It is clear from this comparative study that the origins of jewelry-making methods are distinctly different between the two regions. Those in the Aurès derive from antique and protohistoric techniques, whereas those from the Grande Kabylie are supposed to be of Andalusian origin, brought to North Africa by Jewish and Moorish artisans expelled from Spain after the fall of the Kingdom of Granada in the 15th century.

H. Camps-Fabrer's book demonstrates how well grounded she is in her subject. Nothing is left to chance, and her information is precise and clearly presented. The bibliography is complete, and all photographs and illustrations are informative and impressive at the same time. This book truly represents the work of a professional researcher. Its contents are such that they merit the interest not only of researchers, but also of collectors and of those who enjoy quality art books. Written in French, the text finally corrects a certain amount of error and confusion previously written about the subject, especially the notion that this jewelry is of Moroccan origin. Lois Sherr Dubin, in *The History of Beads* (1987: 149, no. 146), does not hesitate to locate the "town of Kabylia" in southern Morocco, where Jewish artisans make enameled jewelry. In fact, there is not now and never has been a town called Kabylia in this or any other region of the Maghreb. Kabyle enamel work, as we have already seen, is made by Muslim and not Jewish craftsmen. Dubin is probably referring to the town of Tiznit in southeastern Morocco.

Robert K. Liu, in his short critique of Camps-Fabrer's book in *Ornament* (1992, Vol. 15, No. 4, p. 84), is ambiguous and leads one to believe that the massive enameled Kabyle jewelry is also made in the Aurès. Enameling techniques are unknown there. Liu also infers that this type of jewelry is made "in a very similar form by the Berbers of adjoining Morocco," which is inaccurate. The production of traditional enameled jewelry in Morocco is practically non-existent since the departure of Jewish silversmiths earlier in this century. Also, even though the technique of cloisonné enameling may be similar, the forms, colors (yellow and green from Tiznit) and assemblages are quite different. Red coral is not used in Moroccan enamel work, being replaced by variously colored glass.

One interesting aspect not mentioned by Camps-Fabrer concerns the current existence of an enormous production of imitation Kabyle-style enameled jewelry in Morocco. White metal is used instead of silver, making these pieces relatively inexpensive. Red coral is replaced by cheap porcelain beads. These imitations are mass produced with an emphasis on quantity rather than quality. The relatively poor craftsmanship and use of poor quality materials distinguish them from real Kabyle jewelry. This extensive production is centered in Marrakech, and is destined for the tourist trade. The Moroccan imitations are often sold erroneously as real Kabyle jewelry to an unsuspecting foreign clientele.

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The Glassmakers: An Odyssey of the Jews, The First Three Thousand Years.

Samuel Kurinsky. Hippocrene Press, New York, 1991. xxiii + 434 pp., 102 figs., bibliography, index. $29.50 (cloth).

Glass has long been the most important material for making beads. This book, while discussing beads only casually, has a wealth of information on the early history of glass, which is essential to an understanding of the history of glass beads.

The book can be read on at least two levels. For those not familiar with research into glass history, it is an instructive introduction to this subject. For those already acquainted with the basics of glass history, the focus of interest will be the case that Kurinsky makes concerning the nature of glassmakers in the formative period.

Kurinsky alerts his readers from the outset to his major tenets. He begins by saying that glassmaking is an extremely complex operation and as such was invented only once, unlike many other human innovations (p. xiii). For glassmaking and the production of glass objects to spread, therefore, he postulates that the inventors of this admirable material kept the secrets of their art to themselves and passed it down only to their descendants. The people

he identifies as having done this are the Jews, and he makes no apology for this book being a frank protagonist of that position (p. xiv).

His Introduction sets up the cultural climate of Judaism. He rightly asserts that there is considerable intellectual freedom within the religion, widespread literacy among its practitioners, and no doctrinal fear of or repulsion from hard work or artistic achievement. God is seen as the principal artificer, and, as the stewards of God, humans also create from the raw materials at hand.

In Chapter 1 Kurinsky argues that the origin of glass is to be found in Mesopotamia (modern Iraq). To do this, he expends considerable energy disputing the now-discredited theory that glass was an Egyptian invention. Although no glass historian today defends this hypothesis, it is still with us in much of the popular literature. Moreover, the persistence of academic certitude which the debate reveals is instructive.

Chapter 2 discusses the complex steps needed to make glass and the relationship between glass and glaze. Readers not familiar with this technology may be surprised to learn that several steps are usually required to form glass. The raw ingredients do not immediately produce it upon heating, but only make frit which must be broken up and reheated with some preexisting glass in order to make new glass.

The next three chapters are concerned with glassmaking in Egypt and Canaan/Israel. The Hyksos of Canaan are identified as the carriers of glassmaking to Egypt. The valid point is made that glassmaking requires considerable fuel in the form of wood, and Egypt had rather little wood. Canaan/Israel is seen as an exporter of raw glass, Kurinsky citing the cargo of a ship sunk during the 13th-14th century B.C. The emergence of the Israeli state is traced, with ample indication that the Israelites had iron technology. This is relevant because glassmakers and iron smelters have similar needs in the form of the furnaces used.

Chapter 6 is largely based on historical documentation, with a discussion of the Jews' role within the Roman Empire. The Romans and Greeks did not take well to heavy work, leaving that in the hands of slaves, including Jews. An edict of Diocletian mentioned the glass of Judea and of Alexandria. Kurinsky contends that glassmaking in both centers was in the hands of Jews.

Chapter 7 is one of the more interesting parts of the book. Kurinsky relates his experiences during a tour of Israel, particularly visiting the inland mountainous region. There he surveyed many sites which have evidence of glassmaking in the form of frit and other imperfect glass, as well as evidence of glassworking. The author makes the valuable distinction between the making of glass and the making of objects from glass, though the standard term "glassworking" is better than his "glassware-making," as the latter only refers to certain end products.

The sites he discusses are impressive, and they demand more scientific archaeological work. His thesis is that glass was produced inland in the forested mountains by Jews and exported (and perhaps worked) by the coastal dwellers, the Canaanites. Kurinsky prefers the term Canaanite to Phoenician, with which we are perhaps more familiar as the name of the people long considered the great ancient glassmakers.

The remaining chapters are devoted to the spread of glassmaking elsewhere. Chapter 8 covers Asia, particularly China and India. The vector that Kurinsky identifies for spreading glassmaking is again the Jews, this time following mercantile routes. Chapter 9 covers the introduction of glassmaking to Persia by the same means, and presents further remarks on India.

Chapter 10 sees the spread of glassmaking into the Caucasus, Russia and Eastern Europe. This is identified with the conversion of the court of the Khazars to Judaism. The Khazars, a fairly peaceful people who flourished on trade, migrated from Central Asia to settle the region between the Black and Caspian seas. They were socially tolerant, and considered important allies by Byzantium.

The final chapter is concerned with glassmaking in Byzantium, the eastern remnant of the Roman Empire. Following the fall of its capital, Constantinople, Jewish glassmakers are traced into Europe and, of special interest to us, into Venice.

Kurinsky has amassed a great deal of data to demonstrate his contention that glassmaking was a Semitic invention and virtually always in the hands of the group that gave rise to the nation of Israel. His purview is truly global, covering nearly the whole world. He draws upon several lines of evidence:

history, archaeology, glass technology and linguistics.

But, is his central thesis correct? Since it is virtually impossible to attach ethnic origins to archaeological materials, and since historical materials are scanty — suppressed or otherwise — we must look at the arguments that Kurinsky puts forward.

He begins by asserting that glass was invented only once in Mesopotamia. This may or may not have been so. There is at least as good a case to be made for glass having been invented and developed by the non-Semitic Hurrians to the north in the Caucasus region. Kurinsky mentions them in conjunction with the advanced furnaces they built, but regards the invention as taking place to the south. However, others disagree. Engle (1973) has long been a proponent of the Hurrian origin of glass, though she equates later developments with the Jews. Recent excavations in the old Hurrian homeland (McGovern, Fleming and Swann 1991) have strengthened this idea. The importance of glass at the ancient city of Nuzi, which Kurinsky (pp. 18-23, etc.) stresses, also lends weight, for Nuzi was a Mitanni; i.e., a Hurrian city, not a Semitic one.

The idea that glass was invented only once is a statement of belief, not of fact. Independent glass production, using local raw materials and producing glass which differs from other types, apparently happened several times. Glass was made in Europe, perhaps first in the region of Switzerland or northern Italy, as early as the 13th century B.C. (Henderson 1988a, b). This glass differs from that of the Middle East, and though its production may have been inspired by imported beads, nothing suggests Jewish glassmakers in that area at the time. Glass production is also much older in Asia than Kurinsky indicates. The earliest glass in China, of the distinctive lead-barium type, dates to the 11th century B.C. (Yang 1985: 16). In India, the origins of glass are now dated to at least as early as 1000 B.C. (Francis 1984).

While glassmaking is not especially easy, it is not quite as difficult as Kurinsky would have us believe. Experiments have shown that glass could be made in furnaces similar to Roman pottery kilns, even without forced drafts (Brill 1963: 127-8). The raw materials of glass will melt over a wide range of temperatures, depending upon the precise mixture used (Morey 1936). The mastering of pottery making, glazing and/or metallurgy could have lead to glassmaking.

One other important element in the process of the invention of glass is overlooked by Kurinsky: faience production. Faience is similar to glass, with the same ingredients of silica (sand) and an alkali and coloring matter. It is unlike glass in that the sand particles do not completely melt with the help of the alkali, but only at their surfaces, where they touch (this is called sintering). The alkali on the surface of a faience bead or other object does melt the silica and a glaze or thin layer of true glass is formed. Faience production was widespread in the ancient world, and has been documented at places like Scotland and Hungary, Crete and India, as well as Egypt and Mesopotamia. Faience production very likely lead to glassmaking in some cases; Henderson (1988a: 436-8) suggests that happened in Bronze Age Europe. I believe that such a development took place in northern India as well.

Even so, what of Kurinsky's evidence for the spread of glassmaking through Europe and the Middle East? Could he be correct about the Jewish role in these cases? In some, he certainly is. In others, perhaps not. Much of his documentation is circumstantial. He can point to scraps of evidence, but they do not necessarily add up to the conclusions he draws. Just by showing that some glassmakers were Jews or that there were Jews living in a place where glass was made is not enough to establish conclusively that all glassmakers were Jews.

In some particulars, his assertions do not bear scrutiny. Glassmaking in China and India has already been mentioned; the evidence that Kurinsky cites is outdated. The claim of the newly converted Jewish Khazars bringing glassmaking to the Caucasus, Russia and Eastern Europe is undermined by the existence of glassmaking houses in these areas prior to the conversion of the Khazars around A.D. 740. Glassmaking existed in Armenia, Georgia and the Ukraine before this time (Bezborodov and Zadneprovsky 1965: 128, 133).

One may also take exception to some other lines of Kurinsky's arguments. On several occasions he asserts that because a given language has no special word for glass, the people who spoke the language did not make glass. This is spurious. For one thing, the histories of some of the languages he cites are not well known. For another, we do not always know what

words may have been used for glass. The Chinese, for example, were making glass for a thousand years before the first record of their name for glass appears. Moreover, a special word is not necessary. There are languages spoken by many people with no special word for "bead" ("pearl" being the most common substitution), but there are beadmakers among them, some producing beads for centuries (the Italians, for example) and some for millennia (such as Indians).

There are also minor points which are not fatal, but throw doubt on various arguments. Glaze and glazed pots are said to date to 6000 and 4000 B.C. in Mesopotamia (pp. 42-3), some 1500 years too early. Claiming that socketed tool heads (those with a hole to insert the handle) were "virtually unknown outside of Canaan and Mesopotamia" in the 14th century B.C. (p. 86) ignores the earliest such tool recorded, from Non Nok Tha in Thailand which dates to before 3000 B.C. (Solheim 1972: 8). I also find the high estimate of 8,000,000 Jews in the Roman Empire hard to believe (p. 150), nor is a reference cited. In 1800, they were estimated at only about 2.5 million in the whole world (Loewe 1942: 62).

Finally, though this is a handsome volume, it lacks many editorial and scholarly refinements. Illustrations are not numbered, nor is a list of them provided. The index is long but don't bother looking for "bead," though they are mentioned all through the book; there is not even a cross reference to "eye bead." The index would have been made much more useful by having subentries to major entries that have many page references.

In some cases, material is discussed but not referenced. For example, the documents of the Cairo Geniza are noted twice and conclusions drawn from them (pp. 272, 279), but no footnotes are used in the text. The pioneering work of S.D. Goitein on this material, consisting of numerous articles and several volumes, is never mentioned, even in the bibliography. Though these documents, many of which deal with glassmaking and trade, concern a period somewhat later than the scope of the book, their use to bolster arguments calls for citations.

The worst offender is the slipshod bibliography. The translations or editions of classical works are not cited. Some titles have languages inappropriately mixed. Journal articles are never furnished with page numbers. Often no publishers are listed, sometimes no dates, sometimes both are omitted, and in a few cases even titles are absent. Whole journals, encyclopedias or collected works are cited without any further indication of more precise sources.

Given these misgivings and correctives, does this mean the book under review has no worth? Not at all. It is, in fact, a valuable and important addition to our understanding of the history of glass and glass beads. Bead research does not stop with the beads. A bead can be admired on the aesthetic level, it can be superficially valued for its presumed age or intrinsic price, but bead research goes beyond these concerns.

Bead research is humanistic. It seeks to understand the motives, lives and actions of the people who made, moved and used beads. This is precisely what this book is all about. It attempts to uncover the social history of the most important bead material, though it is admittedly prejudiced in favor of a particular point of view.

Certainly, the children of Israel have been glassmakers for a long time in many places. Even if it can never be proved that they invented glass, and even if it is demonstrated that not all glassmaking traditions can be traced to them, their contribution has been tremendous. This was clear even before Kurinsky's book from the work of various scholars and documents well known to specialists, such as those of the Cairo Geniza. But to Kurinsky goes the prize for stating the case most forcefully and eloquently.

Hence, even if the book is not correct in all details, there is much to be gained from it. It should serve as a treasure house of information for a long time to come. More importantly, it is provocative. It will confirm its worth if it inspires further investigation into the questions it asks. Even though it may not be provable that all glassmakers descended from Mesopotamian Semites who eventually became part of the House of David, it certainly serves as a reminder that Jews have played a central role in the development of this wondrous material.

A second work has already been promised and will explore the development of glass from more recent centuries. It is eagerly awaited.

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Scientific Research in Early Chinese Glass.

Robert H. Brill and John H. Martin, editors. The Corning Museum of Glass, One Museum Way, Corning, New York 14830-2253; 1991. ix + 212 pp., 187 figs., 32 tables. $55.00 (cloth).

This attractive and well-constructed book fills a niche in glass studies that has been empty since before Liberation. Brill and Martin and The Corning Museum are to be congratulated for obtaining funds from the Woodcock Foundation and the National Science Foundation for the publication of this "Symposium sponsored by TC17: The Archaeometry of Glass, a Technical Committee of the International Commission on Glass." Officially this work represents and is subtitled the "Proceedings of The Archaeometry of Glass Sessions of the 1984 International Symposium on Glass, September 7, 1984 with Supplementary Papers." It is also A Publication of The Corning Museum of Glass.

The original symposium had seven papers listed, two of which were not delivered, yet eleven papers were presented. The two papers not read are included in Part I. Part II contains seven Supplementary Papers.

In their Introduction, the editors present an impressive list of sixteen research questions, a list worthy of further discussion and research. As they point out, the symposium has resulted in the emergence of some answers but also new questions. When this research is applied to modern bead research, even more questions come to mind. They also explain that the delay in publication is the result of the success of the meeting. Too many papers resulted in the need for a new source of publication funds.

In the Introduction to the Symposium Papers, Gan Fuxi sets the tone of the symposium in his major interest, the chemistry of Chinese glass. He also presents a brief but well-done summary of the major arguments on the origins of Chinese glass.

Gan sets up four major dated periods for the production of Chinese glass:

1. From the Western Zhou Dynasty (ca. 1100-771 B.C.) to the Spring and Autumn Period (770-476 B.C.).
2. From the Warring States Period (475-227 B.C.) to the Sui Dynasty (A.D. 581-618).
3. From the Tang Dynasty (A.D. 618-907) to the Yuan Dynasty (A.D. 1271-1368).
4. From the Ming Dynasty (A.D. 1368-1644) to the Qing Dynasty (A.D. 1644-1911) [p. 2].