) says *smaragdus* and *beryllia* both come from copper mines, but this seems to be a confusion on his part between the earlier meaning of *smaragdus* and the newer one first introduced in his day for emerald (green beryl), which Pliny the Elder a century later closely links with his *berullis* (Nat. 37.20.76). Diodorus's contemporary Strabo (Geogr. 17.1.45) similarly says *smaragdus* and *berullos* occur together but in gold mines. He also makes the earliest mention of the *smaragdus* mines in Egypt near the ancient Red Sea port of Berenike. As previously indicated, these mines first opened in the late first century B.C.⁷¹ and were the principal source of emeralds for the Mediterranean region. Pliny the Elder's *smaragdus* includes several very different kinds of green stones, including Egyptian emerald (Nat. 37.17.65) but also those associated with copper mines on Cyprus and near Chalcedon (Nat. 37.17.66, 37.18.72, 37.19.74). In

70. R. Giveon, *The Stones of Sinai Speak* (Tokyo: Gakuseisha, 1978), 55–135; B. Rothenberg, *Sinai: Pharaohs, Miners, Pilgrims and Soldiers* (New York: Binns, 1979), 137–71; M. Chartier-Raymond, B. Gratien, C. Traunecker, and J.-M. Vincon, "Les sites miniers pharaoniques du Sud-Sinaï: Quelques notes et observations de terrain," *Cashiers de Recherche de l'Institut de Papyrologie et Egyptologie de Lille* 16 (1994): 31–80.

71. Harrell, "Archaeological Geology"; Sidebotham et al., "Preliminary Report on Archaeological Fieldwork."

discussing his *callaina* (almost certainly turquoise), Pliny says some varieties of this stone have the color of *smaragdi* (*Nat.* 37.33.111–12).

τοπαζο(ς/ν) or Topazo(s/n), Definitely “Peridot”

The earliest reference to the gemstone *topazos* dates to the late second century B.C. and comes from Agatharchides of Cnides (*O.E.S.* 5.84) with his account also paraphrased by both Diodorus Siculus (*L.H.* 3.39.3–9) and Strabo (*Geogr.* 16.4.6). Agatharchides says *topazos* comes from the Red Sea island of *Ophiodes* and describes it as a “delightful transparent stone, similar to glass, and with a wonderful golden appearance.”⁷² The only other Hellenistic reference to this gemstone with geographic information is in the LXX’s Job 28:19, which lists *topazion Eithiopias* among other gemstones as being of less value than wisdom. Ancient “Ethiopia,” as previously mentioned, included Egypt’s Eastern Desert and, by extension, the islands off its Red Sea coast. Pliny the Elder (*Nat.* 37.9.24, 37.32.107–8) repeated what earlier writers said about *topazos* but refers to the Red Sea island by the name of *Topazum*. The island’s name, and consequently that of the gemstone, he asserts (*Nat.* 37.32.108) comes from the language of the people living along the Red Sea coast (his “Troglodytes”), and has the meaning of “to seek . . . [because] the island is fogbound; consequently sailors have to search for it.”⁷³ Alternatively, and more likely, the name derives in some way from the Classical Greek word *τοπαζ(ω/ειν) or topaz(o/in)*, meaning “to guess” or “divine.”⁷⁴ Pliny (*Nat.* 37.32.109) describes the stone as having a color that “resembles the tints of the leek [that is, a type of onion]” and comes in two varieties, *prasoides* (“leek-like”) and *chrysopteron* (“golden-feathered”), and is “the largest of gemstones . . . [and is] the only precious stone that is affected by an iron file . . . [and] is worn away by use.”⁷⁵

The ancient *topazos* can only be “peridot” (gem-quality olivine, which was formerly referred to by the now-unused name *chrysolite*) with the sole known ancient source the island of Zabargad or St. John in the Red Sea,⁷⁶ 50 km off the southern coast of Egypt and opposite the Ptolemaic-Roman port city of Berenike. Peridot has a yellowish-green color, and, with a Mohs hardness of 6.5–7 is, as Pliny says, just soft enough to be scratched with an iron file (which can mark a stone with MH of 6.5) unlike most of the other ancient gemstones, which have a hardness of 7 or greater. Crystals up to 20 cm across have been collected from Zabargad Island in modern times, and so peridot does indeed occur in larger crystals than most other gemstones common in Pliny’s day. Consistent with Agatharchides’

72. Agatharchides, *O.E.S.* (Burstein), 139.

73. Pliny the Elder, *Nat.* (Eichholz, LCL), 250–53.

74. Liddell and Scott, *A Greek-English Lexicon*, 1805.

75. Pliny the Elder, *Nat.* (Eichholz, LCL), 252–53.

76. F. W. Moon, *Preliminary Geological Report on Saint John’s Island (Red Sea)* (Cairo: Survey of Egypt, 1923); E. Gübelin, “Zabargad: The Ancient Peridot Island in the Red Sea,” *Gems and Gemology* 17/1 (1981): 2–8; P. C. Keller, *Gemstones and Their Origins* (New York: Reinhold, 1990), 119–27; Harrell and Bloxam, “Egypt’s Evening Emerald.”

description, peridot has an unusually high refractive index and so exhibits a glass-like shininess, but also it has the color of ancient glass which tended to be yellowish green when not intentionally colored. The modern topaz ($\text{Al}_2\text{SiO}_4[\text{F},\text{OH}]_2$) is a very different mineral from olivine and was given its name in the 18th century when it was mistakenly thought to be the ancient *topazos*.

Other Old Testament Gemstones

ἀδάμα(ς/ντ) or Adama(s/nt), Probably Not a Gemstone but a "Platinoid Metal" in Gold

Adamant is only mentioned in the LXX in Amos 7:7–8 and 4 Macc 16:13 but not in the sense of a gemstone. Despite this, some English-language Bibles have translated it as "diamond." Readers will inevitably think of the faceted and polished (and, hence, brilliantly reflective) diamonds of modern-day jewelry. In antiquity, however, diamond could not be worked in this way and so was employed only for engraving hard gemstones and probably also glass. The only possible source of diamond for the Eastern Mediterranean/Western Asia region was India,⁷⁷ but there is no evidence that it was imported prior to the first century A.D. Pliny the Elder's description of one variety of *adamas* (*Nat.* 37.15.56) fits with both diamond and colorless corundum. With their respective Mohs hardnesses of 10 and 9, these are the two hardest naturally occurring materials on Earth. It was one or both of these minerals that Pliny (*Nat.* 37.15.56) and *P.E.S.* 56 reported as imports from India.

Pliny also recognized another variety of *adamas* (*Nat.* 37.15.55), saying this "was the name given to the 'knot of gold' found very occasionally in mines in association with gold and, so it seemed, formed only in gold."⁷⁸ It is this latter variety of *adamas* to which all earlier writers refer. For example, Plato (*Tim.* 59B, *Phaed.* 303D–E) and Manilius of Antioch (*Astro.* 4.926) describe its association with gold and its great hardness, Theophrastus (*O.S.* 3.19) says it is "incombustible," and Titus Lucretius Carus (*N.T.* 2.446–48) refers to its extreme hardness. From these descriptions, it is evident that the *adamas* of Hellenistic period was the typically small grains of platinoid metals (mainly an alloy of osmium and iridium) that occur naturally in many gold deposits.⁷⁹ These grains could not be melted in furnaces then available and were so hard that, in the words of Titus Lucretius Carus, they were "accustomed to despise blows [of the hammer]" (*N.T.* 2.447–49).⁸⁰ This made *adamas* a considerable nuisance to gold workers and well known to all as an intractably hard material. The references to *adamas* in the LXX are thus either to the platinoid metal found in gold or, more generally, to something tremendously hard and unyielding. In the case of 4 Macc 16:13,

77. Wadia, *Geology of India*, 455–56.

78. Pliny the Elder, *Nat.* (Eichholz, LCL), 206–7.

79. J. M. Ogden, "Platinum Group Metal Inclusions in Ancient Gold Artifacts," *Historical Metallurgy* 11/2 (1977): 53–73.

80. Lucretius, *N.T.* (Rouse, LCL), 116–17.

however, if this book dates to the first century A.D. as has been suggested,⁸¹ *adamas* could also refer to diamond or colorless corundum.

ελεφαντιν(ο/ω)ν or Elephantinon, *Definitely "Ivory"*

Besides the passages in the LXX depicting *elephantinon* as a kind of gemstone (table 2), there are others in which it is a precious material used for a tablet (Song 5:14), thrones (1 Kgs 10:18, 2 Chr 9:17), houses (1 Kgs 22:39, Amos 3:15), a tower (Song 7:5), a bed (Amos 6:4), and utensils (Ezek 27:6). From all these applications as well as the name, it is clear that *elephantinon* is ivory from elephants (and probably also hippopotami). This identification is also consistent with 2 Chr 9:21, which lists it as one of the trade items coming from Tharsis (see pp. 167–168 below) along with apes, gold, and silver. The implication of this passage is that *elephantinon* comes from an African or, at least, a distant southern source.

γαβις or Gabis, *an Unknown Stone;*
and μετεωρα or Meteora, *Possibly "Coral"*

The terms *gabis* and *meteora* appear only once in the LXX, in Job 28:18, where along with three gemstones (*onychion*, *sappheiros*, and *topazion*) they are said to have less value than wisdom. It is evident that *gabis* is merely a transliteration of the original Hebrew word, which in the MT for the same passage, is *g-b-š* or *gabiš*. The LXX translator apparently did not know its Greek equivalent and, consequently, its meaning is uncertain. It is not one of the Hebrew names in the MT corresponding to the gemstones in the LXX passages in table 2, and so *gabiš* may not be a gemstone at all but may be some other type of valuable material. *Gabiš* is the root of the MT's *ʔ-l-g-b-š* or *elgabiš*, meaning "hail stones" in Ezek 13:11, 13:13, and 38:22, and so it seems some kind of stone is meant. Some translators have suggested "rock crystal" because of its resemblance to the ice in hail, but in the only MT passage where the Hebrew word clearly correlates with the LXX's *lithos krystallon* (Isa 54:12), the gemstone named is *ʔ-l-d-h* or *oledah* rather than *gabiš*. Strabo (*Geogr.* 5.3.11) mentions a "stone of *Gabii*," but from his comment (*Geogr.* 5.3.10) about a "rock quarry" near the Latium city of *Gabii* that supplied Rome, it seems he was referring to some kind of building or ornamental stone.⁸²

Meteora, in contrast, is a Greek word with the general meaning of "raised" or "elevated from the ground."⁸³ L. C. L. Brenton⁸⁴ translates it as "coral," presumably because coral reefs rise from the sea floor, and this seems reasonable given that the reference in Job 28:18 is to a precious material, but this translation is far from definitive.

81. Hengel, *The Septuagint as Christian Scripture*, 91.

82. Strabo, *Geogr.* 2 (Jones, LCL), 414–17.

83. Liddell and Scott, *A Greek-English Lexicon*, 1120.

84. Brenton, *The Septuagint with Apocrypha*.

κρυσταλλο(υ/ν/ς) or Krystallo(u/n/s),
Definitely Colorless "Quartz (Rock) Crystal"

Krystallos is the ancient Greek word for ice and appears in the LXX with this meaning (e.g., Num 11:7; Job 6:16; Pss 147:6, 148:8; Sir 43:20; Wis 16:22). It was also applied to the similar-looking (colorless and transparent) variety of quartz known as "rock crystal," which commonly appears as well-formed, hexagonal crystals in rock cavities just as amethyst does. *Krystallos* is mentioned by numerous ancient writers, but only Theophrastus and especially Pliny the Elder provide descriptions. Theophrastus, for example, says it was used for seals and like *amethystos* was "transparent" (O.S. 5.30).⁸⁵ Pliny (*Nat.* 37.40.123), in speaking of pale *amethysti*, says the color "degenerates nearly into *crystalli*, since its purple fades away toward colourlessness."⁸⁶ Apart from the iron impurities that give it its color, amethyst is megascopically identical to rock crystal. It is indeed true that amethyst's color varies naturally from light to dark, but perhaps Pliny was also referring to the tendency of amethyst's color to fade on prolonged exposure to sunlight.

The fact that water, ice, and *krystallos* are colorless and transparent has led some ancient authors to think the latter was derived from the other two. For example, Diodorus Siculus (*L.H.* 2.52.2) says *krystallos* forms from "pure water . . . hardened, not by the action of cold, but by the influence of a divine fire."⁸⁷ Pliny the Elder (*Nat.* 37.9.23), in contrast, asserts that *crystallum* is "hardened by excessively intense freezing . . . and that it is a kind of ice is certain."⁸⁸ After listing the localities where *crystallum* can be found (*Nat.* 37.9.23–25), Pliny provides a geologically correct description of crystals of colorless quartz in saying "why it is formed with hexagonal faces cannot be readily explained; and any explanation is complicated by the fact that, on the one hand, its terminal points are not symmetrical and that, on the other, its faces are so perfectly smooth that no craftsmanship could achieve the same effect" (*Nat.* 37.9.26).⁸⁹ His mention of huge crystal sizes (*Nat.* 37.10.27) and common flaws (*Nat.* 37.10.28) also fit perfectly with rock crystal.

πιννινου or Pinninou,
Probably "Pearl" or Possibly "Mother-of-Pearl"

Theophrastus (O.S. 6.36) says pearls (φουσει or *physei*) come from "an oyster [that is, a type of *bivalve* mollusc] which is comparable to the *pinna*s, but smaller."⁹⁰ Pliny the Elder also mentions the *pina* mollusc (*Nat.* 9.65.142, 32.52.150) and says it is a source of pearls (his *margaritae*; *Nat.* 9.56.115). In Classical Greek, *pinnonas* is a "setter of pearls,"⁹¹ and so there is little doubt

85. Theophrastus, O.S. (Eichholz), 68–69.

86. Pliny the Elder, *Nat.* (Eichholz, LCL), 264–65.

87. Diodorus, *L.H.* (Oldfather, LCL), 54–55.

88. Pliny the Elder, *Nat.* (Eichholz, LCL), 180–81.

89. *Ibid.*, 182–83.

90. Theophrastus, O.S. (Eichholz), 70–71.

91. Liddell and Scott, *A Greek-English Lexicon*, 250 supplement.

the LXX's *pinninou* in Esth 1:6 refers to pearl, which was very popular for jewelry. It is conceivable, however, that the reference is to what today is called mother-of-pearl, which is the iridescent interior ("nacre") of some mollusc shells.

ὁ λίθος ὁ πρασινός or *ho lithos ho prasinos*,

Probably Some Variety of "Green Microcrystalline Quartz"

The expression *ho lithos ho prasinos* (that is, "the *prasinos* stone") appears only once in the LXX, in Gen 2:12. Theophrastus (O.S. 6.37) says that "*prasitis* . . . has the color of *iodes* (or verdigris)," where *iodes* generally means "rust" but here must refer to the bluish or greenish patina that forms on copper.⁹² However, given that the ancient Greek name of the green onion-like leek is *πρασον* or *prason*, it seems the color green is meant here. Pliny the Elder (*Nat.* 37.34.113) in speaking of "the many kinds of green stones . . . [says] a member of the commoner class is *prasius*."⁹³ Nothing more is known about *prasinos/prasitis/prasius*, but its color is enough to suggest it has the same meaning as *iaspis*, which earlier was interpreted as most likely a form of green microcrystalline quartz, either chalcedony or jasper.

σοομ or *Soom*, λίθος Σουφίρ or *Lithos Souphir*,

and θαρσεις or *Tharseis*, *All Unknown Gemstones*

Where these names appear in the LXX passages in table 2, they seem to refer to a kind of gemstone. These are not the Greek names of stones, however, but rather transliterated Hebrew words where the LXX translators did not know the Greek equivalents. For example, in 1 Chr 29:2, its only appearance in the LXX, *soom* corresponds to *š-h-m* or *šoham* in the same passage of the MT. *Šoham* is one of the breastplate gemstones, but its identity cannot be established for the reasons given previously.

The LXX has numerous clear references to the "gold of *Souphir*" (or 'Ophir in most English translations as derived from the Hebrew 'p-r), including Sir 7:18, Job 28:16, 1 Kgs 10:11 and 16:28, 1 Chr 29:4, and 2 Chr 9:10. 'Ophir is an unknown kingdom far to the south of Israel, on the shores of the Red Sea if not beyond, which was a source of not only gold but also fine wood and unspecified "precious stones" (1 Kgs 10:11 and 2 Chr 9:10). The LXX's *lithos Souphir* in Isa 13:12 and Tob 13:17 must refer to either "precious stones" or possibly gold. There is no reason to think *Souphir* in these passages is a transliteration of the Hebrew s-p-r or *sapir*, meaning the gemstone *sappheiros*.

In Dan 10:6, Ezek 1:16, and Song 5:14, the word *Tharseis* seems to have the meaning of a gemstone. This should not be confused with the biblical port city (location still unknown) of the same name mentioned in nearly two dozen OT passages. In the corresponding passages of the MT, the stone is identified as t-r-š-š or *taršiš*, one of the gemstones on Aaron's breastplate and in the possession of the king of Tyre. Again, as previously discussed,

92. Theophrastus, O.S. (Eichholz), 70–71.

93. Pliny the Elder, *Nat.* (Eichholz, LCL), 254–55.

there is no way of establishing the Greek equivalent of *taršiš*, and so the identity of this stone remains unknown.

DISCUSSION

The translations proposed here for the LXX gemstones fit well with the gemstones known to have been used during the first millennium B.C. The archaeological information in table 4 was an essential guide in choosing from among the multiple translation possibilities for some of the gemstones in accordance with the logic that the translations most likely to be correct are those that agree with the archaeological record. Other gemstones besides those in table 4 were undoubtedly employed during the first millennium B.C. but are too rare to appear in the archaeological record as it currently exists. It could be argued that the original designers of Aaron's breastplate would have selected some of the rarest, and hence most precious, gemstones available to them, including ones now missing from the archaeological record. Even if this happened, however, the Hellenistic LXX translators would only have known about the gemstones in common circulation in their time.

Some modern English-language Bibles provide lists of breastplate gemstones that are easily recognizable (the names more than the stones) to people today but cannot be based on any serious consideration of the LXX or archaeological record (for example, see the New American Standard Bible and the New International Version in table 1). The translators of these Bibles apparently reserved their scholarly rigor for the doctrinally significant passages, and for the breastplate they were content merely to convey a general impression of preciousness. A similar mindset may have existed among the LXX translators. Correctly translating the Hebrew gemstone names would have been less important than conveying the significance of what the stones represented.

Exod 28:21 and 36:21 (and also Sir 45:10–11) tell us that the breastplate gemstones were engraved with the names of the twelve tribes of Israel. For some scholars, this has been taken to mean that the breastplate could only have contained gemstones that were also commonly used for seals, with their intricately carved glyphic scenes and texts. If true, this would seem to rule out amber, lapis lazuli, and turquoise. Although lapis lazuli and turquoise were only rarely used for seals, and amber never, the more important point is that all three stones were valuable and attractive and so suitable for the breastplate. They certainly could have been engraved had there been a need to do so. In any case, the gemstones recognized by the LXX translators are not necessarily all the same ones actually used in the breastplate, although lapis lazuli, the most precious of all gemstones, surely would have been one of them, especially given that its Greek name (*sappheiros*) was easily understood from the Hebrew *sapir*.

In any consideration of the gemstones in Aaron's breastplate, some attention should be given to the arrangement of the stones. Was it essen-

tially random, was a specific color pattern intended, or was the placement of the stones dictated by their association with the twelve Hebrew tribes they represented? This is a topic for another study, but it can be noted here that, with the gemstone identifications in table 1, the first column of the breastplate consists of the four gemstones with warm colors (reds, yellows, and browns), and the other eight gemstones in columns two and three all have cool colors (six are either green, blue, or purple, and two are banded with white and dark colors). Whether this arrangement is by chance or is intentional is unknown.

CONCLUSIONS

The OT gemstones can be better understood in the LXX than in any other early witness to the Bible. Accordingly, I propose the following translations for the Greek gemstone names in the LXX. For the gemstones in Aaron's breastplate (Exod 28:17–20, 36:17–20; and also mentioned in many other passages, most notably Ezek 28:13): *σαρδιον* or *sardion*, definitely "carne-
lian" and "sard," plus possibly "red jasper"; *τοπαζος* or *topazos*, definitely "peridot"; *σμαραγδος* or *smaragdos*, probably "turquoise" but possibly "malachite"; *ανθραξ* or *anthrax*, definitely "red garnet"; *σαπφειρος* or *sappheiros*, definitely "lapis lazuli"; *ιασπις* or *iaspis*, probably some form of "green microcrystalline quartz" but possibly "amazonite"; *λιγυριον* or *lygyrion*, definitely "amber"; *αχατης* or *achatēs*, definitely "agate"; *αμεθυστος* or *amethystos*, definitely "amethyst"; *χρυσολιθος* or *chrysolithos*, probably "yellowish chalcedony"; *βηρυλλιον* or *bēryllion*, probably "aquamarine"; and *ονυχιον* or *onychion*, definitely "onyx" including probably "sardonyx." Translations for the other gemstones mentioned in the LXX: *κρυσταλλος* or *krystallos*, definitely colorless "quartz (rock) crystal"; *αδαμαντ* or *adamant*, probably not a gemstone but rather a "platinoid metal" in gold; *μετεωρα* or *meteora*, possibly "coral"; *πιννινου* or *pinninou*, probably "pearl" or possibly "mother of pearl"; *ὁ λιθος ὁ πρασινος* or *ho lithos ho prasinos*, probably some variety of "green microcrystalline quartz"; and *ελεφαντινον* or *elephantinon*, definitely "ivory." Four stones in the LXX were merely transliterated from Hebrew rather than translated into Greek, and so their meanings are unknown: *γαβις* or *gabis*; *σοομ* or *soom*, *λιθος Σουφιρ* or *lithos Souphir*, and *θαρσεεις* or *Tharseis*.

Table 4. Gemstones^a Used according to Archaeological Evidence

Rocks and Minerals ^b	1000–330 B.C. (Pre-Hellenistic Period)		330–30 B.C. (Hellenistic Period)	
	EM/WA ^c	Egypt	EM/WA ^c	Egypt
Amazonite		I	I	I
	translucent to opaque; light to medium green to bluish-green			
Beryl		-	r1	r1
<i>Aquamarine</i>	microcline feldspar (KAlSi ₃ O ₈)			
<i>Emerald</i>	transparent to translucent; Be ₃ Al ₂ (Si ₆ O ₁₈)	-	I	r1
Garnet	light to medium greenish-blue to blue	-	I	I
	light to dark green	I	I	I
	transparent to translucent; medium to mainly dark red, brownish-red or purplish-red, compositionally gradational pyrope and almandine; (Mg,Fe) ₃ Al ₂ Si ₃ O ₁₂			
Lapis Lazuli	opaque; dark blue lazurite (Na,Ca) ₈ (AlSi ₄) ₆ (SO ₄ S ₂ Cl) ₂ with golden pyrite (FeS ₂) and white calcite (CaCO ₃) as the main components	C	C	I
Malachite	opaque; banded light and dark green; Cu ₂ CO ₃ (OH) ₂	I	I	-
Obsidian	translucent; brownish-black to black volcanic glass; SiO ₂	I	I	I
Peridot	transparent to translucent; light to medium yellowish-green olivine; (Mg,Fe) ₂ SiO ₄	-	I	I
Quartz	SiO ₂			
<i>Macrocristalline</i> (transparent)				
Amethyst	light to dark violet		I	C
Citrine	light to medium yellow or brownish-yellow colorless	-	r1	r1
Rock Crystal		C	C	I
Smoky Quartz	light to dark brownish-black; occasionally translucent	-	I	-
<i>Microcristalline</i> (mainly fibrous/chalcedonic quartz; translucent)				
Agate	parallel, curved to wavy concentric layers with alternating lighter and darker colors, typically shades of gray, brown, or black	C	C	I
Carnelian	medium to dark orange, orange-red, brownish-red or red	C	C	C
+ Sard	medium to dark orange-brown, reddish-brown, or brown	C	C	C

"Common"	white or pale gray, yellowish white/gray to mainly bluish white/	c	r	c	r
Chalcedony	gray				
	green ^d	-	-	cl	r1
Onyx	parallel, planar layers with alternating white or light gray and dark gray or black	r	-	c	c
Sardonyx	parallel, planar layers with alternating white or light gray and reddish or brownish colors	c	r	c	c
	<i>Microcrystalline</i> (mainly granular/non-chalcedonic quartz; opaque) = Jasper				
	medium to dark green ^d	r	r	r	r
	medium to dark red	c	c	c	c
Sapphire	transparent to translucent; light to dark blue corundum; Al ₂ O ₃	-	-	r1	r1
Turquoise	opaque; light to medium green to greenish-blue or light blue; CuAl ₆ (PO ₄) ₄ (OH) ₈ ■ 5H ₂ O	r	c	r	c

Biogenic Materials

Amber	translucent; light to dark yellowish- to reddish-brown fossil tree resin	r	r	r	r
Coral	opaque; light to medium orange to mainly red or pink marine coral	-	-	r	c
Ivory	opaque; white or light yellowish-white elephant or hippopotamus tusk	r	r	r	r
Pearl	translucent to opaque; mainly white or silvery gray; includes mother-of-pearl	-	-	r	c

^aCommon misidentifications in the literature for gemstones used during the first millennium B.C.: (1) moonstone (orthoclase feldspar) for bluish-white chalcedony; (2) jade (also jadeite and nephrite) for green chalcedony; (3) rose quartz for pale amethyst; (4) topaz, "yellow sapphire," and zircon (or jacinth and hyacinth) for citrine; (5) green glass for peridot; and (6) ruby (corundum) and spinel for red garnet.

^bRelative abundance codes: c = common; r = rare; r1 = rare but first century B.C. only, especially the last half; cl = common but first century B.C. only, especially the last half; and - = either not reported or unconfirmed if reported.

^cEM/WA = Eastern Mediterranean/Western Asia region.

^dThe terms *bloodstone* (or *heliotrope*), *chrysoptase*, *plasma*, and *prase* refer to different subvarieties of greenish microcrystalline quartz (both fibrous and granular types) but are too inconsistently defined in the archaeological and geological literature to be used here.

