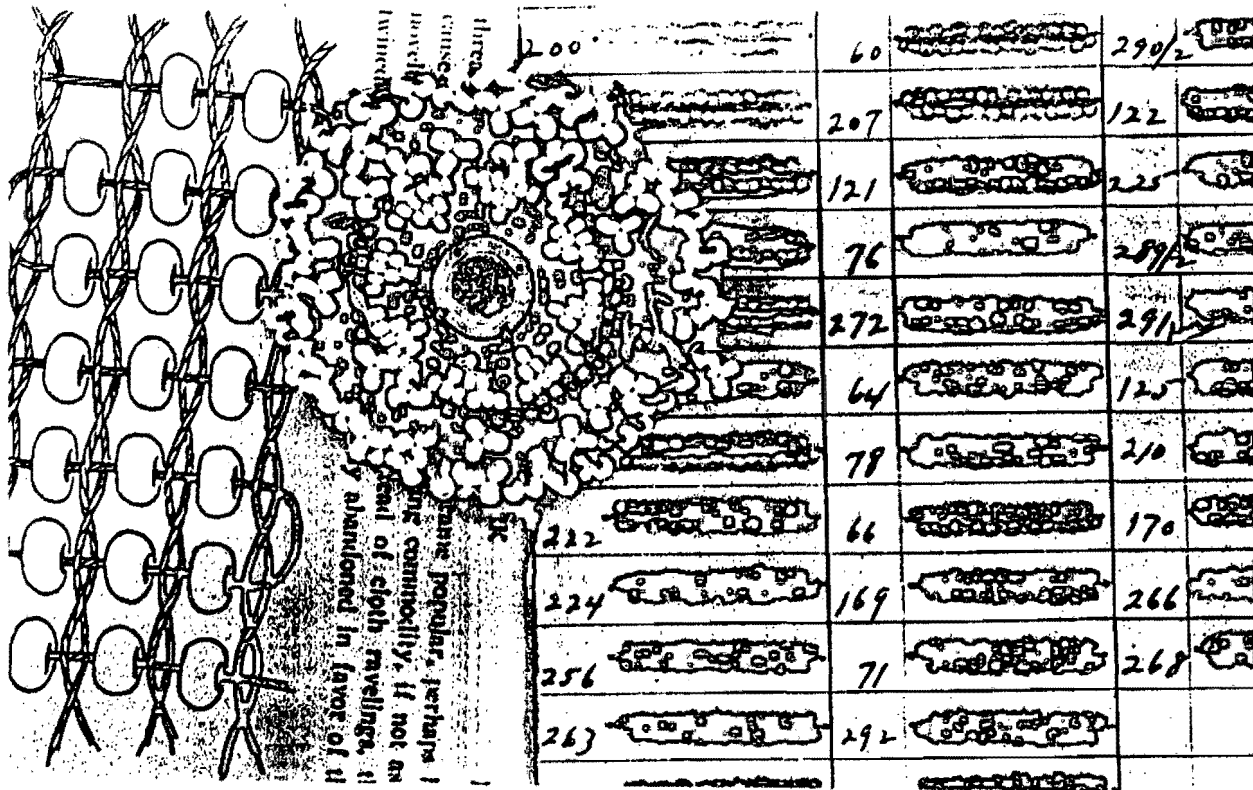


# The MARGARETOLOGIST

## Special Issue: Seed Beads



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### Through the Eye of a Needle

I am writing this at a cusp. It is 1 October and I have just finished trips to Toronto, Denver and Chicago. I have also finished (at least the texts) my chapter on beads at Arikamedu (250 pp.) and *The Asian Maritime Bead Trade* (600 pp.). In a few days, I leave for Africa, hoping to keep in touch almost anywhere with my laptop.

It is the end of an era. Since my first visit to Arikamedu 16 years ago, I have been working toward a definitive archaeological report. From Arikamedu my horizon widened to include the whole Asian littoral, and completing the *AMBT* winds up this phase.

Yet, the story goes on. Look at the (at least to me) exciting news on page 14 about East Javanese beads in Palau. By happenstance, I saw Tjissen-Etison's book in time to include the data in the *AMBT* chapter on East Java and the Heirloom Appendix.

Today marks another milestone: the publishing of data I have been gathering for several years on seed beads. This issue can serve as a monograph on these beads. The *Seed Bead Gallery* is on [thebeadsite.com](http://thebeadsite.com).

This project is not over. "Seed Beads and Beadwork" is the *Bead Expo '98* theme. My seed bead lecture is popular. There are more collections to consult and other questions to pursue.

[thebeadsite.com](http://thebeadsite.com) has become increasingly crucial to the Center's operation. It is now our principal means of communication and a major service. As far as I can tell, we are the largest and most visited bead site on the Internet. It has put me in touch with many people, including several old (and long-lost) friends. Its reach is truly global.

Even if you don't have a computer, you should make a habit of visiting the site *at least every time you get a new Margaretologist*. Things are constantly added (see *What's New on the Home Page*); it just

keeps on growing. The chat lines have become quite lively. The site acts as a news service. Many people come to appreciate beads for the first time or anew through it.

To access the color plates for this issue go to [thebeadsite.com](http://thebeadsite.com). At the top left click **Center for Bead Research** and from there **Color Plates**. Those of interest in this issue are: *The Seed Bead Gallery*, *Margaretologist 10:2: Palau Heirloom Beads*. The three previous issues are also illustrated there. Also, visit the **Museum and the Book**.

### CALENDAR

- ⇒ October 6: American Museum of Natural History, NYC, St. Catherine's' GA. C
  - ⇒ October 8-December 29 '97 - Ghana R
  - ⇒ December 29-February 28 '98 - Berenike, Egypt excavations C R
  - ⇒ March '98 - Bead Expo, Santa Fe D L W
- C = Consulting, D = Directing, L = Lecture, R = Research, W = Workshops

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The Margret Carey "Gotcha" Award has been extended to The Bead Site.

Her corrections for 10:1 will appear in the next issue.

About the Wampum Belt in the Denver Museum of Natural History -- It is 3 1/4 by .54 inches or about 9 cm by 1.36 meters.

Weld was the man who traveled through North America in 1795-7. Thomas Beasley apparently owned the volume photocopied for me at the Canadian National Library. Beasley was a collector, but whether this belt did ever belong to him is still not verified. Its history remains clouded.

## Seed Beads: A Personal Introduction

Very small beads have been around for a long time. They can be strung and worn as necklaces, bracelets or other forms of jewelry. But they can also be added to cloth, leather and any number of surfaces. This is called beadwork.

Beadwork takes on many forms, depending upon the context in which it is used. Some people consider it a mark of their ethnic identity and apply it to aesthetic, ritual, ceremonial or social ends.

In recent times, beadwork has been used by the fashion industry to add elegant accents to dresses and accessories. In the last century or so, there has been a search for the most cost-effective way to have the work done, and the centers of commercial beadwork have moved from Western Europe and North America to Asia, Latin America and Eastern Europe.

In recent decades, the role of beadwork has been enlarged, especially in the U.S. and Europe. It has become a popular medium for people to express themselves and create beautiful items for their own pleasure. It has also become an instrument of choice for many artists, who appreciate its power to enhance objects with light, color, depth, movement and life.

When I began to contemplate seriously about embarking on an intensive study of beads more than 20 years ago, I made the conscious decision that I would not deal with beadwork to any great extent.

This was not because I did not like beadwork. Indeed, I found it quite attractive. It just seemed to me that there were already a number of studies on the subject and other people interested in it. I had enough to do with other beads. I did collect pieces when I visited places it was made, but did not specialize in it.

I am neither a tailor nor a weaver, but beads are beads. In some early Bead Reports for *Ornament* and a series of articles that stretched over three years for the *Bead Society Newsletter* (Los Angeles; reprinted as Francis 1985) I wrote about the history and some of the uses of seed beads and beadwork. (I was then promoting an alternative term, "beadwork bead," which I have since abandoned – see why in the Vocabulary section).

In the last few years, my interest in these beads has grown. Indo-Pacific beads, whose story I have been tracing for 19 years, were clearly used for beadwork. The European seed bead story became more interesting to me, as I traced it both in Europe and in beadwork collections in museums.

Interest in beadwork is expanding rapidly. I chose "Seed Beads and Beadwork" as the theme for Bead Expo '98 in recognition of that. Since then, the activity on [thebeadsite.com](http://thebeadsite.com) has confirmed this (don't forget to visit). The Beadworker's Chat Line is the liveliest of the four lines. The recent Seed Bead Gallery, sponsored by Recursos de Santa Fe, is very popular.

I have learned a lot about seed beads in the last few years. I still leave beadwork and its techniques to the experts, but I know many people are interested in the background to this marvelous craft. I have thought of putting out a book on the subject, and I still may. However, for the moment this issue will be devoted to those smallest of beads.

It is dedicated to all bead lovers, all admirers of beadwork and, above all, to those who give of themselves to produce this extraordinary craft.

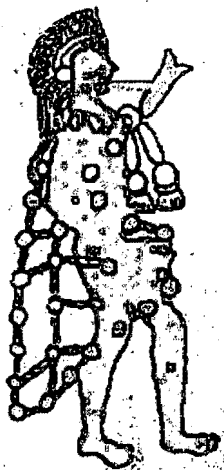
## A Short History of Beadwork

The roots of beadwork are very deep. If we define it in the broadest sense of adding beads to the surface of clothing or other objects or incorporating beads into a weave, then it can be traced back tens of thousands of years.

Ivory "basket beads," more precisely pendants, were made in France over 30,000 years ago. They seem not to have served as elements for necklaces, but are believed to have been sewn onto hides used as clothing. [White 1987].

Other uses of beads of about the same age have been detected archaeologically elsewhere in Europe. At Cavillon on the French Riviera, 200 Nassa shells and 22 pierced stag teeth were found with a burial around a man's head, suggesting they were originally part of a hair net. [Hiler 1929:28]. In the Grotte des Enfants in the Grimaldi complex of Italy, the two children for whom the cave was named were surrounded by some thousand perforated Nassa shells that formed a belt, or rather an apron, reaching from the navel to the upper thigh [ibid.:30].

This sort of primitive beadwork was not limited to the Old World. A drawing of a young Mexican man wearing a beaded net demonstrates that.



Aztec youth with beaded net cloak and shell bead necklace. Codex Rios 59r.

If, on the other hand, we define beadwork as covering an area with small beads, akin to what we think of it today, this, too is a very ancient craft.

Beadwork of this type requires many small beads of about the same size. They can be made of natural materials made uniform by the heishi method, but it is easier to use synthetic materials.

The first beadwork of this type was done in Egypt, with tiny faience beads. The earliest I know is a pair of bracelets in the Cairo Museum from the XII Dynasty, ca. 2000 BC. Not only was the beading laborious, but making the beads was very time-consuming. It is little wonder that they were worn mostly by royalty. Tutankhamun had several pieces of beadwork in his tomb, including a pair of children's slippers he must have worn while young and a cassock showing captive nations. [Fox 1951: pl. 61]

Such beadwork is rare because the material (usually cloth) onto which beads are sewn and the threads (sewn or woven) do not survive burial in most cases. The constant temperature and dry atmosphere of Egyptian tombs are perfect for such preservation, but are rare elsewhere.

There are a few early examples of beads worked into patterns on clothing and other items. A young girl buried at Haftavan Tepe, Iran, in the 9<sup>th</sup> century BC had green, yellow and brown glass beads and beads of shell and carnelian attached to her cap [Burney 1972]. At Pazyryk, Siberia, frozen graves dated to 480 B.C. contained beadwork on clothing, a purse and a mirror case. Small beads, along with red wool yarn and sinew, were sewn on the soles of shoes worn by the dead [Rudenko 1970:95, 110]. Again, the environment protected the beadwork.

There are ninth century BC literary references in India of beads being braided

into hair and the tails of horses. From about 300 BC the *Vinaya Pitaka*, the book of rules for Buddhist monks admonished:

Shoes (ornamented with) gold, silver, pearls, beryl, or crystal or copper, or glass or tin, or bronze are not to be worn, whosoever does so is guilty of a *Dukkata* offence. [Dikshit 1969:168].

The oldest surviving pieces of Asian beadwork are in the Shōsō-in, a temple dedicated to the memory of King Shomu in Nara, Japan. Items have been added since it was built in AD 752, but most of the contents are from the 8<sup>th</sup> century. Beaded brooms, clothing, a serving plate and a flower basket are among its treasures. In succeeding centuries, beads decorated sword hilts and horse accessories [Blair 1971:102-145.]

The first reference to bead weaving is in a poem by Nam Dev, ca. 1300 AD. It has been incorporated into the *Grantha Sahib* (2352), the holy book of the Sikhs:

*Just as there is one thread  
And on it are woven breadthwise and  
lengthwise*

*Hundreds of thousands of beads  
So is everything woven into the Lord.*

**E**ffective beadwork needs small, uniform beads of different colors. Aside from Egyptian faience, these first appear in India in the last centuries BC -- drawn Indo-Pacific glass beads. Their production has been continuous since, made in India, Sri Lanka, Vietnam, Thailand, Malaysia and Indonesia. As the Southeast Asian branch of this industry collapsed, the region imported equally small, wound beads from China, known as coil beads.

Both Indo-Pacific and coil beads were likely used for beadwork. Unfortunately, there is no evidence for that, save for the treasures of the Shōsō-in and a few other examples in Japan. Valerie Hector is tracing the origin of beadwork in Southeast Asia and has uncovered interesting

examples. These are not precisely dated, but the beads and the cloth on which they are sewn suggest ages of several centuries (she will present these at Bead Expo '98). Asian beadwork is likely quite old.

The earliest African beadwork, including a beaded crown, is in the tomb called Igbo Richard in Nigeria, dated to the 8<sup>th</sup> to 11<sup>th</sup> centuries [Shaw 1970:235].

In Europe, beadwork was popular in the 1500s or earlier. Pearls were sewn on caps and ecclesiastical objects. The first English reference to them is from The Inventory of Church Goods in York, etc. of 1553 "Garnished with...an edge of small seede pearle sett round aboute the same." [OED 14:874]



Lady Francis Sidney, English School, second half of 16<sup>th</sup> century. Pearls adorn her hair and the edges of her collar.

Small glass beads, mass-produced by an early industrial method in Venice from around 1480, soon became a popular adjunct to pearls in Elizabethan times.

Europeans took the beads around the world and often introduced beadwork. It did not always take quickly. Peoples of the American Plains and the Cameroon Highlands, now widely associated with beadwork, did not adopt the craft until the 1840s or so. An early mention of beadwork in the eastern U.S. and Canada was by Weld in the late 1790s. Quillwork was still in vogue, but beads were already being applied to moccasins and leggings [Weld 1968:232-3].

## Questions, Questions

Over the years, I have been asked about seed beads: how to judge their age or what a term or measurement meant. I had to be honest and reply that I did not know. Not knowing something has always been a challenge to me to discover the answer. The three most common questions have been how seed bead are sized, the size of a hank or bunch and the age of beads. As I researched these problems it has become evident why they were problems – there are no simple answers to any of them.

### The Sizing of Seed Beads

One of the most confusing aspects of seed beads is the system used to designate their sizes. I am often asked how sizes are calculated. People try to devise formulas to work out how many beads of a particular size will fit in a given length or make up a specific amount by weight.

If the truth be told, it can't be done. That is because the sizes of seed beads are neither consistent nor are they geared to either the Imperial (inches, feet) or metric systems of measurements. Rather, they are gauged, in the same way wire is measured, beginning with a standard and working down a certain amount through smaller sizes.

The measurement used for seed bead sizes though the 1930s was the archaic "line," only employed today by some English printers (in the US, the "pica" is the standard, six to the inch, one pica being equivalent to 12 point type, used in this journal).

A line was a twelfth of an inch, in turn a twelfth of a foot. Before the adoption of the metric system, each foot was different. The English (and Russian) foot were the smallest, followed by the Rhineland foot and then the French (see chart).

	Foot in cm.	Line in mm.
English	30.480	2.116
Rhineland	37.664	2.179
French	38.981	2.256

So, first one had to choose the line to use for gauging seed beads. The French was generally, but not universally, the most popular. In later years, the metric system replaced the "line."

Then, a standard was chosen. In the past, it was usually two lines (ca. 4.5 mm). In more recent times, it is 6.5 to 7 mm. This standard is called the "null" bead, and is designated "0." Then, a decision has to be made as to the graduation of smaller beads. If  $\frac{1}{4}$  of a line were used, a bead that was  $1\frac{3}{4}$  lines would be the next smallest bead and designated 00 and one  $1\frac{1}{2}$  lines wide would be 000.

This was not very efficient because only seven sizes smaller than the null bead could be numbered. For this reason, metric measurements became more popular and the *difference between* each size was altered, the difference being smaller as the beads themselves got smaller.

It was also clumsy to designate a bead size as 0000000000, so this is transformed to 10/0. The null bead is sometimes marked as 1/0.

As I discussed in my report on the Czech industry [9(2) 1996], the process of making beads the same size is very complex, and in the end only partially successful. To this day, gauges are used to measure beads, and their owners jealously guard them. They are only as good as the machinists who tooled them.

To see how these different systems worked in practice, I measured beads on sample cards from different sources. They are: R.W. Grube, the principal distributors of German (Kaufbeuren) seed beads (1980s); Ets. Salvadori, the major

French seed beadmakers; (1980s); Toho (1970s) and Miyuki (1990s), the principal Japanese beadmakers; and two cards from the Czech Republic, a Jablonex card from the 1950s and a Zasada Glass Beads (distributed by Jablonex) from the 1990s. Not all sizes were available on each sample card, so I chose representative ones.

Sizes of Seed Beads in millimeters

	0 (1/0)	5/0	8/0	11/0
Grübe	7.0	4.0	3.0	2.2
Salvadori	3.0*			
Toho			2.8	2.1
Miyuki			3.0	2.2
Jablonex '50s		4.6	3.1	2.4
Jablonex '90s		4.3	3.1	2.1

\* As listed on card, actually ca. 2.8 mm.

Obviously, there are two different systems, the one used in France and the German-Czech system, adopted by the Japanese. There are variations, and even a few tenths of a millimeter could be important to some beadworkers. Czech beads seem to get smaller over time. Miyuki beads are a little larger than Toho ones. Interestingly, the smaller the beads become, the closer they are in size across industries.

Moreover, different size systems were used for different beads. In the 1950s the Czechs reported (this differs from the actual measurement) that rocailles and charlottes (see the next section for an explanation of these names) of size 11/0 were 2.1 mm in diameter, but that bugles, two-cuts and three-cuts were 1.8 cm in diameter. Size 2/0 were 6.0 mm and 3.3 mm and size 20/0 1.0 mm and 0.8 mm respectively. The null bead was much different in size and the steps between sizes differed.

What does not show up in this table is that even on a *single card* there were differences in the diameters of the beads mounted to show sizes. I had to average

the sizes of beads in the same row to arrive at a single figure.

Good Luck!

### What's a Bunch of Beads?

Beads come packaged in many ways. They can be sold loose. They are put into plastic bags and vials, and in the past into glass vials with cork tops. The most common way to package them, however, at least historically, has been in a bunch or hank, a certain amount of beads on a certain number of strings or threads. In turn, bunches are gathered together to form a bundle, a *mazza* (Italian) or a "big bunch" (Czech).

What is considered the common Venetian practice was to join ten strings to make a bunch and twelve bunches to make a *mazza* [Neuwirth 1994:104]. This is the bunch given by Dominique Busolin, writing of the Venetian industry in 1847, "*margaritines* for embroidery are strung in *masses* of one hundred twenty strings, 5 *pouces*... long." [Karklins and Adams 1990:73] (A *pouce* is a French inch, a little longer than the English – 5 *pouces* is a little more than 13.5 cm – the translators left out a digit.)

There is no information on how long this was standard in Venice. The most detailed explanations of bunches of beads I know are on Czech sample cards of the 1950s. These seem to have been standard for a long time. When I asked people in Jablonex about bundles and bunches, they sent me photocopies of charts from newer cards that duplicated the bunches on the sample cards in the Center's collection.

To say that there was a great variety in these bunches is an understatement. Rocaillies and charlottes were offered in no less than twelve different ways, bugles in five, and two- and three-cuts in another five. Rocaillies and charlottes were offered in bunches as small as 5 cm (2")



long strung ten to a bunch or as large as 50 cm (19.7") strings twelve to the bunch.

Moreover, beads were actually sold by weight, either pounds or kilograms. In turn, the weight of the beads was determined by the ingredients in the glass. Beads with heavy metal contents for special colors are heavier than those without.

Most of the names for the bunches are geographical. There are: PARI[s], AMERI[ca], KILI (either Kilimanjaro, Tanzania or Kilindini, Kenya), VICTORIA (Lake), NYASSA (modern Malawi), NIGER (probably Nigeria), CAPE (of Good Hope), INDIA, CANADA, MISRI (Arabic for Egypt) and OTOMAN (Turkey). The ones I have not satisfactorily identified are HRMA, KLAPAT, INROC and NEPAR.

#### Dating Seed Beads

One way to date seed beads is to know when a particular color or style was first introduced. Thus, gold ruby glass for white hearts and pink glass was not used for seed beads until about 1830. Charlottes are known by 1840. The 1850s saw the introduction of lustering and silver-inside beads. During the 1860s, color lined beads and two-cuts were successful, with galvanized and probably three-cut beads in the next decade. White beads lost their clear coat in the late 1860s and Imperial yellow was produced around this time. Square holes became available in the 1890s. Cut steel beads disappear around 1900.

However, judging a piece of beadwork that does not have any of these distinctive types becomes much more difficult. If a worker used only, say, black, blue and white beads how could one date a piece?

I have developed a shorthand way to do this. It is a method I have found useful, but it is not foolproof. I have examined many well-dated pieces of beadwork

in the Denver Museum of Natural History and the Denver Art Museum. I intend to test these results against other beadwork collections, especially African ones. Here are my preliminary findings.

1. Before the 1860s, there was little uniformity in glass colors. The 1860s saw heated competition between Venice and Bohemia, and the Venetians introduced better glassmaking techniques and new colors.

2. After the 1920s the diameters of seed beads become more regular. As the measurements of the cards in this issue show, they are still not perfectly regular, but they were much more irregular before this time. I believe the Danner Drawing Machine was introduced to Venice and Bohemia, legally or not, almost as soon as it was put into use by the Libby Glass Co. (patented in 1917).

3. Lengths do not become relatively regular until the 1940s. I still do not know what innovation caused this.

In sum, there was a drive by European beadmakers toward making their product as standardized as possible. The ultimate standard beads are the Delica beads made by Miyuki of Japan, where computers run the beadmaking machines. This drive toward uniformity was first accomplished for colors in the 1860s, for diameters in the 1920s and for lengths in the 1940s.

I would appreciate any input others might have on this question. I shall also let you know as I continue to work on this issue.

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## A Vocabulary of Seed Beads

Seed beads receive different names. There are different languages involved, different beadmakers and distributors, and the constant input of beadworkers. Some names are used for specific beads, while others refer to techniques used to make or decorate them.

Names are important. They help us discuss things by identifying what we are communicating. This not an attempt to standardize seed beads names, but there are commonly adhered-to definitions used by beadmakers for certain beads or processes. By examining these and their history as words (etymology) our appreciation of these little beads increases.

I thought for some time about how to present these words. They could be listed alphabetically. It would be easier to find variant terms that way. However, it is more logical to begin with some of the basic terms and build upon them.

**Seed Bead.** Several writers have suggested that the term came into use as glass beads replaced beads made from actual seeds. I believe this etymology is false. If someone on the Great Plains, the Cameroon grasslands or in Gujarat, India applied such a word to a glass bead it would certainly have been in the local language, not that of an English-speaking trader.

Rather, I believe the answer is in the long and honored use of "seed pearl," which is a seed in a sense. The *Oxford English Dictionary* (hereafter OED; all editions) cites "seed pearl" as early as 1553 and then again in 1574/5, 1624 and used by John Smith in Virginia in 1710.

It does not cite "seed bead," but does cite "seed coral" in 1879, "The Chinese... used to prepare strings of small rows of seed-coral beads for embroidery." Indeed, they did. The term was labeled "simulative" by the OED after "seed pearl."

However, "seed bead" has a much richer history than "seed coral." I have three uses of this term dating to 1803, two of them ads in *The Daily Advertiser* in New York taken out by Ephraim Hart. [Gottesman 1965:108, 347] and one from a list of goods for the Lewis and Clark expedition by Israel Whelen of Philadelphia [Davis 1972:288]. My next reference comes from the 1805-6 trip of Joseph Corry [1969:58], enumerating the goods to carry to West Africa.

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**"Seed Bead" should be in the dictionary – It's been around nearly 200 years.**

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Thus, "seed bead" was an established term at least in two American cities and among the English trading in West Africa by the first decade of the nineteenth century. It is only used in English as far as I know, though the French use *grain* (seed) for small beads and in 1799 Schreyer wrote of *Körner oder Korallen* (seeds or corals) in German [Neuwirth 1994:177].

**Rocaille.** This is a French term, first used in the plural (*rocquailles*) in 1360 and in the singular in 1648. It refers to a mass of small stones or shells, such as fossils. It was later extended to imitation surfaces decorated with stones (as on the inside of a grotto used in the Stations of the Cross). During the Regency period and under Louis XV it described elaborate decorations on many surfaces. The French Academy and Victor Hugo used it in the 1840s as a synonym for rococo [Grand Larousse 1977:5233].

Its extension into beads must have been on the analogy of the texture of beadwork. It was first used for beads in 1647 when H. de Blancourt wrote, "Tous nos mer-

ciers vendent cette rocaille qui sont des grains jaune et verts." [Barrelet 1953:166] (All our tailors sell these rocialle, which are yellow and green beads.)

The term is now used specifically for round seed beads, particularly good ones, made from "hard glass," meaning at least in the Czech context a potassium-lime glass with a high silica content.

**Charlotte.** I do not know where this name comes from. *Charlot* in French is "cart" and these beads were carted into Bohemia to be cut. Charlotte is also a woman's name, but no historical Charlotte seems a good candidate (Charlotte of Bohemia was unpopular there because of her German sympathies).

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### Seed bead names are derived from French, Italian and English words.

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Charlotte was a French term designating the smallest seed beads, the ones Venetians call *margarites*. The Venetian glassmaker Bussolin writing in French in 1847. [Karklis and Adams 1990:74] and the Venetian historian Abbot Zanetti in 1874 [Neuwirth 1994:204] confirm this.

In 1841 Altmüller wrote: "Venetian beads frequently go to Bohemia to be ground and faceted. This is even done with the finest knitting beads which also acquire their facets this way... and then become a new commercial article the two distant countries both have a part in." [Neuwirth 1994:212].

Altmüller was describing what are now called charlottes. They are small rocailles strung on wires and held against a rotating stone wheel. This gives them tiny facets. All things being equal (color, finishing, etc.) these are the most expensive seed beads.

**Bugle.** This term is from English, though based on a misunderstanding of French. Cotgrave's French-English dictionary of 1632 defined *buisune* (Old French for trumpet, bugle) as a pipe, mixing it up with the French word for pipe, *buisse* [Wiener 1922:248] (now *buse* and used only in technical writing).

However, the confusion predates this dictionary. In 1579, Edmund Spenser's *The Shepherd's Calendar* spoke of a girdle "Embossed with bugle around the belt." Two decades later Shakespeare in *As You Like It* described "bugle eyeballs," referring not to the shape but the dark colors of the common English glass bead [See 9[1]:14, 1996 for more details.] The Spencer quote is relied upon for the beginning date of English beadmaking.

Today bugles are short tubes, sold both by diameter and length. They are made of "soft glass," ordinary soda glass, and are less expensive than rocailles.

**Macca.** This is a term not much in use today, but very important historically. The word is Italian meaning "in abundance," but why it is applied here, I do not know. It refers to bugles with six sides. These were commonly black, and they are the basic tubes for two-cut beads.

Carroll [1917:20] said that Lorenzo Graziati first produced them in 1860 and that Giuseppe Zecchin and others later developed them later. He said they were made by "subjecting the tubes to enough pressure to give them facets..." However, patents from 1864 by J. Bassano and 1867 by Zecchin show molds for shaping gathers, not any sort of pressure technique [Neuwirth 1994:108-9.]

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### "Cut Bead" doesn't always mean what one might think.

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**Two-cuts (Hexagonals, Hex cuts).** Once you have maccas, it is no problem to

make two-cut beads, as they are just segments of these tubes. The term is confusing, but was in use for these beads at least by 1900 [Neuwirth 1994:432]. The only cutting done to them is to sever them from the tubes. They are cheap and a handy source of faceting effects.

**Three-cuts.** These are two-cuts strung on a wire and put against a grooved, rotating stone to facet the edges of the beads. This often makes them too biconical, so they are ground again on a flat stone at their equators to round them off. Being much more labor-intensive, they are more costly than two-cuts.

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### Colors are added to beads to take advantage of hues impossible to make in glass.

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**Lined beads.** These are made from clear or transparent tubes. A color or a metallic coating lines the perforation of these beads, giving them particular effects. There are two major types of lined beads: silver-lined and color lined (color inside).

Today both are made in the same way. Segments cut from tubes are put into a vat of dye or silver ammonia nitrate (the backing of mirrors) and stirred so to be covered inside and out with the liquid. They then pass through the apparatus used to round beads. The tumbling motion removes the color from the surface and the ends of the beads, leaving it on the inside.

In earlier times, color lining was done by drawing a dye-impregnated string through a tube or immersing a tube in dye and carefully wiping off the surface. It was used principally for "coral," a color difficult to make in glass. Silver lining was often done by sucking the material into the tube. By the 1850s a successful silver lining was achieved. Color lining waited for the introduction of aniline dyes

[Neuwirth 1994:63-6]. The first aniline was purple, invented by Perkin in England in 1853. Other colors followed and the industry grew through the 1860s. By 1877, Germany was the leading maker [Barrowcliff and X 1942:806].

Color lining will fade in the sun and will flake out. Silver lining can flake and the silver will oxidize. Varnishing can slow these processes.

**Luster (Rainbow A.B.).** This is a surface technique. Beads are sent through a chamber in which metals have been volatilized into fumes. The particles melt into the surface of the beads, producing an attractive effect. Lustering appears in reports on the Czech industry as early as 1856 [Neuwirth 1994:374-5], but lustered beads did not become common until around 1873 [ibid.:67].

Rainbow is a refinement of luster. While lustering only gives a bead a shiny finish, rainbow adds colors to it. It stands halfway between lustering and A.B.

The most spectacular luster was developed by Swarovski of Austria. The metallic particles are smaller than a wavelength of light, giving a brilliant finish known as Aurora Borealis (A.B.). It was commercially available beginning in 1956. It and its cousin, "Glacier Blue," are rarely (never?) used on seed beads.

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### Surface finishes add even more interest to the beads.

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**Irisizing.** This is another surface treatment with a history that parallels that of lustering. In this method, beads (commonly black ones) are put into a vat with lacquer in which are suspended metal particles. The beads then go through a furnace that burns away the organic material and leaves the metal adhering to the surface. L.V. Pántotsek invented the process in 1856 in Hungary. Again, it seems

to have been introduced for beads on a large scale around 1873 [ibid.:67].

**Galvanizing and metalizing** are allied to irising, using often precious metals in several steps to completely coat the bead with a metallic surface.

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### Different glasses are used for several effects.

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**Alabaster, Opal and Chalk Glass.** Alabaster and opal (what I believe the Czechs call chalk) glasses form a continuum. They contain particles, often tiny crystals, that scatter light. Opal glass is opaque and commonly used as the base for the best artificial pearls. Alabaster glass has fewer and larger inclusions than opal and is translucent when thin. [Scholes and Green 1975:326-9]

**Dyed or Colored Glass.** Ordinary glass can be colored on the surface. There is an 1818 description of how to heat finished beads and coat them with powdered metals, letting the color matter adhere to the surfaces. During most of the 20<sup>th</sup> century, beads were dyed in a process called "etching" or "through exchange" [Neuwirth 1994:43, 62], the details of which I have not learned.

It is most common to dye or color seed beads of opal and alabaster glasses. This produces colors not otherwise possible, particularly pastels. When looked at closely, the beads have patches of color rather than one color throughout. The coating wears off in time.

**Ceylon Pearls.** The earliest use of this term I have seen is on a Venetian sample card dated to 1899; it is still in use. Initially it referred to an alabaster glass lined inside and lustered. More recently, it is more common to dye the alabaster glass and luster it.

**Satin Glass and Atlas Beads.** Neuwirth [1994:153] said these terms are "ap-

parent synonyms" and that "Atlas" is probably the later of the two. However, "Atlas" was used as early as ca. 1800 for a type of seed bead [Francis 1988:39]. Atlas beads are made from satin glass, and are pentagonal in section. Larger ones were ground off at their ten corners.

Satin (also silky and satinized) glass gets its sheen from many tiny bubbles running through it. These are stretched out with the tube to form long, thin holes through the bead (hold one up to a light and look at the ends). Originally, the bubbles were created by stirring the glass vigorously [Neuwirth 1994:153]. Chemicals are also added to the batch to produce bubbles.

Atlas (pentagonal satin) seed beads go back to at least 1800. At least by the 1950s and perhaps much earlier, they were replaced by bugles with round or hexagonal sections.

**Square Hole.** I believe square (also triangular and hexagonal) holes in seed beads were made possible by the Riedl drawing machine introduced in 1886 and still in operation for this purpose (see 9[2]:5, 1996).

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### Many seed beads combine different special effects.

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Faceted-holed beads are used in conjunction with silver lining to give a faceted look to the whole bead. If the tube is twisted when drawn, a unique shimmering effect is achieved with massed beads.

Several of these latter terms are really composites. Many of the processes detailed here can be used in conjunction with one another, as the Ceylon Pearl alone demonstrates. Some processes would never be used together (Who would line a black macca?), but often several of them are combined on the same bead.

I believe that one of the most interesting things I have learned while working on this project was that cooperation among European beadmakers was very crucial. In earlier works, other writers and I have emphasized rivalry, particularly between Venice and Bohemia. There certainly was competition, and that was always healthy, spurring the glassmakers and the beadmakers to produce better projects.

Yet, there was also collaboration between the beadmakers. The stories of charlottes, as well as maccas, two-cuts and three-cuts illustrate the situation. The fact that Bussolin published detailed accounts of Venetian beadmaking in French is another example.

Can we credit the wide similarity among beadmakers in terms of names and techniques to this cooperation? To some extent, yes. Certainly, the use of similar names indicates a willingness to conform to established uses. However, we can't take this too far. For example, it is not clear how much cooperation there was between the Japanese and European seed bead makers, yet they produce basically the same beads. The one exception is Miyuki's Delica beads, but the Czechs are working hard on their own to duplicate them.

What will the next advance in seed beads be?

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### Palau Heirloom Beads

Palau (Belau) is the westernmost large island of Micronesia (the "tiny islands"), directly north of western New Guinea. Linguistically, Palauan is only one of two Micronesian languages (the other is spoken on Guam) related to the Western Austronesian group spoken in Indonesia Malaysia, the Philippines and Madagascar.

The "bead money" of Palau was first recorded by Captain Henry Wilson, who wrecked the *Antelope* off the island in 1783. Since then, much has been written about these heirloom beads, but little revealed. A principal problem was that they are highly valued and kept very secret.

Now the secret is leaking out. Mandy Thijssen-Etison (*Palau: Portrait of a Paradise* n.d. NECO Maritime Corp., Koror, Palau) persuaded many Palauans to show her their beads and even to photograph them. The result is the most complete corpus of these beads, all in color, many identified by a generic and an individual name. For the first time, it is possible to identify the heirloom beads of Palau, dividing them into four groups:

1. Indo-Pacific beads. The "trade wind beads" (ibid. 41), the *Balang*, out of circulation since the 1920s.
2. The *Bachel*. These most valued beads are crescents of glass bangles drilled on two edges to sit as a gorget. The bracelets probably came from mainland Asia. Only more work (including analyses) will pinpoint their origin. They were cut and drilled locally.
3. East Javanese glass beads.
4. Monochrome beads difficult to assess without personally examining them.

Indo-Pacific beads are no wonder, and the origin of the bangles needs to be located, but the biggest surprise is that all the spectacular East Javanese beads are found in Palau.

The most widely owned and highly valued bead is the white-spotted eye bead with a yellow center (*chelbuchebe*, strictly the *Meringal Chad*, "precious"). [I had known this before.] Large *Pelangis*, (*Kluk*), small twisted striped beads (*Smesmob*); mosaic beads (*Ngirbidul* and an "unknown type"), and possibly the "Big Yellow" (*Bleob* of the *Kldait* group) (ibid. 42-3) are all in circulation.

This demonstrates there was active contact between Palau and East Java between ca. A.D. 600 to 900, when these beads were produced. The prehistory of Palau is unknown. This is a chapter in an otherwise blank book. Some believe the Palauans arrived from Indonesia (note the linguistic connection). From East Java?

These beads actively circulate as money (up to \$30,000 each). Three classes were devalued during the 1920s when the Japanese controlled Palau:

1. Indo-Pacific beads, which probably served as small change and was replaced by Japanese and then American coins.
2. Translucent green *Bachel*, driven out by imitations made from the bases of bottles (by whom?).
3. Beads made by slicing larger beads (a case of altering) used in a dowry ritual made defunct under the Japanese.

The important collections are held by older men, either their own or the clan's. Women usually wear one bead loaned by their husband's clan, but can inherit them from their mother or husband.

The collections are closed except that 1.) They were increased by cutting up beads and bangles. 2.) Beads from looted Indonesian sites are being sold locally. They are said to be worth less than the ones on the island with histories attached to them. It will be interesting to see if these looted beads achieve value on Palau.

Again, beads are helping to write the story of a people.