

The Geography of Jewish Ethnogenesis

ARAM YARDUMIAN, *Department of History and Social Sciences, Bryn Athyn College, Bryn Athyn, PA 19009-0717, and Department of Anthropology, University of Pennsylvania, Philadelphia, PA 19104-6398, USA. Email: aram2@sas.upenn.edu*

THEODORE G. SCHURR, *Department of Anthropology, University of Pennsylvania, Philadelphia, PA 19104-6398, USA*

A reevaluation of the anthropological genetics literature on Jewish populations reveals them not simply to be a body of genetically related people descending from a small group of common ancestors, but rather a “mosaic” of peoples of diverse origins. Greek and other pre-medieval historiographic sources suggest the patterning evident in recent genetic studies could be explained by a major contribution from Greco-Roman and Anatolian-Byzantine converts who affiliated themselves with some iteration of Judaism beginning in the first and second centuries CE and continuing into the Middle Ages. These populations, along with Babylonian and Alexandrian Jewish communities, indigenous North Africans, and Slavic-speaking converts to Judaism, support a mosaic geography of Jewish ancestry in Europe and Western Asia, rather than one arising from a limited set of lineages originating solely in Palestine.

Key words: Ashkenazi, Mediterranean, diaspora, genetics, mtDNA, Y-chromosome, autosomes, haplotype

The idea that contemporary Jews descend from the Israelite¹ tribes of antiquity who fled or were deported as slaves by the Romans from Judaea following the destruction of the Second Temple (70 CE), as well as by the Assyrian and Babylonian militaries in the eighth and sixth centuries BCE, is a basic assumption built into nearly all published works on the subject (e.g., Gilbert 2006; Goldenberg 2007; Graetz 1893, 1894; Konner 2003; Ostrer 2012). Attempts to investigate this notion scientifically began in the eighteenth century and continue today, although most have been aimed at confirming the biological boundedness of Jews rather than looking for their origins in Eurasian social history.² Hampered by a lack of textual sources covering some crucial periods, very little progress has been made in these efforts, and until recently there has been no way to either finally confirm or significantly challenge this traditional assumption about Jewish ethnogenesis.³ While this three-hundred-year historiography of inquiry into the origin of the Jews is reviewed at length elsewhere (Weitzman 2017), now, in the era of genomic studies, it is possible to look more closely at the geography of Jewish origins and the singularity or multiplicity of their roots.

Submitted November 28, 2017; accepted May 31, 2018; published online May 8, 2019.
Journal of Anthropological Research (Summer 2019). © 2019 by The University of New Mexico.
All rights reserved. 0091-7710/2019/7502-00XX\$10.00

GENETIC EVIDENCE FOR PAN-MEDITERRANEAN ORIGINS OF JEWISH POPULATIONS

Population genetics research into this question has done much to clarify the relatedness of Jewish individuals and groups, but also fostered its own series of conflicts where geography and chronology are concerned. Of the numerous and varied studies published since the 1950s, some number of researchers have interpreted the genetic data as showing that Jewish people constitute a mostly homogeneous community that emerged from Hebrew-speaking tribes of the Levant, with or without limited European and North African admixture (Behar et al. 2003, 2004a, 2004b, 2006, 2010; Hammer et al. 2000, 2009; Livshits et al. 1991; Ostrer and Skorecki 2013; Rootsi et al. 2013; Shen et al. 2004; Skorecki et al. 1997). Other researchers are more circumspect in their conclusions concerning a specific geographic origin or simply have not been directly concerned with the issue, focusing instead on genetic admixture between Jewish and non-Jewish Middle Eastern men (Hammer et al. 2000), within Ashkenazi Jews (e.g., Behar et al. 2004a; Carmi 2014; Listman et al. 2010; Need et al. 2009), and between Jewish populations (Behar et al. 2010; Bray et al. 2010; Campbell et al. 2012; Zoossman-Diskin 2010). Certain genome-wide studies have yielded a view of Jewish populations as being tightly clustered and reasonably distinct from neighboring populations (Behar et al. 2010; Campbell et al. 2012), while very recent research into admixture history (Xue et al. 2017) has further revealed the complexity of Jewish (in this case, Ashkenazi) population history. Various other studies offer further valuable insights into the genetic composition of contemporary Jewish communities (Atzmon et al. 2010; Behar et al. 2003, 2004b, 2006, 2013; Feder et al. 2007; Haber et al. 2013; Hammer et al. 2000, 2009; Karlin et al. 1979; Kopelman et al. 2009; Livshits et al. 1991; Muhsam 1964; Nebel et al. 2001, 2005; Olshen et al. 2008; Ostrer and Skorecki 2013; Seldin et al. 2006; Shen et al. 2004; Thomas et al. 1998).

Yet, none of these studies have successfully offered a specific geographic locus for Jewish origins. A concerted review of the entire body of Jewish population genetics literature, in tandem with associable textual sources, reveals not a body of genetically related people with common primary ancestry in the Levant followed by European admixture but rather a mosaic of people of multiple and geographically diverse origins, such as can only be explained by significant conversion over time. We therefore propose a process of Jewish ethnogenesis shaped by the social and socioeconomic currents of early and Medieval Eurasia and contributions from a mosaic of circum-Mediterranean and Black Sea communities, not one arising simply from an exiled Levantine population.

In support of this view, we review evidence in support of a heterogeneous, or mosaic, origin for contemporary Jewish populations through four landmark papers (Atzmon et al. 2010; Behar et al. 2013; Costa et al. 2013; Xue et al. 2017), supplemented by significant observations from others. Together, these studies build an argument for the origins of contemporary Ashkenazi Jewry in pan-Mediterranean (as

well as other European and Babylonian) converts to Judaism, and possible later contribution by Levantine Hebrew-speaking individuals.

The first of these studies (Atzmon et al. 2010) analyzed autosomal, mitochondrial DNA (mtDNA), and Y-chromosome (NRY) variation in Jewish and comparative populations. Its authors concluded that Ashkenazi Jews were more closely related to regional “host” European populations than to Levantine or other Middle Eastern populations, whereas Iranian and Iraqi Jews clustered more closely with their host populations in the Arab and Persian worlds. Perhaps most significantly, they noted little Southern European ancestry in Mizrahi Jews but a more significant contribution to the Ashkenazim, while also tacitly assuming that Jews who migrated or were exiled from Judaea or Roman Palestine formed another component part of this population history. Although no clear geographic line was drawn between these Jewish populations, the observed clustering with host populations fell along the lines of the Roman-Persian imperial division of this region.

Atzmon et al. (2010) further noted in their identity-by-descent (IBD) analysis of autosomal DNA markers a limited sharing of identical genomic segments among Jews. This finding indicated that any large sequence blocks resulting from a recent common origin had been broken up by recombination, suggesting that the ancestors of all Jews were numerous and existed in the distant past. In this regard, the greater sharing of short sequence blocks among Ashkenazi Jews would indicate, by contrast, the occurrence of an ancient founder effect or a less-diverse source population. In their opinion, the genetic proximity of Ashkenazi Jews to French and Mediterranean populations “favors the idea of ‘non-Semitic’⁴ Mediterranean ancestry in the formation of the European/Syrian Jewish groups” (Atzmon et al. 2010:857).

In the second of these papers, Behar et al. (2013) also undertook an IBD analysis of genomic data from Jews and other Western Eurasian regional populations. After subjecting these data to spatial ancestry and admixture analyses,⁵ they observed that “Ashkenazi Jews show significant IBD sharing only with Eastern Europeans, North African Jews and Sephardi Jews” (as well as Cypriots and Sicilians), and only minimally with Middle Eastern populations, with Ashkenazi Jews having a strong genetic affinity with Sephardic Jews (Behar et al. 2013:29). Similarly, in the principal component analysis (PCA), Ashkenazi Jewish individuals formed a relatively tight cluster with Jews from Italy, the Middle East, North Africa, and Spain. However, this cluster was also positioned near several non-Jewish populations (i.e., Armenians, Cypriots, Druze, Greeks, and Sicilians) that were characterized as “Middle Eastern” (Behar et al. 2013).⁶

Although these findings suggest a common ancestry for Ashkenazi, North African, and Sephardi Jews, the analysis also revealed support for an Italian source in the autosomal single-nucleotide polymorphism (SNP) analysis, thus suggesting a southern European origin. Furthermore, the assertion that “most lineages in the Ashkenazi Jewish population along the male and female lines trace primarily to the Levant” (Behar et al. 2013:8) is difficult to sustain when the Ashkenazi population clusters

in equidistance from European (Cypriot, Greek, and Sicilian, Tuscan, and Abruzzian Italian) populations and only a single Levantine population (Druze), whose geographic origin is extremely complicated (Shlush et al. 2008).⁷ In fact, rather than demonstrating a strictly Levantine origin for contemporary Ashkenazi and Sephardi Jews, the Behar et al. (2013) study suggested a more diffuse, circum-Mediterranean origin for them.

In order to understand the import of the third paper (Costa et al. 2013), it is necessary to review two previous papers (Behar et al. 2006; Feder et al. 2007) whose data and conclusions were reevaluated in it. In the first, Behar et al. (2006) claimed 40% of the current Ashkenazi population descended from four women bearing mtDNA lineages, or haplogroups, called K1a1b1a, K1a9, K2a2a, and N1b, and estimated their coalescence times to between the first and second centuries CE.⁸ Similarly, Feder et al. (2007) evaluated the distribution of mtDNA lineages in European populations. Although not assigning a specific geographic origin(s) to these four putative founding maternal lineages, they interpreted the mtDNA data as showing that the haplogroup distributions in the sampled Ashkenazi populations (Russian, Ukrainian, Polish) were significantly different from those of local populations. They further suggested that this difference could be attributable to genetic drift or multiple founder events with subsequent interpopulation gene flow.

These findings were later reassessed by Costa et al. (2013), who analyzed ~2,500 complete and 28,000 partial mtDNA genomes of mostly non-Jews and 836 partial mtDNA genomes of Ashkenazi Jews. They concluded that 65–81% of Ashkenazi mtDNAs belonged to autochthonous European lineages, and that only 8% of them were demonstrably “Near Eastern” in origin, with the remaining 11–27% being ambiguous in origin (Costa et al. 2013). Although the authors suggested that K1a9 and N1b2 might derive from “Near Eastern” sources, thereby reducing the proportion of European maternal ancestry to ~65%, this interpretation was by no means certain. Furthermore, the single most frequent of these mtDNA lineages, K1a1b1a, has recently been discovered in a Neolithic individual from Spain (Haak et al. 2015), thus demonstrating its presence in prehistoric Mediterranean Europe. The deep Southern European ancestry for the primary Ashkenazi maternal lineages points to a “significant role for the conversion of women in the formation of Ashkenazi communities” (Costa et al. 2013:1) and, thus, to large-scale conversions rather than exclusively Levantine ancestry for European Jews.⁹

The most compelling evidence to date of a mosaic ancestry for contemporary Jews comes from the work of Xue et al. (2017). Their admixture analysis suggested a 70% European origin (and within this, 55% Southern Europe, 10% Eastern Europe, 5% Western Europe) and a 30% “Levantine” component in Jewish populations. In making these estimates, Xue et al. (2017) assumed the Levant to be the most likely source for the “Middle Eastern” apportionment of Ashkenazi Jewish ancestry and, thus, did not make any effort to distinguish Levantine from Anatolian or Babylonian ancestral

components.¹⁰ As will be demonstrated below, contributions from both Anatolian and Babylonian converts to the genetic diversity of contemporary Jewry is highly likely. Nevertheless, Xue et al. (2017) drew an important conclusion about the timing of admixture as reflected in Ashkenazi Jewish genomes, observing a strong Southern European presence (34–61%) at the root of the population tree, prior to a population bottleneck ~25–35 generations ago. While the analysis was unable to identify the ultimate source population, the founding event for Ashkenazi Jewry almost certainly occurred in Southern Europe (Xue et al. 2017).

The abovementioned papers focus mostly on Ashkenazi Jews, mainly because Sephardic and North African Jews have received substantially less scholarly attention. Although more work with the Sephardi population, as well as an analysis of its complex relationship with Ashkenazi Jews, is badly needed, a few recent studies (e.g., Campbell et al. 2012) have made important inroads into demonstrating a diverse, convert-mediated origin (including local Berber converts) for contemporary Jewry. A further problem with existing scholarship is that the term “Sephardi” seems to mean very different things to different researchers. For example, Nebel et al. (2001) concluded that Sephardi Jews (including, for their purposes, the Iberian Peninsula, North Africa, Turkey, Syria, and Iraq) have more in common genetically with Western Asian peoples such as Turks, Kurds, and Armenians than with local Arabs and Berbers. Regardless of liturgical affiliation, the aggregation of groups from Iberia to the Fertile Crescent into a single population is certain to produce unpredictable results and thus should be viewed with caution.

From a paternal genetic standpoint, similar problems of interpretation arise when presuming a Levantine origin for contemporary Jews. The idea that Cohanim Y-chromosome lineages are proof of a Levantine origin for Jewish males has been suggested numerous times (Behar et al. 2003; Hammer et al. 2009; Rootsi et al. 2013; Skorecki et al. 1997). For example, Hammer et al. (2000) concluded that the majority of Ashkenazi and Sephardi Jews shared paternal lineages common among Middle Eastern populations but not in European groups, thus suggesting a “Middle Eastern” origin for the Ashkenazim, although this conclusion was qualified by weak statistical support.¹¹ In addition, the absence of populations from key corridors and centers of Jewish settlement, such as Belarus, Lithuania, and Poland, could have influenced the results of the study, which favored a Levantine origin for Eastern European Jews.

Y-chromosome studies by Nebel et al. (2000, 2001, 2005) also supported the suggestion that Ashkenazi males were more closely related to “Middle Eastern” populations than to “host” European populations (Rhine French, German, and various Eastern European groups). In this regard, the range of NRY haplogroups present in Jewish populations was broad. Of the twelve most frequently identified paternal lineages or haplogroups (E1b1b1a-M78, E1b1b1c-M123, E3b, G2b-M377, J-P58, J1-M267, J2a-M410, J2a1b-M67, Q1b-M378, R1a1a-M17, R1b1b2-M269, R1b1-P25), all but one may be found throughout the Mediterranean, Asia Minor, Iran, and the Cau-

casus (Behar et al. 2004a, 2004b; Hammer et al. 2009; Semino et al. 2004; Sengupta et al. 2006; Underhill et al. 2015). Thus, this distribution broadens the potential geographic region of origin to include most of Western Asia.

According to Nebel et al. (2001), the presence of haplogroups R1a1a-M17 and G2b-M377, both of which at the time were minimally reported in Near Eastern populations, could be viewed as representing European gene flow or even “Khazar admixture.” While R1a is the predominant NRY haplogroup in Eastern European populations (Underhill et al. 2015), subsequent research has suggested that this paternal lineage has Near Eastern rather than European roots (Haber et al. 2013; Myres et al. 2011; Rootsi et al. 2013). However, an origin in Asia Minor (Cinnioglu et al. 2004) or Iran (Nasidze et al. 2004; Underhill et al. 2015) cannot be ruled out. In fact, Behar et al. (2017) points to a northern Iranian rather than a Levantine source for the Ashkenazi R1a lineage, thus making the long-running story of the Cohen modal haplotype even stranger.

A third NRY haplogroup, R1b, appears in Ashkenazim at modest frequency (10%) but occurs with moderate frequency in the Middle East and greater frequency in Western Europe (Herrera et al. 2012; Myres et al. 2011; Nebel et al. 2001; Tofanelli et al. 2015). Behar et al. (2004a) proposed that both R1a and R1b could have been present at low frequencies in the Ashkenazi founding population(s), wherever these lineages originated. They also noted reduced Y-chromosome short tandem repeat (Y-STR) polymorphisms among Ashkenazi males and interpreted this pattern to have resulted from a founder effect, followed by high levels of endogamy and some amount of European admixture.

As for the other eleven NRY haplogroups identified in Jewish populations, Ostrer and Skorecki (2013:123) claim that five of them (E-M215 [E3b], G, J1, J2, and Q) “were part of the ancestral gene pool transmitted by Jews who migrated from the Middle East [i.e., Judaea].” However, these data could just as readily be interpreted as evidence for the source of these lineages in Asia Minor (Cinnioglu et al. 2004:127, see the list in paragraph one), where they are also quite frequent.

Although the autosomal genetic data presented by Zoosmann-Diskin (2010) derive from only 17 SNP loci, his argument for an Italian-peninsula-based origin for Ashkenazi Jews still bears consideration. Based on autosomal, mtDNA, and NRY data, this study positions Eastern European Jews closer to their non-Jewish neighbors, especially Italians, than to other Jewish populations. It included data from six Jewish populations (Eastern European, Moroccan, Iraqi, Iranian, Yemenite, and Ethiopian—but, unfortunately, not Sephardim) spanning the broad historical geographic range of Jewish liturgical tradition, and those from five other Jewish populations (Bulgaria, Turkey, Djerban, Libya, Tunisia). These results indicated no particular similarity between the Jewish populations and furthermore that Eastern European Jews were “closer to Italians in particular, and to Europeans in general than to the other Jewish populations” (Zoosmann-Diskin 2010:2–3). Thus, Eastern European Jewry was

interpreted genetically as an autochthonous European population (Zoosmann-Diskin 2010:2–3). This research, more clearly than any other to date, demonstrates that contemporary Jewish populations (at least those investigated) do not share a common origin.

By contrast, Shen et al. (2004) asserted not only that Jewish (and Samaritan) patrilineages shared a common ancestry, but that their common ancestor also appeared in a Cohanim individual living at the time of the Assyrian conquest of the kingdom of Israel (Shen et al. 2004). While it is, of course, impossible to say that the common paternal ancestor was a member of the Cohanim, the chief weakness of this study is its tiny sample size.¹² Thus, while this study provides interesting insights into Samaritan haplotype diversity and male-mediated endogamy, it is limited in its ability to identify common genetic ancestry of Jewish populations.

Despite the perennial problem of establishing phylogeographic patterning in a region where, due to long-term land and maritime migration, many genetic lineages are associated with multiple locations (Di Giacomo et al. 2004; Pinhasi et al. 2012; Posth et al. 2016; Yardumian and Schurr 2011), it is no longer possible to consider contemporary Jewry as representing a single population—one with a limited set of founding lineages arising from a single geographic locus. While it is likely that some Jewish individuals do descend from the Hebrew-speaking tribes of antiquity, the case for this at a larger scale is, at present, weak. Identifying the geographic sources of specific lineages will be challenging since there are no modern proxies for the populations of the Iron Age Levant, cosmopolitan as it surely was.¹³ Furthermore, regardless of which study is viewed the more robust analysis of the genetic affinities between Jewish liturgical zones (Ashkenazi and Sephardi; comparative studies of Mizrahi are lacking), it would still seem there is more diversity within these communities than between them.

SOCIAL PROCESSES ARE KEY TO THE FORMATION OF EARLY WESTERN ASIAN JEWISH COMMUNITIES

The major circulating ideas about Jewish ethnogenesis were developed in a time prior to advanced human genetic and genomic studies. These ideas have tended toward the homeland-diaspora model, drawing on biblical and post-biblical sources for an exile/founder effect model, or the Khazar model (which has been tested twice without success; see Elhaik 2012 and Das et al. 2016). The two models, in all their forms, visualize Jewish ethnogenesis as an expansive process, beginning with a single source population that then spreads and develops into multiple different geographic communities. Since the genetic evidence is instead strongly suggestive of a heterogeneous and generalized Western Asian and European origin for contemporary Jewry, we propose to invert this model, visualizing Jewish ethnogenesis as a socially reductive process, beginning with multiple communities of converts who gradually became more unified as tolerance toward their presence in Europe declined. The genetic evidence points to origins for these Jewish communities in the pan-Mediterranean and Black Sea regions,

Babylon, and the Slavic world. The social processes that led individuals in these regions to convert to Judaism are no doubt variegated, for which reason it becomes all of the more important to interpret these data in light of historiographic sources.

Direct textual evidence for the settlement of Judaeen communities (i.e., from Palestine) in Europe west of the Bosphorus is nonexistent in classical and secondary sources. By contrast, there is plentiful evidence for the presence of converts to Judaism in a broad network of early Jewish communities throughout the Roman (Latin)-, Byzantine (Greek)-, Slavic-, Spanish-, Germanic-, Turkic-, Arabic-, and greater Persian-speaking worlds. It is important to distinguish the conversion of individuals to some form of cultic or proto-Rabbinic Judaism from that of entire city-states. Since it is impossible at present to discuss specific lineages descending from known individual or group conversions, we will focus on the contingencies and trends associated with the latter.

It is not clear from textual sources that there was a single social or strategic advantage proffered by city-states (e.g., Nehardea) (Cohen 2010) and kingdoms such as Adiabene and Khazaria (assuming we can consider these to be mass conversions at all).¹⁴ Nor is it clear whether conversion at the city-state or kingdom level meant all subjects were forcibly converted or whether the ruling elite chose to politically realign themselves. Given the subsequent demographics of the areas in question (Iran, Iraq, Daghestan), it would seem the latter is more likely.¹⁵ Based on what is known about the political history and geography of these state-level conversions, it is easy to suspect the involvement of trading relationships.

For centuries before and after this time, Babylonian Jews established and maintained trading outposts throughout northern Syria, Mesopotamia, and Persian Anatolia (as well as Afghanistan and India), connecting Roman merchants to Parthia and to the Far East (Neusner 1963). Their synagogues also served as hospices for travelling co-religionists (Kraeling 1956). The rapid eastern ascendancy of the Hellenic world and the retreat of Persia would have meant the coming together of this mosaic of Persian Jewish and Greco-Roman Jewish convert populations in a single, albeit massive, subcontinental region.¹⁶ Such a process would have facilitated the transmission of Jewish culture, and with it some amount of gene flow, from the Levant without recourse to a forced expulsion, for which there is no direct textual evidence. Although Josephus (1978c VI:9:3) mentions that the number of those “carried captive” after the siege of Jerusalem was 97,000, as Sand (2009:131) points out, “Rome’s great Arch of Titus shows Roman soldiers carrying the plundered Temple candelabra—not . . . Judaeen captives carrying it on their way to exile. Nowhere in the abundant Roman documentation is there any mention of a deportation from Judaea” (see also Eck 1999 and Yuval 2006).

According to the letter to the envoy of ibn Shaprut, Judaism was brought to Khazaria from Armenia,¹⁷ not via Black Sea Jews (Golb and Pritsak 1982:130–31). It seems likely that these conversions to Judaism in western Eurasia were part of the game of alliance building and politicking—for much the same reasons as Ger-

manic, Slavic, and Altaic tribes were turned toward Christianity, and others toward Islam in those centuries. Alternatively, converts from Judaized regions could have been inculcated in the tradition by immigrants from Palestine or other centers of Jewish life. That is to say, they occurred as much for economic reasons as for those of community or personal prerogative.

Resistance to religious conversion is equally plausible. For example, Josef haCohen (1981:6–7) claims the Arab invasion of Persia in 690 CE was the impetus for a great many Persian Jews to migrate north into southern Russia, although this is otherwise difficult to substantiate. Some support for this view may come in the form of a mid-thirteenth- to mid-fourteenth-century Jewish cemetery that was recently discovered near the village of Eghegis in Syunik Mars, southern Armenia, with the identity and fate of this community remaining unknown (Brown 2001).

Baron (1952:170–71) provides another perspective on the social and strategic advantages of conversion. In his chapter entitled “Expansion of Judaism,” he describes the rapid, multidirectional, and decentralized expansion of Jews into Asia Minor and Europe. Since Baron does not cite his sources, it is difficult to determine whether he means the expansion of Jews per se, or, like the parallel expansion process in Christianity, of Judaism as an idea, through the work of converts.¹⁸ Although it cannot be said with any certainty that Persian Jewish migrants to Russia and the Caucasus had a lasting effect on the Ashkenazi Jewish population(s), the existence of both Persian and Greco-Roman Jewish communities in these locations ideally suited for trade administration (Neusner 1963; Isaac 1998) likely set the stage for subsequent settlement in Russia, the Balkans, Hungary, Western Europe, North Africa, and perhaps even parts of Central Asia and India.¹⁹

The Cairo Geniza documents (reviewable as numerous secondary sources, chiefly Goitein 1978) provide a rich picture of cosmopolitan Jewish middle-class life between the ninth century CE and the early modern era. The establishment of charitable organizations and synagogues, far-flung trade relationships (including slaves), the relaying of long-term messages and consummating of long-distance marriages, the back-immigration of Karaite Jews to Palestine (Goitein 1978:323), and a world otherwise teeming with Jewish migration and movement are all described. The notion of a Silk Route–based Judaism, though a more reductive model than we envision, has been gaining some traction in recent literature. Goldstein (2008:98), for example, interpreted the results of Jewish NRY and mtDNA studies as being “consistent with a story of Jewish men, perhaps traders along the Silk Road or the Arabian Peninsula, traveling long distances to establish small Jewish communities” and marrying local women. Tian et al. (2015:1) also noted the presence of some eastern Eurasian mtDNA haplotypes among Ashkenazi Jews that support “an East Asian genetic contribution, likely from Chinese.”

Taken together, these facts and trends open a new vista into political and socio-economic dynamics of Judaism in Western Asia, and the strategic reasons for associating with it during antiquity and the early Middle Ages. Alliance building, slavery,

long-distance trade, and the vicissitudes of empire, inasmuch as they certainly played their roles in the formation of other identity groups in Europe and the Middle East, offer a more complex but more cogent framework with which to interpret the mosaic pattern of Jewish genetic diversity.

The notion that certain European Jews originated in the Black Sea, Caucasus, or Persia (i.e., on the fringes of or outside the Roman Empire) is hardly new. In 1895, Samuel Weissenberg, a noted Russian Jewish physician and anthropologist, published *Südrussischen Juden: Eine anthropometrische Studie*, a long-form paper investigating the origins of Jews living in the region of his native Elizavetgrad (now Kirovohrad, in Ukraine). He concluded that, while German Jews had their origins in Franco-Jewish colonies, it was inconceivable that the five million Yiddish-speaking Jews of his day could have been the result of migrations from Central Europe to the Pale of Settlement (Weissenberg 1895). Through anthropometric analysis, Weissenberg asserted that these Jews were fundamentally physically different from the Jews of Europe and thus had originated in either the Greco-Roman colonies of the Black Sea and Mediterranean, from Persia via the Caucasus (i.e., Khazaria), or perhaps from both (Weissenberg 1895).

Although perhaps failing to take fully into account the resettlement in these regions of Sephardic Jews expelled from Iberia, Weissenberg's historical resolution to the question about southern Russian Jewish populations may have been based on knowledge in currency at that time, but which was later lost. Evidence for connections between the various and long-standing Judeo-Persian communities of Iran and elsewhere, especially the Caucasus and Russia, are indeed meager, even if Judeo-Tat is unequivocally a language with roots in southwestern Iran (Lazard 1968). While the ultimate origins of the various Persian Jewish communities are unknown—it is unclear whether they were founded by settlers from Palestine or Babylon, converts, or a combination of the two—their presence is documented as early as the sixth century BCE, with biblical reference to II Kings 17:6 and 25:11, an event supported by the Babylonian chronicles (Wiseman 1961:33–37). In any case, the Jewish presence in Persia has been long-standing enough for several distinct Judeo-Persian languages to accrue in relative isolation (Lazard 1968).

Although Weissenberg (1895) did not specify whether the Anatolian Jewish communities were converts per se, in noting its members were of a different physical type to Western European Jews, the implication is there.²⁰ However, he must have been aware of the great historical spread of Judaism throughout Asia Minor and the Black Sea region during the Hellenistic period. From Greek epigraphic and papyri sources, we know of scores of synagogues in Asia Minor, the northern Black Sea region (such as Acmonia, Amastris, Ephesus, Hyllarima, Miletus, Myndos, Nysa, Pergamum, Philadelphia, Phocaea, Priene, Sardis, Side, Smyrna, Teos, and Tralles: Feldman 1996; Kraabel 1979; Harland 2006), and southeastern Europe, chiefly in the Balkans, but also Hungary (e.g., Intercisa and Stobi; Mursa and Oescus: Feldman 1996; Kraabel 1979; Harland 2006). The famous Delos Synagogue also warrants mention in this

context (Matassa 2007). Although no membership lists (or even statements of function) for these synagogues exist, the communities they served cannot have been either small or transient.

Some researchers are of the opinion that, in the first centuries CE, the rate of conversion to Judaism in Rome was high (Bamberger 1939; Braude 1940; Rapaport 1965). Not for nothing was the word *προσήλυτος* defined in the Greek New Testament and Apocrypha as “newcomers to Judaism” (Conybeare 2006). However, despite the fact that the subject of proselytism in the Roman Empire is mentioned (often with palpable fear and disdain) in scores of classical texts,²¹ the most authoritative works on this subject (Goodman 1994; McGing 2002) suggest the number was not as great as these sources depict. The oft cited claim by Baron (1952) (see also Durand 1974) that between four and eight million Jews dwelled outside Palestine in the first century CE is difficult to substantiate. McGing (2002) comments on the tendentiousness of ancient sources regarding Jewish population and demography, especially those on which Baron’s estimates rely (10% of the entire Roman Empire). However, even when Baron’s lowest estimate is halved to two and a half million, it amounts to one-twentieth of the population of the entire Roman Empire according to the censuses of Augustus (Durand 1974; Wasserstein 1996). Such a ratio is unimaginable without the conversion of a large number of gentiles.

On this note, the well-known campaign to translate the Old Testament into the Greek dialect Koiné (Simon-Shoshan 2007), which served as the *lingua franca* for much of the Mediterranean region following the imperial consolidation of Alexander the Great in the fourth century BCE, must have been commissioned with converts to Judaism, not Christianity, in mind. More important than the numbers is the fact that there is no evidence for Hebrew as an everyday spoken language in Europe at all (Blumenkranz 1960:4), and virtually no evidence of its use there as a written language prior to the ninth century CE. This evidence would therefore suggest a tradition of local Jewish communities writing, speaking, and conducting their religious services in Greek.

In this regard, the Hebrew epigraphic corpus in Europe is miniscule, and what does exist is formulaic and repetitive between inscriptions, making it very difficult to date (de Lange 1996).²² However, an interesting piece of Roman legal history, authored by Justinian in 553 CE, lends further weight to the opinion that Greco-Roman proselytes were the founding Jewish community in Europe. The emperor’s legal opinion in this document explicitly favors the use of majority vernacular Greek language scripture and liturgy during an apparent Jewish intercommunity dispute over which language should dominate (Linder 1987; de Lange 1996). Where this dispute took place is unknown. Given the total lack of evidence for Hebrew scriptural readings in Constantinople, one might suppose Alexandria. The suggestion, therefore, is that some Hebrew-speaking Jewish communities existed alongside Greco-Roman ones.

The Hebrew liturgy eventually introduced to non-Sephardic Europe (date unknown, but probably sometime during the Geonic period) continues to generate debate as to its Palestinian or Babylonian characteristics (Gaster 1901–1903; Zunz

1966). If, in fact, elements of the Palestinian rite exist in the Ashkenazi liturgy, their source is unclear. According to de Lange (1996:134), there is no evidence for use of Hebrew liturgy even in Palestinian synagogues during the Roman period. Therefore, the rite was likely transmitted via Alexandria, along with a small population of Alexandrian Jews, possibly with some Romaniote connections.

IDENTITY AND JEWISH COMMUNITY FORMATION IN THE PAN-MEDITERRANEAN REGION

In his book-length essay on the history of Jewish identity, Shaye Cohen (1999) points out that Latin *Iudaeus*, Greek *Ιουδαίος*, and Hebrew יהודי are, after the end of the second century BC, always translated as “Jew,” meaning one who reveres the God of the Judaeans, whose temple was in Jerusalem (Cohen 1999:22–24). Prior to this time, these words were translated as meaning “Judaeans,” someone who hails from Judaea. Although by the Hellenistic period virtually all Judaeans were Jews (hence, the likely reason for the eventual conflation of these terms), a non-Jew could become *Ιουδαίος* by joining the Judaeans in the observation of Jewish religious precepts. Hence, the term seems to have come to include converts in the category of Jews even if they simply revered the God of the Jews (Cohen 1999; Kraemer 1989; 2 Maccabees 6:6 and 9:17).²³

In 2 Maccabees, a book written in Koiné Greek, most likely in Alexandria, we find the first reference to the term *ιουδαϊσμός*. Cohen discusses how this term does not mean “Judaism” in the sense of a designated religion, but rather “Judaeanness,” the aggregate of all qualities (including religious, *sensu stricto*) that make Judaeans Judaeans, similar to *Χελληνισμός*, which refers to the aggregate qualities that make Greeks Greek, but not exclusively religious ones (Cohen 1999; Mason 2007). This insight is important because, although many non-Judaeans Greco-Romans venerated the God of the Judaeans, they may not have considered themselves to be ethnic Jews except and until an “us/them” line was drawn. The term *ιουδαΐζειν* is most often used ambiguously (i.e., meaning to adopt the customs of the Jews or to side politically with the Jews) except in the writings of Paul, who employed the term specifically to mean the adoption of Jewish customs. Even here, the term does not necessarily refer to products of Judaeans influence, or even contact with other Jews, but rather the maintenance of Old Testament cultural practices, such as circumcision, keeping the Sabbath, Levitical purity, and so on (Cohen 1999).

Furthermore, the term may have been exonymic. What we can glean from the different usages of these terms is that many in the Greco-Roman world who “became Jewish” did so with varying degrees of contact with Levantine Jewish tradition, with their descendants becoming “ethnically” Jewish later (i.e., in the sense of maternal genealogy). In this regard, Cohen (1985) estimated that the transition from a paternal to a maternal lineage source of identity in Rabbinic Judaism occurred in the second century CE.

The substantial secondary literature that is focused on Hellenistic Jewish sources invariably refers to a diaspora with its roots in the Levant, and it often implied ethnic

and national distinctiveness (Barclay 1996; Gruen 1998, 2002; Tcherikover 1959). In part, this tendency is due to a perceived distinctiveness between contemporaneous Jewish literatures from Judaea, on the one hand, and that of the greater Hellenistic world (i.e., the Diaspora) on the other. Although the primary sources do paint a picture of distinct Jewish communities in Alexandria, Rome, Constantinople, and other cities, there is, in fact, very little information in the texts to suggest that these “diasporic” Jews were, in fact, immigrants from Palestine, as opposed to local peoples who practiced Judaism and constituted a distinct community (Aristeas 1905; Josephus 1978a I[22]:186–87, II[4]:33–35, 1978c II:487–88). Whatever the relationship between Hellenistic culture and post–Second Temple Judaism, it is by no means certain that these communities were composed of Levantine expatriates any more than were the contemporaneous early Christian communities.

This textual evidence should, instead, suggest that Judaism experienced Second Temple era popularity in Europe among non-Levantine, and apparently non-Hebrew-speaking, Europeans. While the exact number of Greco-Roman converts remains uncertain, it does seem that convert-mediated transmission of Judaism to continental Europe was running a parallel course to the spread of Christianity from the turn of the Common Era through late Byzantium and the early Middle Ages. It also seems clear that Europeans were associating with Jewish cults prior to the Common Era. The possibility that traders from elsewhere in the Jewish world settled in ports such as Cádiz, Seville, Lisbon, Marseilles, and Venice contributed to these early cult associations is also worth consideration. Nevertheless, the archaeological and textual evidence points to a Greek-speaking Jewish population in Southern Europe and parts of North Africa (Cohen 1989, 1999:1–10), including Egypt (Gruen 2002:183–200), where “native” Alexandrian Jews were distinguished, according to Philo, from Jewish “settlers” arriving from abroad (Wolfson 1944; Patai 1996).

The question then becomes to what extent the Greco-Roman Jewish communities of Asia Minor, the Black Sea region, the Balkans, North Africa, and perhaps elsewhere survived to contribute to the genesis of Ashkenazim and Sephardim, and how many of them subsequently succumbed to the pressures of rising state Christianity. There is also the question of whether Jews (including converts) were expelled from Rome at various times in the first and second centuries CE (Cappelletti 2006). Although it would be tempting to suggest the Ashkenazi tradition and identity were born of variegated Roman Jewish migrants to the Rhine in the waning days of Byzantium, the “miraculous,” or rather highly unlikely, trend in population growth among the Ashkenazim, at a rate of 1.7% between 1500 and 1700 (see van Straten 2011, 2015 for a critique of this notion), make this Rhineland Hypothesis seem inadequate.²⁴

Perhaps more importantly, European Jews found both an accelerated mobility and increased social cohesiveness during the sixteenth through eighteenth centuries in Europe (Ruderman 2010). When considering settlements of Ashkenazi Jews along the Rhine, we must contend not only with this riverine system as a trading highway,

along which goods flowed inland from Italy, but also as a route for the transmission of Rabbinical Judaism—the outgrowth of Pharisaic Judaism, that is, the Judaism of New Testament-era Palestine—throughout Europe, and its predominance among other Hellenistic and post-Hellenistic Judaisms of the day.

There is also some documentary evidence, obscure though it may be, for very early Jewish communities in various parts of Eastern Europe, particularly Pannonia and elsewhere in Roman Hungary (Patai 1996). Besides the aforementioned evidence of synagogue architecture in Intercisa and Stobi, grave and monumental epigraphy and religious objects attest to their presence in the second or third century CE. The evidence largely suggests that Jewish soldiers in the Roman Army settled these communities. Patai (1996:24–25) theorizes that Sassanid Persian pressure against the eastern borders of the Roman Empire caused a western influx of Jews to Thrace and Pannonia, and presumably elsewhere in Europe, where they enjoyed full security. After the Romans abandoned Pannonia, the fate of these Jewish communities is unknown. The first literary evidence for Jews in Hungary does not appear until 953 CE, with documentation of the arrival of a Croatian delegation in Cordoba (Patai 1996:29–30).

The persistence of convert communities may, in part, explain the existence of Knaanic, a Western Slavic language related to Czech and Moravian, and thus of a Judeo-Slavic ethnos living east of the Elbe River. The existence of this language is indicative of a long presence in Eastern Europe, long enough at least for such a language to become its own, apparently without a Hebrew substratum. Since several medieval Hebrew texts (including some by Rashi) were glossed in Knaanic/Old Czech, this Jewish community must have been both observant and literate (Kearney 2010).

Jews elsewhere in former Roman territories (i.e., those inherited by Ottoman Turks) would have been subject to *sürgün*, the periodic demographic reordering of the empire for reasons of military, economic, and interethnic stability (Hooper 2003). According to Kaleb Afendopoulo, a fifteenth-century Karaite scholar living in Constantinople, Sultan Mehmed Murat relocated all of the Jews in the empire to the capital city in 1455 CE (Bowman 1985:325, citing Danon 1926). Even if this was not truly a wholesale relocation, the number of Jews involved in this relocation could not have been insignificant.

Notably, this event occurred less than a century after efforts on the part of the various Orthodox churches in the Balkans to curb the spread of Jewish settlements and Judaization there (Bowman 1985). Converts to Judaism were officially condemned during the Council of Trnovo in 1360 CE (Fine 1987), and this “Judaizing Heresy” was not limited to the southern Slavic states. In Russia, Judaizing tendencies had become so widespread in the fifteenth century that pogroms and bans on Jewish settlements ensued (Vernadsky 1933; Halperin 1975).²⁵

Although well documented, their presence is, again, not to suggest they had a significant genetic or intellectual impact on contemporary Jewry. Rather, it is to note their location in time and space, as Gardette (2012) does, parallel to similar move-

ments in Turkey, Bulgaria, Serbia, and Russia at the turn of the sixteenth century. This was a time when Jewish conversion in Europe had allegedly ended for good, and it marked the “so-called demographic miracle of population expansion from 50,000 [Ashkenazi Jews] at the beginning of the fifteenth century to 5,000,000 people at the beginning of the nineteenth century” (Atzmon et al. 2010:850).

Whatever their connection to Byzantine Jewish communities, Khazars controlled trade along the Dnieper, Don, and Volga rivers—a portion of land wedged between Byzantium and the land of the Rus, the latter of which eventually knelled death to the Khazar Empire around 965 CE (Golden 2007). Thus, it is not difficult to imagine Jews from varying backgrounds settling into trading posts all along the Dnieper and the roads leading into Baltic lands and Germany. In fact, the Solomon bar Simson Chronicle describes Crusader-era massacres (ca. 1096 CE) in the well-established Jewish communities of Mainz, Worms, and Speyer, and elsewhere along the Rhine, as well as in Trier, Regensburg, Mehr, and Prague, and in Bohemia (bar Simson 1977). Of potential sources for Jewish populations and the specific land and riverine routes they may have taken into Eastern Europe and the Pale of Settlement, there are numerous possibilities. Jewish westerly migration and settlement is, however, at present, not well attested in the literature.

Jewish merchants and slave-traders abounded in antiquity all across Eurasia (Hezser 2005). Perhaps the best documented of these were the Radhanites, a loosely confederated group of mobile multilingual Jewish traders who seemed also to have been experts on route geography and social relations. Gil (1974) proposes, based on Heyd (1885–1886), that they were Arabic-speaking Jews from Radhan, a village that once existed in southern Iraq, and were successful not because of their incorporation but because of a network of Jewish settlements all across Eurasia, with whom they cooperated. Following the loss of their monopolies at the end of the tenth century CE due to the rise of Genoa and Venice and to others whose sea blockades and anti-Jewish campaigns destroyed their competition (Rabinowitz 1948), they may have resettled in Mesopotamia, or moved on to Europe. The extent of the great network of Eurasian Jewish communities, particularly those in Russia, on whom they must have relied, is not clear. However, we do know from numerous literary attestations that conversion to Judaism continued in parts of Europe well into the twelfth century CE (Wacholder 1958), not only among Christians but also—and perhaps more importantly—among slaves (many of whom were Slavs) owned by Jews (Wacholder 1956).

CONCLUSIONS

The summary trend in the population genetics literature is that the contemporary Jewish community has no single ancestral center but rather is formed of heterogeneous, geographically dispersed sources. Despite the presumptive language used in a few of the scientific papers, the genetic data collectively point not to a singular Levantine origin or a Khazar diminution but instead to a mosaic of Western Asian

and autochthonous European sources for modern Jewish populations, one which includes Anatolian, Persian, Slavic, and circum-Mediterranean components, including the Levant, and with a very strong case for conversion to Judaism by autochthonous European women (Costa et al. 2013). The autosomal, sex chromosomal, and mtDNA study by Zoosmann-Diskin (2010) and the admixture history study of Xue et al (2017) together reinforce both the Mediterranean area (specifically Italy) as a possible geographic locus for European Jewish ethnogenesis, and the fact that the various contemporary Jewish populations do not share a common ancestor.

This trend is reinforced by a survey of secondary sources on Jewish conversion, which leave a clear impression that peoples from a wide variety of places in Eurasia were converting to Judaism for an equally great variety of reasons. Judaism is known to have been a proselytizing religion, especially during the first two centuries of the Common Era, but also into the Middle Ages (e.g., Cohen 1989, 1999; Golb 1988; Golb and Pritsak 1982; Goodman 1989; Gruen 2002; Leonhardt-Balzer 2007; Ruderman 2010; Schwartz 2007; Vernadsky 1933; see Stern 1974 for a review of references to Jewish proselytism in classical literature). Conversions to Judaism by traders for reasons of business acumen are also documented (Baron 1952; Gil 1974; Rabinowitz 1948). Therefore, it is logical to propose that contributions from various West Asian and European converts should be visible in the genetic record.

Judaism is a belief system with multiple traditions and histories. The origins of its populations are likewise multiple. Its expansion within Eurasia was likely, until the Middle Ages, a very similar process to that of Christianity—predicated upon conversion, not the spread and settlement of an original group of religionists from Palestine. Those genetic and historical studies based on an assumption that Jewish populations should genetically cohere misapprehend the complexity of Jewish history—from antiquity through the Middle Ages, from Rome to Babylon, Alexandria to Vilnius—and in doing so underestimate the extent to which numerous populations contributed to what eventually came to be known as the Jewish people. These findings should provide further impetus for continued research into not only the nearly three-hundred-year-old question of Jewish ethnogenesis but also the nature of historiographic concepts themselves. Stated differently, if we are to accept that Jewish ethnogenesis was a complex and multicentered process—with contributions from diverse Western Asian and autochthonous European populations and thus taking place more in the “diaspora” than in the “homeland”—then we must also reconsider the historical geography of the Jewish diaspora and homeland.

NOTES

The drafting of this manuscript was supported by funding from the Bryn Athyn College’s Carpenter Grant. The authors would also like to thank to Drs. Aaron Brody, Jill Gaieski, Michel Shamooun-pour, and Noah Tamarkin, and Mr. Akshay Walia, as well as several anonymous reviewers, for their constructive comments on this manuscript in its various incarnations. AY conceived of the study and conducted histor-

ical and archival research for it; AY and TGS wrote the manuscript. Both authors read and approved the final manuscript.

1. The term typically refers to any direct descendants of the biblical patriarch Jacob (including Samaritans). In this usage, it also includes Cohens and Levites, who were otherwise viewed as being distinctive.

2. As part of a larger effort by to identify distinct and hierarchical races among humans, German physical anthropologists such as Blumenbach (1775) and Rudolphi (1812) noted physical differences that they considered to be unique to and consistent within what they took to be a homogenous Jewish population, and that set them apart from other Europeans. Although offering no theories concerning the “racial” classification of Jews, mid-nineteenth-century Jewish historiographic works also strongly supported a sense of cultural, or ethnic, distinctiveness among them (even as they occasionally endorsed social assimilation).

3. Textual details regarding the formation of the three geographic or liturgical zones (Sephardi, Ashkenazi, and Mizrahi) of Jewish tradition are scant through the Middle Ages (sixth through sixteenth centuries CE), and found mostly in non-Jewish sources since Jewish historiography itself was almost nonexistent prior to the mid-nineteenth century (Yerushalmi 1982). Given this historiographical gap, the question of the origins of modern Jewish populations has been difficult to resolve. It is this uncertainty that has given rise to both the mainstream theories of a Judean ancestry for contemporary Jewry and to alternative theories, such as the Khazar Hypothesis (Behar et al. 2013; Elhaik 2012; Koestler 1976). Neither of these theories, in their simplest forms, are supportable by current evidence.

4. “Semitic” and “non-Semitic” are terms with no meaning outside linguistics (Anidjar 2008:6), but presumably the authors are referring to the Hebrew-speaking tribes of the Iron Age Levant, and whatever descendants they may have in the region.

5. These are methods that measure the proportion of genetic ancestry deriving from specific geographic areas (Alexander et al. 2009; Alexander and Lange 2011).

6. In the PCA plot from Behar et al. (2010), Levantine populations (Samaritans and Druze but not Palestinians, Jordanians, Lebanese, or Syrians) were remarkably close to some Jewish individuals. However, most Ashkenazi Jewish individuals were positioned outside the Levantine cluster. More importantly, in figure 2 from this same paper, Jewish populations were positioned closer to the “host” populations than to each other, and without intermediate individuals, which hardly is suggestive of a population with centralized ancestry.

7. While, on the one hand, stating, “the time frame for the split from Middle Eastern populations is beyond the detection power of our IBD analysis” (Behar et al. 2013:29), the authors claimed that the founding lineages likely belonged to a “Hebrew/Levantine mtDNA pool” despite nothing in the data set suggesting either an “ancestral” pool or a subsequent “split” within it. In an earlier analysis of genomic data, Behar et al. (2010:239–40) made similar statements about “ancestral Levantine con-

tribution to much of contemporary Jewry” and consistency “with historical records describing the dispersion of the people of ancient Israel throughout the Old World.”

8. This finding supported the interpretation of founder effects coming from previous studies (Behar et al. 2004b), although the limited number of founding lineages, per se, may belie a set of circumstances lost to the historical record. For example, it is possible the mass destruction of Jewish communities throughout Europe during the Crusades (Eidelson 1977; Malkiel 2001), the Black Death, and the Shoah reduced genetic diversity in these populations.

9. The idea that conversions to Judaism took place was also highlighted in other studies. In a study of Y chromosome and mtDNA diversity in Jewish and European “host” populations, Thomas et al. (2002:1417) observed “greatly reduced mtDNA diversity” in the former populations. The view that Ashkenazi mtDNA lineages are largely autochthonous European in origin is also supported by a study of a breast cancer-causing variant (BRCA1 mutation c.5266dupC) among Europeans. In this analysis, Hamel et al. (2011) showed that the c.5266dupC mutation arose in a single common haplotype in Europeans well before becoming a founder mutation in Ashkenazi Jews some 400–500 years ago. Their data further suggested that all carriers of this mutation derived from “a single founder individual who lived around 1800 years ago in either Scandinavia or what is now northern Russia” (Hamel et al. 2011:300). (See also Levy-Lahad et al. 1997; Risch et al. 2003; Rosenthal et al. 2015 for research into Ashkenazi disease variants shared with other European populations.)

10. For example, Atzmon et al. (2010) observed that the sampled populations (Ashkenazi Jews, Greeks, Iranians, Iraqis, Italians, Syrians, and Turks) shared a common Middle Eastern background and, as such, remained largely genetically indistinguishable from one another. This observation is especially important because it speaks to the potential for shared ancestry for all of these populations in deep history, and thus to the ambiguity surrounding claims of “Middle Eastern” ancestries for Jewish populations.

11. The application of the χ^2 test to an aggregated population of Russians, Germans, and Austrians, rather than treating each of these groups as multi-normal data sets (Holt et al. 1980), likely produced skewed results. This analysis also assumed Ashkenazi Jews were a single population to begin with.

12. The information used in this study included NRY data from 12 Samaritan males, mtDNA data from 16 Samaritan individuals, and comparative data from 18 to 20 male individuals each representing Ethiopian, Ashkenazi, Iraqi, Libyan, Moroccan, and Yemenite Jews, as well as Druze and Palestinians.

13. DNA sequences obtained from a variety of Jewish mortuary contexts (Brody and King 2013; Salamon et al. 2010), or even Natufian or other Neolithic/Bronze Age Levantine populations (e.g., Lahr and Haydenblit 1995; Webb and Edwards 2002; Haber et al. 2017), would provide useful information about the nature of genetic diversity that is at the root of the Jewish ethnogenesis narrative. This problem cannot be approached analytically in the way that Elhaik (2012) attempted.

14. The conversion of the Kingdom of Adiabene to Judaism during this same century (chronicled in Josephus 1978b XX:17–95; see also Neusner 1964a, 1964b) might also be seen as an important transition in Jewish demography. However, as with Khazaria, it is impossible to determine to what social depth this conversion carried weight. The importance of recognizing the existence of this small and ephemeral Jewish sovereign state is not in the suggestion that it had any impact on the modern Jewish gene pool but rather to note its geographic location—on the fringes of empire—at a time when Arsacid Iran was fighting to maintain and expand its grip on Asia Minor (Bivar 1983).

15. The case of Yemen might be different from the others (Lecker 1995; Tobi 1999).

16. The literature on Hellenistic Seleucid and later Greco-Roman (including Byzantine) Jewry is substantial and draws on rabbinical (e.g., Baron 1952; Finkelstein 1933; Rapaport 1965), Greco-Roman (e.g., de Lange 1996; Derwacter 1930; Rajak 1996; Trebilco 1991), and other (e.g., Lasker 1990) sources, although it is longer on textual criticism than on social details. These communities seem to have been a mix of voluntary and compulsory resettlement—the latter of which was certainly the case with the Edomites and Idumeans (Richardson 1996).

17. This reference should be taken to mean not just the small South Caucasus state of modern Armenia but the kingdom of Bagratid Armenia, which at the time of ibn Shaprut would have bordered or included the region of “Ashkenaz” Anatolia proposed by Das et al. (2016).

18. Judging by the tenor of his narrative, Baron himself seems convinced that the Jews of Alexandria, Babylon, Armenia, and Asia Minor (though not Europe) were settlers, not converts; without source texts beyond Josephus, however, these assumptions cannot be explained or verified.

19. St. Hieronymus (Jerome) describes the trajectory of Jewish “dispersal” as extending “from Mauretania, through Africa and Egypt, Palestine and Osroene, Mesopotamia and Persia—as far as India” (quoted in Dubnow 1968:202). The judgment of this early church father against the Jews, for their sins as Christ-killers, lends weight to the notion that the idea of Jewish dispersal itself originates in the myth of their punishment by God, a trope familiar from Genesis 11:1.

20. In Asia Minor, a great deal of Jewish resettlement occurred during the Seleucid period (312–63 BCE), although this appears to have involved Jews from Babylon and Mesopotamia, not Judaea itself (Josephus 1978b XII:148–53; Trebilco 1991). There is also evidence of Jewish proselytizing in the pan-Mediterranean region from this time until the early Middle Ages in both Europe and Asia Minor, as well as individual and mass conversions to Judaism further east (Gil 1974; Golden 2007; Neusner 1964a, 1964b; Rabinowitz 1948). The presence of “God-fearers” and other syncretic Jewish cults in Asia Minor is also well documented (Gardette 2012), although their social relationships with the Jewish world at large is uncertain.

21. References to converts to Judaism are numerous in classical authorship, both historical and literary. In fact, they are too numerous to list exhaustively here. For a

few salient examples, see Tacitus *Annales* 13:32:2 and 85; Seneca *De Superstitione* as quoted in Augustine *De Civitate Dei* VI:10; Cassius Dio *Historia Romana* LVII 18:5 and LXVII:14:1–3; Juvenal *Saturae* XIV; Horace *Sermones* 1:4:139–43. For a review of Talmudic and Midrashic passages on the propagation of Judaism in senatorial circles, see Bamberger (1939). For evidence of Jewish proselytism BCE, see, for example, Valerius Maximus *Facta et Dicta Memorabilia* III:3:3, as well as Matthew 23:15.

22. de Lange (1996:127–28) provides a review of the few ca. sixth-century non-formulaic Hebrew inscriptions, including an epitaph. The post-ninth-century literature, concentrated mainly in southern Italy, does not offer any indication of the identities of the authors or scribes, except perhaps in one case. Frey no. 569/570 (see de Lange 1996:130–31) are two adjoining bilingual Latin/Hebrew epitaphs, one written in memory of Vita, son of Faustina, the other, of Pretiosa, daughter of Faustina. The use of the word θρήνος (“dirge” or “wail”) suggests to de Lange (1996:131) that Greek was still the liturgical language among the Jews of Venosa.

23. Our understanding of *Ioudaίoi* and the self-definition of early Rabbinical Judaism vis-à-vis Christianity are made all the more complex through a reading of Justin’s *Dialogue*. See Boyarin (2004) for a discussion of Justin’s discourse on Logos and its relationship to early Judaism and Christianity.

24. Shaul Stampfer’s (2014) rebuttal of van Straten cites Afrikaners and French Canadians as examples of populations that successfully increased at high rates in a few centuries, although it is not clear that either of these populations could have done so without intermarriage and cultural “conversion.”

25. In fact, these so-called Judaizing Christians were largely an Anatolian phenomenon, the existence of which is known to us mainly through the writings of the Eastern Fathers, who considered them heretical (Gardette 2012). Their appearance in the historiographic record comes much later, beginning in the fifth century CE, and they are mentioned as late as the fourteenth century (Gouillard 1965; Meyendorff 1966; Oeconomos 1918; Sharf 1971). They are not converts or proselytes in the same sense as the movements in the Roman Empire to the west, as some sects behaved more as syncretic or heretical Christians than Rabbinical Jews or Karaites, while others’ recourse to recognizable Jewish practices was more faithful (Gardette 2012).

REFERENCES CITED

- Alexander, David H., and Kenneth Lange. 2011. Enhancements to the ADMIXTURE algorithm for individual ancestry estimation. *BMC Bioinformatics* 12:246.
- Alexander, David H., John Novembre, and Kenneth Lange. 2009. Fast model-based estimation of ancestry in unrelated individuals. *Genome Research* 19:1655–64.
- Anidjar, Gil. 2008. *Semites: Race, religion, literature*. Stanford: Stanford University Press.
- Aristeas. 1905. *Letter of Aristeas*. H.S.J. Thackeray, trans. London: Macmillan.
- Atzmon, Gil, Li Hao, Itsik Pe’er, Christopher Velez, et al. 2010. Abraham’s children in the genome era: Major Jewish diaspora populations comprise distinct genetic clusters with shared Middle Eastern ancestry. *American Journal of Human Genetics* 86(6):850–59.

- Bamberger, Bernard J. 1939. *Proselytism in the Talmudic period*. Cincinnati: Hebrew Union College Press.
- Barclay, John M. G. 1996. *Jews in the Mediterranean Diaspora: From Alexander to Trajan (323 BCE – 117 CE)*. Edinburgh: T and T Clark.
- Baron, Salo. 1952. *A social and religious history of the Jews*, Vol. 1. Philadelphia: Jewish Publication Society of America.
- bar Simson, Solomon. 1977. "The chronicle of Solomon bar Simson," in *The Jews and the Crusaders: The Hebrew chronicles of the First and Second Crusades*. Edited and translated by Shlomo Eidelberg, pp. 20–72. Madison: University of Wisconsin Press.
- Behar, Doron M., Mark G. Thomas, Karl Skorecki, et al. 2003. Multiple origins of Ashkenazi Levites: Y chromosome evidence for both Near Eastern and European ancestries. *American Journal of Human Genetics* 73(4):768–79.
- Behar, Doron M., Daniel Garrigan, Matthew E. Kaplan, et al. 2004a. Contrasting patterns of Y chromosome variation in Ashkenazi Jewish and host non-Jewish European populations. *Human Genetics* 114(4):354–65.
- Behar, Doron M., Michael F. Hammer, Daniel Garrigan, et al. 2004b. MtDNA evidence for a genetic bottleneck in the early history of the Ashkenazi Jewish population. *European Journal of Human Genetics* 12(5):355–64.
- Behar, Doron M., Ene Metspalu, Toomas Kivisild, et al. 2006. The matrilineal ancestry of Ashkenazi Jewry: Portrait of a recent founder event. *American Journal of Human Genetics* 78(3):487–97.
- Behar, Doron M., Bayazit Yunusbayev, Mait Metspalu, et al. 2010. The genome-wide structure of the Jewish people. *Nature* 466(7303):238–42.
- Behar, Doron M., Mait Metspalu, Yael Baran, et al. 2013. No evidence from genome-wide data of a Khazar origin for the Ashkenazi Jews. *Human Biology* 85(6):859–900.
- Behar D. M., Saag L, Karmin M, et al. 2017. The genetic variation in the R1a clade among the Ashkenazi Levites' Y chromosome. *Scientific Reports* 7(1):14969.
- Bivar, A. D. H. 1983. "The political history of Iran under the Arsacids," in *The Cambridge history of Iran*, Vol. 3(1). Edited by Ehsan Yarshater, pp. 21–99. Cambridge: Cambridge University Press.
- Blumenbach, J, F. 1775. *De generis humani varietate nativa*. Göttingen: Vandenhoeck et Ruprecht.
- Blumenkranz, Bernhard. 1960. *Juifs et chrétiens dans le monde occidental, 430–1096*. Paris: Mouton.
- Bowman, Steven. 1985. *The Jews of Byzantium (1204–1453)*. Tuscaloosa, AL: University of Alabama Press.
- Boyarin, Daniel. 2004. *Border lines: The partition of Judaeo-Christianity*. Philadelphia: University of Pennsylvania Press.
- Braude, William G. 1940. *Jewish proselyting in the first five centuries of the common era: The age of the Tannaim and Amoraim*. Providence, RI: Brown University Press.
- Bray, Steven M., Jennifer G. Mulle, Anne F. Dodd, et al. 2010. Signatures of founder effects, admixture, and selection in the Ashkenazi Jewish population. *Proceedings of the National Academy of Sciences (USA)* 107(37):16222–27.
- Brody, Aaron, and Roy King. 2013. Genetics and the archaeology of ancient Israel. *Human Biology* 85(6):925–39.

- Brown, Frank. 2001. Stones from the river. *The Jerusalem Report* (Sept. 24).
- Campbell, Christopher L., Pier F. Palamara, Maya Dubrovsky, et al. 2012. North African Jewish and non-Jewish populations form distinctive, orthogonal clusters. *Proceedings of the National Academy of Sciences (USA)* 109(34):13865–70.
- Cappelletti, Silvia. 2006. *The Jewish community of Rome: From the second century B.C. to the third century C.E.* Leiden: Brill.
- Carmi, Shai, Ken Y. Hui, Ethan Kochav, et al. 2014. Sequencing an Ashkenazi reference panel supports population-targeted personal genomics and illuminates Jewish and European origins. *Nature Communications* 5:4835.
- Cinnioglu, Cengiz, Roy King, Toomas Kivisild, et al. 2004. Excavating Y-chromosome haplotype strata in Anatolia. *Human Genetics* 14:127–48.
- Cohen, Barak S. 2010. “In Nehardea where there are no heretics’: The purported Jewish response to Christianity in Nehardea (A re-examination of the Talmudic evidence),” in *Studies in Rabbinic Judaism and early Christianity: Text and context*. Edited by Dan Jaffé, pp. 29–44. *Arbeiten zur Geschichte des antiken Judentums und des Urchristentums* 74. Leiden: Brill.
- Cohen, Shaye J. D. 1985. The origins of the matrilineal principle in Rabbinic law. *Association for Jewish Studies Review* 10(1):19–53.
- . 1989. Crossing the boundary and becoming a Jew. *Harvard Theological Review* 82(1):13–33.
- . 1999. *The beginnings of Jewishness: Boundaries, varieties, uncertainties*. Berkeley: University of California Press.
- Conybeare, F. C. 2006 (1896). *The acts of Pilate*. Piscataway, NJ: Gorgias Press.
- Costa, Marta D., Joana B. Pereira, Maria Pala, et al. 2013. A substantial prehistoric European ancestry amongst Ashkenazi maternal lineages. *Nature Communications* 4:2543.
- Danon, Abraham. 1926. Documents relating to the history of the Karaites in European Turkey. *Jewish Quarterly Review* 17(2):165–98.
- Das, Ranajit, Paul Wexler, Mehdi Pirooznia, and Eran Elhaik. 2016. Localizing Ashkenazic Jews to primeval villages in the ancient Iranian lands of Ashkenaz. *Genome Biology and Evolution* 8(4):1132–49.
- de Lange, Nicholas. 1996. “The Hebrew language in the European diaspora,” in *Studies on the Jewish Diaspora in the Hellenistic and Roman periods*. Edited by Benjamin H. Isaac and Aharon Oppenheimer, pp. 111–37. Ramot: Tel-Aviv University.
- Derwacter, Frederick M. 1930. *Preparing the way for Paul: The proselyte movement in later Judaism*. New York: Macmillan.
- Di Giacomo, F., F. Luca, L.O. Popa, et al. 2004. Y chromosomal haplogroup J as a signature of the post-Neolithic colonization of Europe. *Human Genetics* 115(5):357–71.
- Dubnow, Simon. 1968. *History of the Jews*, vol. 2. Moshe Spiegel, trans. South Brunswick, NJ: T. Yoseloff, Inc.
- Durand, John D. 1974. *Historical estimates of world population: An evaluation*. Philadelphia: University of Pennsylvania, Population Studies Center.
- Eck, Werner. 1999. The Bar Kokhba Revolt: The Roman point of view. *Journal of Roman Studies* 89:76–89.
- Eidelberg, Shlomo. 1977. *The Jews and the Crusaders: The Hebrew chronicles of the First and Second Crusades*. Madison: University of Wisconsin Press.

- Elhaik, Eran. 2012. The missing link of Jewish European ancestry: Contrasting the Rhineland and the Khazarian hypotheses. *Genome Biology and Evolution* 5(1):61–74.
- Feder, Jeanette, Ofer Ovadia, Benjamin Glaser, and Dan Mishmar. 2007. Ashkenazi Jewish mtDNA haplogroup distribution varies among distinct subpopulations: Lessons of population substructure in a closed group. *European Journal of Human Genetics* 15(4):498–500.
- Feldman, Louis H. 1996. “Diaspora synagogues: New light from inscriptions and papyri,” in *Studies in Hellenistic Judaism. Arbeiten zur Geschichte des antiken Judentums und des Urchristentums*. Edited by Louis H. Feldman, pp. 577–602. Leiden: Brill.
- Fine, John Van Antwerp. 1987. *The Late Medieval Balkans: A critical survey from the late twelfth century to the Ottoman conquest*. Ann Arbor: University of Michigan Press.
- Finkelstein, Louis. 1933. The institution of baptism for proselytes. *Journal of Biblical Literature* 52(4):203–11.
- Gardette, Philippe. 2012. “The Judaizing Christians of Byzantium: An objectionable form of spirituality,” in *Jews in Byzantium: Dialectics of minority and majority cultures*. Edited by Robert Bonfil, pp. 587–611. Leiden: Brill.
- Gaster, Moses, ed. 1901–1903. *Book of prayer and order of service, according to the custom of the Spanish and Portuguese Jews*, Vol. I. London: H. Frowde.
- Gil, Moshe. 1974. The Radhanite merchants and the land of Radhan. *Journal of the Economic and Social History of the Orient* 17(3):299–328.
- Gilbert, Martin. 2006. *The Routledge atlas of Jewish history*. London: Routledge.
- Goitein, Shelomo Dov. 1978. *A Mediterranean society. The Jewish communities of the Arab world as portrayed in the documents of the Cairo Geniza, vol. II: The community*. Berkeley: University of California Press.
- Golb, Norman. 1988. *Jewish proselytism: A phenomenon in the religious history of early medieval Europe*. Cincinnati: University of Cincinnati Judaic Studies Program.
- Golb, Norman, and Omeljan Pritsak. 1982. *Khazarian Hebrew documents of the tenth century*. Ithaca: Cornell University Press.
- Golden, Peter B. 2007. “The conversion of the Khazars to Judaism,” in *The world of the Khazars: New perspectives. Selected papers from the Jerusalem 1999 International Khazar Colloquium hosted by the Ben Zvi Institute*. Edited by Peter B. Golden, András Róna-Tas, and Haggai Ben-Shammai, pp. 123–62. Leiden: Brill.
- Goldenberg, Robert. 2007. *The origins of Judaism: From Canaan to the rise of Islam*. Cambridge: Cambridge University Press.
- Goldstein, David B. 2008. *Jacob’s legacy: A genetic view of Jewish history*. New Haven: Yale University Press.
- Goodman, Martin. 1989. Proselytising in Rabbinic Judaism. *Journal of Jewish Studies* 40:175–85.
- . 1994. *Mission and conversion proselytizing in the religious history of the Roman Empire*. Oxford: Oxford University Press.
- Gouillard, Jean. 1965. L’hérésie dans l’empire byzantine des origines au XIIe siècle. *Travaux et Mémoires*, pp. 299–324. Paris: E. de Boccard.
- Graetz, Heinrich. 1893. *History of the Jews*, vol. II. Philadelphia: The Jewish Publication Society of America.
- . 1894. *History of the Jews*, vol. III. Philadelphia: The Jewish Publication Society of America.

- Gruen, Erich S. 1998. *Heritage and Hellenism: The reinvention of Jewish tradition*. Berkeley: University of California Press.
- . 2002. *Diaspora: Jews amidst Greeks and Romans*. Cambridge: Harvard University Press.
- Haak, Wolfgang, Iosef Lazaridis, Nick Patterson, et al. 2015. Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522(7555):207–11.
- Haber, Marc, Dominique Gauguier, Sonia Youhanna, et al. 2013. Genome-wide diversity in the Levant reveals recent structuring by culture. *PLoS Genetics* 9(2):e1003316.
- Haber, Marc, Claude Doumet-Serhal, Christiana Scheib, et al. 2017. Continuity and admixture in the last five millennia of Levantine history from ancient Canaanite and present-day Lebanese genome sequences. *American Journal Human Genetics* 101(2):274–282.
- HaCohen, Joseph (and the Anonymous Corrector). 1981. *The vale of tears (Emek Habacha)*. Harry S. May, trans. Netherlands: Martinus Nijhoff.
- Halperin, Charles J. 1975. Judaizers and the image of the Jew in medieval Russia: A polemic revisited and a question posed. *Canadian-American Slavic Studies* 9:141–55.
- Hamel, Nancy, Bing-Jian Feng, Lenka Foretova, Dominique Stoppa-Lyonnet, Steven A. Narod, Evgeny Imyanitov, Olga Sinilnikova, et al. 2011. On the origin and diffusion of BRCA1 c.5266dupC (5382insC) in European populations. *European Journal of Human Genetics* 19:300–306.
- Hammer, Michael F., Alan J. Redd, Elizabeth T. Wood, et al. 2000. Jewish and Middle Eastern non-Jewish populations share a common pool of Y-chromosome biallelic haplotypes. *Proceedings of the National Academy of Sciences (USA)* 97(12):6769–74.
- Hammer, Michael F., Doron M. Behar, Tatiana M. Karafet, et al. 2009. Extended Y chromosome haplotypes resolve multiple and unique lineages of the Jewish priesthood. *Human Genetics* 126(5):707–17.
- Harland, Philip A. 2006. Acculturation and identity in the Diaspora: A Jewish family and “pagan” guilds at Hierapolis. *Journal of Jewish Studies* 57(2):222–44.
- Herrera, Kristian J., Robert K Lowery, Laura Hadden, et al. 2012. Neolithic patrilineal signals indicate that the Armenian plateau was repopulated by agriculturalists. *European Journal of Human Genetics* 20(3):313–20.
- Heyd, Wilhelm. 1885–1886. *Histoire du commerce du Levant au moyen-âge*, 2 vols. Leipzig: O. Harrassowitz.
- Hezser, Catherine. 2005. *Jewish slavery in antiquity*. Oxford: Oxford University Press.
- Holt D., A. J. Scott, and P. D. Ewings. 1980. Chi-squared tests with survey data. *Journal of the Royal Statistical Society, A* 143(3):303–20.
- Hooper, Paul L. 2003. *Forced population transfers in early Ottoman imperial strategy: A comparative approach*. PhD dissertation, Princeton University.
- Isaac, Benjamin. 1998. *The Near East under Roman rule: Selected papers*. Leiden: Brill.
- Josephus. 1978a. “Against Apion,” in *Complete works*. William Whiston, trans. Grand Rapids, MI: Kregel Publications.
- . 1978b. “Antiquities of the Jews,” in *Complete works*. William Whiston, trans. Grand Rapids, MI: Kregel Publications.
- . 1978c. “The wars of the Jews,” in *Complete works*. William Whiston, trans. Grand Rapids, MI: Kregel Publications.

- Karlin, Samuel, Ron Kenett, and Batsheva Bonn -Tamir. 1979. Analysis of biochemical genetic data on Jewish populations, II: Results and interpretations of heterogeneity indices and distance measures with respect to standards. *American Journal of Human Genetics* 31:341–65.
- Kearney, Jonathan. 2010. *Rashi: Linguist despite himself: A study of the linguistic dimension of Rabbi Solomon Yisbaqi's commentary on Deuteronomy*. New York: T and T Clark.
- Koestler, Arthur. 1976. *The thirteenth tribe: The Khazar Empire and its heritage*. New York: Random House.
- Konner, Melvin. 2003. *Unsettled: An anthropology of the Jews*. New York: Penguin.
- Kopelman, Naama M., Lewi Stone, Chaolong Wang, et al. 2009. Genomic microsatellites identify shared Jewish ancestry intermediate between Middle Eastern and European populations. *BMC Genetics* 10:80.
- Kraabel Alf T. 1979. "The Diaspora synagogue: Archaeological and epigraphic evidence since Sukenik," in *Aufstieg und Niedergang der Romischen Welt* 19(1). Edited by Hildegard Temporini and Wolfgang Hasse, pp. 477–510. Berlin: Walter de Gruyter.
- Kraeling, Carl Hermann. 1956. *The excavations at Dura-Europos: Final report*, vol. 8, pt. 1: *The synagogue*. New Haven: Yale University Press.
- Kraemer, Ross S. 1989. On the meaning of the term "Jew" in Greco-Roman inscriptions. *Harvard Theological Review* 82(1):35–53.
- Lahr, Marta M., and Rebeca Haydenblit. 1995. The human remains from the site of Et-Tin, Israel. *Pal orient* 21(1):97–111.
- Lasker, Daniel J. 1990. Proselyte Judaism, Christianity, and Islam in the thought of Judah Halevi. *Jewish Quarterly Review* 81(1/2):75–91.
- Lazard, Gilbert. 1968. La dialectologie du Jud o-Persan. *Studies in Bibliography and Booklore* 8:77–98.
- Lecker, Michael. 1995. The conversion of Himyar to Judaism and the Jewish Banu Hadl of Medina. *Die Welt des Orients* 26:129–36.
- Leonhardt-Balzer, Jutta. 2007. "Jewish worship and universal identity in Philo of Alexandria," in *Jewish identity in the Greco-Roman world*. Edited by J rg Frey and Daniel R. Schwartz, pp. 29–54. *Arbeiten zur Geschichte des Antiken Judentums und des Urchristentums* 71. Leiden: Brill.
- Levy-Lahad, Ephrat, Raphael Catane, Shlomit Eisenberg, et al. 1997. Founder BRCA1 and BRCA2 mutations in Ashkenazi Jews in Israel: Frequency and differential penetrance in ovarian cancer and in breast-ovarian cancer families. *American Journal of Human Genetics* 60(5):1059–67.
- Linder, Amnon. 1987. *The Jews in Roman imperial legislation*. Detroit: Wayne State University Press.
- Listman, Jennifer B, Deborah Hasin, Henry R Kranzler, et al. 2010. Identification of population substructure among Jews using STR markers and dependence on reference populations included. *BMC Genetics* 14:11–48.
- Livshits, Gregory, Robert R. Sokal, and Eugene Kobylansky. 1991. Genetic affinities of Jewish populations. *American Journal of Human Genetics* 49:131–46.
- Malkiel, David. 2001. Destruction or conversion: Intention and reaction, Crusaders and Jews, in 1096. *Jewish History* 15(3):257–80.

- Mason, Steve. 2007. Jews, Judaeans, Judaizing, Judaism: Problems of categorization in ancient history. *Journal for the Study of Judaism* 38:457–512.
- Matassa, Lidia. 2007. Unravelling the myth of the synagogue on Delos. *Bulletin of the Anglo-Israel Archaeological Society* 25:81–115.
- McGing, Brian. 2002. “Population and proselytism: How many Jews were there in the ancient world?” in *Jews in the Hellenistic and Roman cities*. Edited by John R. Bartlett, pp. 88–106. New York: Routledge.
- Meyendorff, John. 1966. Grecs, Turcs et Juifs en Asie Mineure au XIVe siècle. *Byzantinische Forschungen* 1:211–18.
- Muhsam, Helmut. 1964. The genetic origin of the Jews. *Genus* 20:36–63.
- Myres, Natalie, Siiri Rootsi, Alice A Lin, et al. 2011. A major Y-chromosome haplogroup R1b Holocene era founder effect in Central and Western Europe. *European Journal of Human Genetics* 19(1):95–101.
- Nasidze, Ivan, E. Y. S. Ling, Dominique Quinque, et al. 2004. Mitochondrial DNA and Y-chromosome variation in the Caucasus. *Annals of Human Genetics* 68:205–21.
- Nebel Almut, Dvora Filon, D. A. Weiss, et al. 2000. High-resolution Y chromosome haplotypes of Israeli and Palestinian Arabs reveal geographic substructure and substantial overlap with haplotypes of Jews. *Human Genetics* 107(6):630–41.
- Nebel, Almut, Dvora Filon, Bernd Brinkmann, et al. 2001. The Y-chromosome pool of Jews as part of the genetic landscape of the Middle East. *American Journal of Human Genetics* 69(5):1095–1112.
- Nebel, Almut, Dvora Filon, Marina Faerman, et al. 2005. Y-chromosome evidence for a founder effect in Ashkenazi Jews. *European Journal of Human Genetics* 13(3):388–91.
- Need, Anna C., Dalia Kasperavičiūtė, Elizabeth T. Cirulli, and David B. Goldstein. 2009. A genome-wide genetic signature of Jewish ancestry perfectly separates individuals with and without full Jewish ancestry in a large random sample of European Americans. *Genome Biology* 10(1):R7.
- Neusner, Jacob. 1963. Some aspects of the economic and political life of Babylonian Jewry, ca. 160–220 C.E. *Proceedings of the American Academy for Jewish Research* 31:165–96.
- . 1964a. The conversion of Adiabene to Judaism: A new perspective. *Journal of Biblical Literature* 83(1):60–66.
- . 1964b. The Jews in pagan Armenia. *Journal of the American Oriental Society* 84(3):230–40.
- Oeconomos, Lysimachos. 1918. *La vie religieuse dans l'empire byzantin au temps des Comnènes et des Anges*. Paris: Éditions Ernest Leroux.
- Olshen, Adam B., Bert Gold, Kirk E. Lohmueller, et al. 2008. Analysis of genetic variation in Ashkenazi Jews by high density SNP genotyping. *BMC Genetics* 9:14.
- Ostrer, Harry. 2012. *Legacy: A genetic history of the Jewish people*. Oxford: Oxford University Press.
- Ostrer, Harry, and Karl Skorecki. 2013. The population genetics of the Jewish people. *Human Genetics* 132(2):119–27.
- Patai, Raphael. 1996. *The Jews of Hungary*. Detroit: Wayne State University Press.
- Pinhasi, Ron, Mark G. Thomas, Michael Hofreiter, et al. 2012. The genetic history of Europeans. *Trends in Genetics* 28(10):496–505.

- Posth, Cosimo, Gabriel Renaud, Alissa Mittnik, et al. 2016. Pleistocene mitochondrial genomes suggest a single major dispersal of non-Africans and a late glacial population turnover in Europe. *Current Biology* 26:832–33.
- Rabinowitz, Louis. 1948. *Jewish merchant adventurers: A study of the Radhanites*. London: E. Goldston.
- Rajak, Tessa. 1996. “Jews as benefactors,” in *Studies on the Jewish Diaspora in the Hellenistic and Roman periods*. Edited by Benjamin Isaac and Aharon Oppenheimer, pp. 17–37. Ramot: Tel-Aviv University.
- Rapaport, Uriel. 1965. *Jewish religious propaganda and proselytism in the period of the second commonwealth*. PhD dissertation. Hebrew University, Jerusalem.
- Richardson, Peter. 1996. *Herod: King of the Jews and friend of the Romans*. Columbia: University of South Carolina Press.
- Risch, Neil, Hua Tang, Howard Katzenstein, and Josef Ekstein. 2003. Geographic distribution of disease mutations in the Ashkenazi Jewish population supports genetic drift over selection. *American Journal of Human Genetics* 72(4):812–22.
- Rootsi, Siiri, Doron M. Behar, Mari Järve, et al. 2013. Phylogenetic applications of whole Y-chromosome sequences and the Near Eastern origin of Ashkenazi Levites. *Nature Communications* 4:2928.
- Rosenthal, Eric, Kelsey Moyes, Christopher Arnell, et al. 2015. Incidence of BRCA1 and BRCA2 non-founder mutations in patients of Ashkenazi Jewish ancestry. *Breast Cancer Research and Treatment* 149(1):223–27.
- Rudolphi, Karl Asmund. 1812. *Beiträge zur Anthropologie und allgemeinen Naturgeschichte*. Berlin: Haude und Spener.
- Ruderman, David B. 2010. *Early modern Jewry: A new cultural history*. Princeton: Princeton University Press.
- Salamon, M., S. Tzur, B. Arensburg, et al. 2010. Ancient mtDNA sequences and radiocarbon dating of human bones from the Chalcolithic caves of Wadi el Makkukh. *Mediterranean Archaeology and Archaeometry* 10(2):1–14.
- Sand, Shlomo. 2009. *The invention of the Jewish people*. New York: Verso.
- Schwartz, Daniel R. 2007. “‘Judaean’ or ‘Jew’? How should we translate *ioudaios* in Josephus?” in *Jewish identity in the Greco-Roman world*. Edited by Jörg Frey and Daniel R. Schwartz, pp. 3–28. *Arbeiten zur Geschichte des antiken Judentums und des Urchristentums* 71. Leiden: Brill.
- Seldin, Michael F., Russell Shigeta, Pablo Villoslada, et al. 2006. European population substructure: clustering of northern and southern populations. *PLoS Genetics* 2(9):e143.
- Semino, Ornella, Chiara Magri, Giorgia Benuzzi, et al. 2004. Origin, diffusion, and differentiation of Y-chromosome haplogroups E and J: Inferences on the Neolithization of Europe and later migratory events in the Mediterranean area. *American Journal of Human Genetics* 74:1023–34.
- Sengupta, Sanghamitra, Lev A. Zhivotovsky, Roy King, et al. 2006. Polarity and temporality of high-resolution Y-chromosome distributions in India identify both indigenous and exogenous expansions and reveal minor genetic influence of Central Asian pastoralists. *American Journal of Human Genetics* 78(2):202–21.
- Sharf, Andrew. 1971. *Byzantine Jewry from Justinian to the Fourth Crusade*. London: Routledge and Kegan Paul.

- Shen, Peidong, Tal Lavi, Toomas Kivisild, et al. 2004. Reconstruction of patrilineages and matrilineages of Samaritans and other Israeli populations from Y-chromosome and mitochondrial DNA sequence variation. *Human Mutation* 24(3):248–60.
- Shlush, Liran I, Doron M. Behar, Guennady Yudkovsky, et al. 2008. The Druze: A population genetic refugium of the Near East. *PLoS ONE* 3(5):e2105.
- Simon-Shoshan, Moshe. 2007. The tasks of the translators: The Rabbis, the Septuagint, and the cultural politics of translation. *Prooftexts* 27(1):1–39.
- Skorecki, Karl, Sara Selig, Shraga Blazer, et al. 1997. Y chromosomes of Jewish priests. *Nature* 385:32.
- Stampfer, Shaul. 2014. Review: *The origin of Ashkenazi Jewry: The controversy unraveled*. *East European Jewish Affairs* 44(1):125–31.
- Stern, Menahem, ed. and trans. 1974. *Greek and Latin authors on Jews and Judaism, Vol. I: From Herodotus to Plutarch*. Jerusalem: The Israel Academy of Sciences and Humanities.
- Tian, Jiao-Yang, Hua-Wei Wang, Yu-Chun Li, et al. 2015. A genetic contribution from the Far East into Ashkenazi Jews via the ancient Silk Road. *Scientific Reports* 5:8377.
- Tcherikover, Victor. 1959. *Hellenistic civilization and the Jews*. Philadelphia: Jewish Publication Society of America.
- Thomas, Mark G., Karl Skorecki, Haim Ben-Amid, et al. 1998. Origins of Old Testament priests. *Nature* 394(6689):138–40.
- Thomas, Mark G., Michael E. Weale, Abigail L. Jones, et al. 2002. Founding mothers of Jewish communities: Geographically separated Jewish groups were independently founded by very few female ancestors. *American Journal of Human Genetics* 70(6):1411–20.
- Tobi, Yosef. 1999. *The Jews of Yemen: Studies in their history and culture*. Leiden: Brill.
- Tofanelli, Sergio, Francesca Brisighelli, Paolo Anagnostou, et al. 2015. The Greeks in the West: Genetic signatures of the Hellenic colonisation in southern Italy and Sicily. *European Journal of Human Genetics* 24:429–36.
- Trebilco, Paul R. 1991. *Jewish communities in Asia Minor*. Cambridge: Cambridge University Press.
- Underhill, Peter A., G. David Poznik, Siiri Rootsi, et al. 2015. The phylogenetic and geographic structure of Y-chromosome haplogroup R1a. *European Journal of Human Genetics* 23(1):124–31.
- van Straten, Jits. 2011. *The origin of Ashkenazi Jewry: The controversy unraveled*. New York: Walter de Gruyter.
- . 2015. Our authors respond: Shaul Stampfer, review of Jits van Straten, *The origin of Ashkenazi Jewry: The controversy unraveled*. *East European Jewish Affairs* 45(1):132–33.
- Vernadsky, George. 1933. The heresy of the Judaizers and the policies of Ivan III of Moscow. *Speculum* 8(4):436–54.
- Wacholder, Ben Zion. 1956. Halakah and the proselyting of slaves during the Gaonic era. *Historia Judaica* 18(2):89–106.
- . 1958. Attitudes towards proselytizing in the Classical Halakah. *Historia Judaica* 20: 77–96.
- Wasserstein, Abraham. 1996. “The number and provenance of Jews in Graeco-Roman antiquity: A note on population statistics,” in *Classical studies in honor of David Soblberg*. Edited by Ranon Katzoff, pp. 307–17. Ramat Gan: Bar-Ilan University Press.

- Webb, Steven G., and Phillip C. Edwards. 2002. The Natufian human skeletal remains from Wadi Hammeh 27 (Jordan). *Paléorient* 28(1):103–23.
- Weissenberg, Samuel. 1895. Die südrussischen Juden: Eine anthropometrische Studie. *Archiv für Anthropologie* 23:347–423.
- Weitzman, Steven. 2017. *The origin of the Jews: The quest for roots in a rootless age*. Princeton: Princeton University Press.
- Wiseman, Donald J. 1961. *Chronicles of Chaldaean kings (626–556 B.C.) in the British Museum*. London: Trustees of British Museum.
- Wolfson, Harry A. 1944. Philo on Jewish citizenship in Alexandria. *Journal of Biblical Literature* 63(2):165–68.
- Xue, James, Todd Lencz, Ariel Darvasi, et al. 2017. The time and place of European admixture in Ashkenazi Jewish history. *PLoS Genetics* 13(4):e1006644.
- Yardumian, Aram, and Theodore G. Schurr. 2011. Who are the Anatolian Turks? A reappraisal of the anthropological genetic evidence. *Anthropology and Archeology of Eurasia* 50(1):6–42.
- Yerushalmi, Yosef H. 1982. *Zakhor, Jewish history and Jewish memory*. Seattle: University of Washington Press.
- Yuval, Israel J. 2006. The myth of the Jewish exile from the Land of Israel. *Common Knowledge* 12(1):16–33.
- Zoosmann-Diskin, Avshalom. 2010. The origin of Eastern European Jews revealed by autosomal, sex chromosomal and mtDNA polymorphisms. *Biology Direct* 6(5):57.
- Zunz, Leopold. 1966. *Die gottesdienstlichen Vorträge der Juden historisch entwickelt. Ein Beitrag zur Altertumskunde und biblischen Kritik, zur Literatur- und Religionsgeschichte*. Hildesheim: G. Olms.