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The Testimony of Šabbetay Donnolo

# Glass and Glassmaking in Byzantine Italy: The Testimony of Šabbetai Donnolo

Giancarlo Lacerenza and David Whitehouse

SCHOLARS INTERESTED in the history of glass and glassmaking are well aware of the dearth of documentary evidence for the central Middle Ages.<sup>1</sup> The discovery of new sources is thus welcome, and works written in Oriental languages appear to be opening up a promising field of research.<sup>2</sup> The document discussed in this article sheds light on a particularly obscure period in the history of glass and demonstrates that useful information can be secured from even the most unexpected places.

## *Donnolo and His Texts (G.L.)*

Rabbi Šabbetai ben Avraham was born about 913 in Oria, Apulia, in southern Italy. He was known as Donnolo the Physician, and he is considered to have been the first Jewish medical author in western Europe.<sup>3</sup>

When Šabbetai was 12 years old, Oria was conquered by the Fatimid army, and he and his family were enslaved. After he was ransomed in Taranto by relatives, he spent the ensuing years wandering through Byzantine southern Italy and devoting himself to manual labor. Later, he began to study medicine, and he eventually became a well-known doctor and pharmacologist in Apulia and Calabria.<sup>4</sup> Donnolo is thought to have spent most of his life in the city of Rossano. He was very interested in astronomy and astrology, and he was also an avid collector of scientific texts in various languages. He was still alive in 982, but he probably died soon thereafter.

The *Sefer ḥakmōnī* (Wise Book) is Donnolo's main work. Written between 946 and 982, it contains an autobiographical introduction and commentaries on Genesis 1:26 ("Let us make

1. See the views recently expressed by Francesca Dell'Acqua, "La presenza/assenza dei vetrai nelle fonti scritte (secoli IV–XI)," in *La vetrata in Occidente dal IV all'XI secolo. Atti delle Giornate di Studi, Lucca 1999*, ed. Francesca Dell'Acqua and Romano Silva, *Il colore nel medioevo—Arte, simbolo, tecnica*, v. 3, Lucca: Istituto Storico Lucchese, 2001, pp. 195–211.

2. For one example, see Stefano Carboni, Giancarlo Lacerenza, and David Whitehouse, "Glassmaking in Medieval Tyre: The Written Evidence," *Journal of Glass Studies*, v. 45, 2003, pp. 139–149.

3. On Donnolo's life and works, see Andrew Sharf, *The Universe of Shabbatai Donnolo*, Warminster: Aris & Phillips, 1976; Gianfranco Fiaccadori, "Donnolo, Shabbetai bar Abrahām," in *Dizionario Biografico degli Italiani*, v. 41, Rome: Istituto per

l'Enciclopedia Italiana, 1992, pp. 213–218; and *Šabbetai Donnolo. Scienza e cultura ebraica nell'Italia del secolo X*, ed. Giancarlo Lacerenza, in press.

4. His activities in these two fields are described in the Greek biography of his contemporary Saint Nilus of Rossano. Cf. Cesare Colafemmina, "San Nilo di Rossano e gli ebrei," in *Atti del Congresso Internazionale su S. Nilo di Rossano (Grottaferrata 1986)*, Grottaferrata–Rossano: Università Popolare di Rossano–Amministrazione Comunale, 1989, pp. 119–130; Francesca Luzzati Laganà, "Catechesi e spiritualità nella vita di s. Nilo di Rossano: Donne, ebrei e 'santa follia,'" *Quaderni Storici*, v. 31, 1996, pp. 709–737; and *idem*, "La figura di Donnolo nello specchio della Vita di s. Nilo di Rossano," in *Šabbetai Donnolo* [note 3].

man in our image, according to our likeness”) and the famous and mysterious *Sefer y<sup>e</sup>šîrah* (Book of Creation).<sup>5</sup> It may also have included a section on astronomy, traces of which survive.<sup>6</sup>

In the *Sefer haḳmônî*, Donnolo talks about glass three times. The first reference is found in the commentary on Genesis 1:26, a wide-ranging comparison between man and the universe. In a discussion of how the four fluids of the human body (blood, red bile, black bile, and phlegm) can be likened to the four universal elements (air, fire, earth, and water), he writes:

ועל אשר לא יוכל האדם לתלות המים באויר בלא כלי כמו שעשה האלהים בכחו הגדול בתחלת בראשית נתן לו האלהים דעת ובינה והשכל ליתן מים בכלי זכוכית זכה וצחה ותופש הכלי עם המים בידו ומרים באויר העולם:

ועל שאין לאדם אור וננה וזהר כננה וזהר של הקבי"ה מרים את הכלי ההוא של זכוכית עם המים הזכים שבתוכו ומעמידו כנגד זהרו של שמש בחום הקיץ ויאחזו בידו האחרת הנעורת של פשתן זכה או צמר גפן או רקבון העצים אשר ביער איסקה שמה בלשון יון ורומיים ומעמיד את הנעורת או את הצמר או את הרקבון הנקרא איסקה כנגד כלי הזכוכית מרחוק ומפני זהר השמש אשר יזהיר בכלי הזכוכית יוצא ועובר זהר חום השמש מתוך כלי הזכוכית ומתוך המים אשר בו אז יבער צמר הנפן או הרקבון או הנעורת וידליקו כמו אש: זה לדעת להוציא רוח מרוח ומים מרוח ואש ממים:<sup>7</sup>

5. For the Hebrew text of *Sefer haḳmônî*, which has not been translated into English, see David Castelli, *Il commento di Sabbatai Donnolo sul Libro della Creazione, pubblicato per la prima volta nel testo ebraico con note critiche e introduzione da David Castelli*, Florence: Le Monnier, 1880. For the text of *Sefer y<sup>e</sup>šîrah*, see Ithamar Gruenwald, “A Preliminary Critical Edition of *Sefer Yezira*,” *Israel Oriental Studies*, v. 1, 1971, pp. 132–177.

6. Sharf [note 3], pp. 186–187.

7. Hebrew text in Castelli [note 5], p. 28; and Sharf [note 3], p. 174. A slightly different version has been found in a Genizah fragment published by Alexander Scheiber, “A New Pas-

Translation:

And since man cannot suspend water in the air without [any] instrument<sup>8</sup>—as God did with his great power at the beginning of Creation—God gave him insight, understanding, and intelligence, to put water, transparent and clear, in a glass vessel, so that he [could] hold the vessel with the water in his hand, raising [it] in the air of the world.

And since man has neither light nor radiance and brightness—which is [an attribute solely] of the Holy One, blessed be he—he raises that glass vessel containing the transparent water and makes it stand toward the sunshine in the summer heat; then he takes in his other hand a tow of pure flax or cotton or touchwood of the forest, called *esca* in the language of the Greeks and of the Romans, and he makes the tow of flax—or the cotton or the touchwood called *esca*—stand toward the glass vessel from afar and in front of the sunshine<sup>9</sup> that illuminates the glass vessel [so that] the hot sunshine goes forth and passes through the glass vessel and the water within it. Then the cotton [or the touchwood or the tow] will burn and be kindled like fire.

This is to understand<sup>10</sup> how spirit [can] go forth by spirit, water by spirit, and fire by water.

In weaving his micro- (human) and macro-cosmic (universal) similitudes, Donnolo draws his examples, not from a philosophical or theoretical base, but from the practical experiences of everyday life.<sup>11</sup> These descriptions include

sage from the Commentary on ‘Let Us Make Man in Our Image’ by R. Shabbetai Donnolo,” *Sinai*, v. 30, 1952, pp. 62–64 (in Hebrew).

8. כלי, *k<sup>e</sup>li*, can mean “vase, vessel” or, more generically, “implement, instrument.” Here, both meanings are employed.

9. Variant reading in Scheiber [note 7], p. 64: זוהר חום השמש, “hot sunshine.”

10. Variant reading in *ibid.*: זה לך לדעת, “This is for your understanding.”

11. His other examples include observations on the making of solid deposits in copper boilers (i.e., earth from water by means of fire) and in wine casks (earth by water).

terms from his Italian-Byzantine environment,<sup>12</sup> as well as a likely application of his own experience in his citation of Ecclesiastes 2:11: “I looked on all the works my hands had wrought and on the labors that I had labored to do, for there was no manual work seen by my eyes that my hands did not turn to.”<sup>13</sup>

The other two references to glass in the *Sefer ḥakmônî* appear in the commentary on the *Sefer y<sup>ṣ</sup>īrah*. In his explanation of the verse “Ten *s<sup>ṣ</sup>firôt b<sup>ṣ</sup>lī-mah,*” Donnolo says that while man needs various materials if he wants to create something, God requires nothing, since he can create *ex nihilo*. Again, he takes his examples from everyday life:

פירוש בלימה בלי מאומה ללמדך שכל אומן הרוצה לעשות בנין אם אין לו אבנים ועפר ועצים ומים וכלי הבנין אינו יכול לעשות בנין ואם רוצה לעשות כלי עץ או כלי זכוכית או כלי ברזל או כלי נחשת או כלי כסף או כלי זהב או מכל דבר אם אין לו עץ או זכוכית או ברזל או נחשת או כסף או זהב או אותו דבר שרוצה לעשות ממנו הכלי אינו יכול לעשות הכלי והאל הגדול והנבור והנורא ברא את העולם בלי מאומה מכחו הגדול:<sup>14</sup>

Translation:

Explanation of *b<sup>ṣ</sup>lī-mah*: “without anything.” [This is] to teach you that every craftsman who wants to build a palace, if he does not have stones, earth, wood, water, and building implements, he cannot build the palace. And if he wants to make an instrument (*k<sup>ṣ</sup>lī*) of wood, glass, iron, copper, silver, gold, or any [other] material, if he does not have wood, glass, iron, copper, silver, gold, or some other material that he can use to make the instrument, he will not be able to make it. But God—great, almighty, and feared—created the world without anything, with his great power.

Later in this section of his text, Donnolo offers a passage that is the most interesting of the three discussed here, since it provides a detailed description of the process of glassmaking. He

reminds his readers that God accomplished the whole of Creation just by blowing his spirit. Therefore, his formation of the world is comparable to the act of glassblowing:

שתים רוח מרוח כיצד הוציא האלהים רוח מרוחו הקדוש וחקק נחצב באותו הרוח שנפח והוציא מרוחו את חללו של עולם וארבע פינות העולם מזרח ומערב צפון ודרום ורוח בכל אחד מהם מרשות האל יתעלה: [. . .]  
האומן של זכוכית כשיחפוץ לעשות כלי זכוכית לוקח כלי ברזל שהוא נבוב מקצה אל קצה ולוקח מן הזכוכית הנותך שבכור הכשבן ונותן בפיו את קצה הכלי ההוא הנבוב ונופח רוח בפיו ועובר הרוח מתוך הכלי ההוא עם הזכוכית הנתכת והנמסת הדבוקה בקצה הכלי ההוא הנבוב ומכח נפיחת הרוח נמתכת הזכוכית ונעשית כלי בין גדול בין קטן בין גלול בין בעל ארבע פינות בין ארוך בין רחב בין קצר כמו אשר יחפוץ האדם האומן לעשות כפי כחו המזער והאל הגדול הנבור והנורא בכחו הגדול הוציא רוח מרוחו ונמתח חלל של עולם עד שאמר לו די:<sup>15</sup>

Translation:

Two: spirit from spirit. How? God makes spirit go forth from his Holy Spirit, then he cuts and engraves with the spirit he blew; and from his spirit he makes the void of the world and the four corners of the earth—east, west, north, and south—go forth, and a spirit from every one of them rises with the permission of the Lord. [. . .]

12. This makes the use of calques unlikely, although here and there some literary antecedents can be detected. For instance, Sharf ([note 3], pp. 65–66, relying on Abraham Epstein, “Recherches sur le Séfer Yeçira,” *Revue des Etudes Juives*, v. 29, 1894, pp. 66–67) wonders if Donnolo had some knowledge of sources such as John Lydus (sixth century), in whose *De mensibus* 2.8 there is a passage on the elements similar to that in the *Sefer y<sup>ṣ</sup>īrah* noted above. However, the (Greek) text of Lydus is fairly far removed from Donnolo’s exposition; see *Ioannis Laurenti Lydi liber de mensibus*, ed. Ricardus Wuensch, Lipsiae: Teubner, 1898, pp. 25–28, where not a single word on glass-making is included.

13. From the Hebrew text in Castelli [note 5], p. 4.

14. *Ibid.*, p. 38.

15. *Ibid.*, p. 39.

The glassmaker<sup>16</sup> who desires to make a glass vessel takes an instrument of iron that is bored from side to side; then he takes [a portion] of the melted glass that is in the oven of the furnace, puts in his mouth the bored side of that instrument, and blows a breath<sup>17</sup> with his mouth. Then the breath passes through that instrument up to the melted and flowing glass that is stuck on the [other] side of that bored instrument, and with the force of the breath, the glass is made [into] a vessel, big or small, round or four-edged, long, large or short. [As] the craftsman desires to make [something] with his limited power, [so] God—great, almighty, and feared—with his great power makes the spirit go forth from his Spirit, stretching the void of the world until it said to him, “It is enough.”

*Donnolo's Texts: An Archeological Perspective (D. W.)*

Šabbetai Donnolo's references to glassmaking are noteworthy because he wrote them in southern Italy in the late 10th century, a place and period about which students of the history of glass are extraordinarily ignorant. Donnolo was born at Oria in Apulia, and he spent most of his life at Rossano in Calabria. In the last passage quoted above, he described glassblowing in terms that suggest he witnessed a glassblower at work. (As Giancarlo Lacerenza emphasizes, we do not know of any source from which Donnolo might have copied his description, and so we must assume that he watched a glassblower somewhere in southern Italy.)

The richest source of information about the glass made and used in southern Italy in the early Middle Ages is the excavation at the site of the Benedictine abbey of San Vincenzo al Volturno in the province of Isernia. The abbey was located in the Lombard duchy of Benevento, and it enjoyed the patronage of successive dukes. It was destroyed in 881. The finds from San Vincenzo clearly demonstrate the range of glass that was available to the elite of southern Italy in the ninth century.<sup>18</sup> Finds from the palatine chapel of Duke Arechis II (r. 758–787) at Salerno show

that the glass available at San Vincenzo was not unique.<sup>19</sup>

Our knowledge of glass in southern Italy after the ninth century is strictly limited. At San Vincenzo, deposits assigned to Period 6a and dated between the early 10th and mid-11th centuries contained fragments of glass vessels, but in most cases it is impossible to determine whether they were new or residual when they went into the ground. The fragments include bucket-shaped lamps with vertical handles on the rim; hanging lamps with a hollow stem; goblets with a more or less hemispherical bowl, a narrow stem, and a conical or disk-shaped foot; and bottles.<sup>20</sup>

The richest published source of information about glass in the 10th and 11th centuries is the excavation at Otranto in the province of Lecce, one of the Italian ports closest to Greece and for centuries a major Byzantine base. Phase IV in the sequence of deposits at Otranto appeared to follow a period in which the excavated part of the city was at least partly (perhaps almost completely) abandoned. Phase IV began after the seventh century, and coins suggest that it probably began in the ninth century and ended in the late 11th century.<sup>21</sup>

16. Here, in Hebrew, *ha-umman šel zekûkîl* (האומן של זכוכית), lit. “the manufacturer of glass.”

17. רוּחַ, *rûah*, which Donnolo uses both for (divine) “spirit” and (human or divine) “blow.”

18. Francesca Dell'Acqua with Deborah Jones, “The Window Glass,” in *San Vincenzo al Volturno*, v. 3, *The Finds from the 1980–1986 Excavations*, ed. John Mitchell and Inge Lyse Hansen, Studi e ricerche di archeologia e storia dell'arte, no. 3, Spoleto: Centro Italiano di Studi sull'Alto Medioevo, 2001, pp. 173–201; Judith Stevenson, “The Vessel Glass,” in *ibid.*, pp. 203–277.

19. Francesca Dell'Acqua, “Nota sui reperti vitrei del monastero di San Vincenzo al Volturno e della cappella palatina di Arechi II a Salerno,” *Rassegna Storica Salernitana*, v. 14, pt. 1, 1997, pp. 243–257.

20. Stevenson [note 18], pp. 215–216, nos. 55–60, 63, 65, and 66; pp. 219–220, nos. 92–95; p. 224, nos. 136–139; pp. 225–229, nos. 151, 155, and 157; pp. 231–235, nos. 239 and 244; and p. 254, nos. 466–468.

21. David Wilkinson, “Summary and Discussions: Phases I–VIII,” in *Excavations at Otranto*, v. 1, *The Excavation*, ed. Demitrios Michaelides and David Wilkinson, Collana del Dipartimento, v. 5, Lecce: Dipartimento di Scienze dell'Antichità, Università degli Studi, Lecce, 1992, pp. 41–58.

The glass from Phase IV included goblets with a more or less hemispherical bowl, a narrow stem, and a conical or disk-shaped foot; bottles; and two exceptional objects<sup>22</sup>: a vessel blown in an optic mold and a fragment with a narrow neck constricted several times, which may be an import from the Islamic world.<sup>23</sup>

An equally exotic glass vessel was recovered from a 10th- to 11th-century deposit in the Grotta di San Michele at Olevano sul Tusciano in the province of Salerno. The object is a cup with an egg-shaped body, made of transparent green glass and decorated with opaque white trails and prunts.<sup>24</sup> A similar cup was found at Saint-Savin-sur-Gartempe in southern France, in a context that suggested it may date from the mid-11th century.<sup>25</sup>

It is interesting to compare our scant knowledge of 10th- to 11th-century glass in southern Italy with what we know about glass in Sicily in the same period. Excavations at Palermo and elsewhere have revealed a restricted range of late 10th- to 11th-century vessels: tumblers with a flaring side and a flat or concave base, and goblets with a short stem and a flat or conical foot.<sup>26</sup>

In short, the archeological evidence for glass in southern Italy at the time when Šabbetaï Donnolo described glassblowing suggests that

the most common glass vessels were lamps, goblets, and bottles. Although most of these objects were probably made locally, a few imported vessels (such as the bottle from San Vincenzo al Volturno and the cup from Olevano sul Tusciano) were also available.

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22. Maria Teresa Giannotta, "Vetri romani e medioevali," in *Excavations at Otranto*, v. 2, *The Finds*, ed. Francesco D'Andria and David Whitehouse, Collana del Dipartimento, v. 6, Lecce: Dipartimento di Scienze dell'Antichità, Università degli Studi, Lecce, 1992, pp. 219–240, esp. p. 229, nos. 65–67.

23. *Ibid.*, p. 229, no. 66. Cf. George T. Scanlon and Ralph Pinder-Wilson, *Fustat: Glass of the Early Islamic Period. Finds Excavated by the American Research Center in Egypt, 1964–1980*, London: Altajir World of Islam Trust, 2001, pp. 47–49, types 20a–20i.

24. Alessandro di Muro and others, "Luce dalla grotta: Primi risultati delle indagini archeologiche presso il santuario di San Michele ad Olevano sul Tusciano," *III° Congresso Nazionale di Archeologia Medievale (Castello di Salerno, 2–5 ottobre 2003)*, Florence: All'Insegna del Giglio, 2003, pp. 393–410.

25. Dominique Simon-Hiernard, "Le Vase de Saint-Savin: Un exceptionnel verre médiéval au musée Sainte-Croix de Poitiers," *Revue du Louvre et des Musées de France*, v. 1, 2001, pp. 68–75.

26. Philippe Tisseyre, "Consumo e produzione del vetro in Sicilia occidentale (XI–XV sec.)," *III° Congresso Nazionale* [note 24], pp. 422–427; *idem*, "Le Verre médiéval en Sicile Occidentale (fin X<sup>e</sup>–début XIV<sup>e</sup>)," *Il vetro in Italia meridionale e insulare, Atti del Primo Convegno Multidisciplinare, Napoli, 5–6–7 marzo 1998*, Naples: De Frede Editore, 1999, pp. 127–137.