

DOMINIQUE BUSSOLIN ON THE GLASS-BEAD INDUSTRY OF MURANO AND VENICE (1847)

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One of the earliest detailed descriptions of the Venetian bead industry is contained in an obscure book published in French in 1847 by the Venetian glassmaker Domenico Bussolin. Intended as a "Guide for the Foreigner," this work contains much useful information concerning bead manufacturing techniques and the socioeconomic aspects of the industry. To make this text generally available, a translation prepared by Karklins and Adams is provided here.

INTRODUCTION

In 1847, Dominique (Domenico) Bussolin published his treatise on "The Celebrated Glassworks of Venice and Murano: A Historical, Technological and Statistical Description of the Industry Divided into its Various Categories, with Notes on the General Trade in Fine and Common Beads." Despite its broad scope, all but 17 of its 86 pages are devoted to the manufacture of drawn and wound beads, as well as the historical and commercial aspects of the glass-bead industry. While much is already known about these subjects, Bussolin presents a variety of details not found in other accounts. Furthermore, not only is the text based on firsthand observation, but Bussolin was an expert glassworker with several important accomplishments to his name (*see* endnotes 5 and 33). Thus, his words have a ring of truth and accuracy that is not always present in the accounts of novice observers. Because of the importance of Bussolin's treatise to our understanding of the Venetian/Muranese bead industry, coupled with its relative obscurity, especially in North America, an English translation of the relevant chapters of the French text is presented below (chapters 8-11 have been deleted since they deal with the production of glassware, mirrors and window glass). Page numbers in the

original volume are shown in brackets. To avoid confusion, it should be noted that the endnotes are Bussolin's, while the bracketed in-text notes and the Conclusion and References Cited sections were prepared by Karklins.

A few comments on some of the terminology will help the reader to better understand the text. Bussolin differentiates between beads made of enamel (*émail*) and glass (*verre*). As used herein, the former is a high-quality glass, transparent or opaque, that probably had its clarity and brilliance enhanced by the addition of lead oxide. "Glass" would be less refined and cheaper.

The term "quality" (*qualité*) as applied to the glass and enamel used to make beads equates with "kind," "type" or "grade." There were various compositions of glass, each with slightly different properties. Thus, coupled with the skill of the glassmaker, a glass could be hard, clear and lustrous, or soft, dull and full of bubbles.

THE BUSSOLIN TRANSLATION

Chapter One. General Categories of the Venetian Glassworks. [p. 5]

The Venetian glassworks can now be divided into four major categories:

1. Factories producing enamel or colored-glass beads, generally known as *jais*, *rocailles*, or *conteries*.
2. Factories producing glassware and assortments of same.

3. Factories producing mirrors.
4. Factories producing window glass.

More than any others, factories producing *conteries* are of special interest to foreigners because of the unique character of the product, and because they are unrivalled in any other country.

The term *conteries* [p. 6] includes small embroidery beads known as *marguerites* (*margheritine*) and all the various types of beads made of enamel and colored glass, generally known as "Venetian beads." We will begin with a discussion of this branch of production.

Chapter Two. The Production of Glass Beads or Conteries, and its Various Branches.

Conterie production can be divided into three branches, each represented by separate factories or trades.

1. The art of preparing and coloring the molten enamel and glass. This is the chemical aspect.
2. The art we refer to as *del margaritaio* (*du margaritaire*), which involves transforming the enamels into beads with specially built furnaces and specific procedures.
3. The art of the *patenôtrier*, enameller or producer of lamp-wound beads.¹ [p. 7]

The first of these arts is the most important, and fundamental for the other two, since it provides them with the material necessary for their work. It requires quite unusual theoretical and practical knowledge; hence, the preparation techniques, such as the proportions of the various materials used in preparing the enamels and the coloring techniques, are still regarded as trade secrets.

Under the laws of the Republic, each of these three arts was to be practiced separately: the first only in Murano and the other two in Venice. Now, however, a visit to a *conterie* factory reveals all aspects of the process from the beginning to the achievement of the perfect bead through the art of the *margaritaire*.

The art of making lamp-wound beads [p. 8] still remains separate. Those who practice the art live in Venice and have their workshops in their own homes.

Factories which produce *conteries* can be divided into two categories according to the quality of the items they produce:

1. Factories producing enamels [*émaux*] or fine *conteries*.
2. Factories producing *rocailles*, or ordinary *conteries*.

A visit to an enamel or fine-*conterie* factory is sufficient to understand this type of work. We will provide a description.² [p. 9]

Chapter Three. Description of a Factory for the Production of Enamels or Fine Conteries and the Work Carried Out.

On entering one of these factories, the first thing to be observed is the special construction of the furnaces where the pastes [frit] are melted. These furnaces normally contain three, four, and, at times, five pots or crucibles; they are separated from each other so the heat can be controlled at will according to the quality of the glass or enamel to be melted.

The most important activities carried out in these factories include [the production of]:

- a) Tubes of different qualities and sizes of enamel and colored glass which are then cut and formed into beads by the *margaritaire* workers.
- b) *Baguettes*, or solid canes made of the same materials and used [p. 10] to make beads by the *patenôtrier* workers or wound-bead makers.

These factories also produce enamels for mosaics or other articles of jewelry, as well as glass to imitate all kinds of precious stones.

The operation for producing enamel or colored glass tubes for the *margaritaires* is the most complicated and the most worthy of observation. It involves forming the vitrified material into long tubes of varying thickness according to the intended size of the beads, but in such a way that the tubes are perforated along their entire length.

This operation is carried out by a master-worker called a *scagner* (*de l'escabeau*) who has one or two assistants and four pullers (*tiradori*) under his command. The assistant begins the operation: with a small iron bar about 4 *pieds* [4 ft., or 1.3 m] long, a gather of well-fused enamel is removed from the

crucible and formed into a roughly cylindrical shape by rolling it on a horizontal slab of iron or cast-iron (*marbre* [marver]). [p. 11] At the same time he uses pincers to open the end of the cylinder.

Following this preparation, the master-worker takes the iron bar and reheats the enamel to the necessary temperature, taking care that the hole which has been formed remains perfectly centered. Then, with all possible speed, he attaches another iron bar, called a *consaura*, to the upper end of the small enamel cylinder. Finally, two other workers (pullers) grasp the bars and, running in opposite directions, draw the enamel, which is still hot, soft, and ductile into a long cane or tube of a given thickness, perfectly round and perforated throughout its length.³

It is to be noted that the fineness of the tubes depends not only on the amount [p. 12] of enamel used, but on the speed at which the pullers run.

For the manufacture of small embroidery beads (*marguerites*), the enamels must first be formed into long tubes. The Venetian industry is eminently distinguished in this type of work, which is unrivalled abroad. The color of the tubes varies according to the quality of the materials and the metal oxides used in preparing the glass.

Some types of beads are made of two differently colored layers of enamel applied one on top of the other. To achieve this, the enamel or colored-glass tubes are specially prepared in the following manner. The worker first scoops a mass of opaque enamel called *sottana* from the crucible with his iron bar. He then shapes it into a cylinder, and after opening the end as just described, he covers it with a second layer of transparent enamel of a different color, which is ready [p. 13] in another crucible in a molten form. The operation continues, and, when pulled, the two enamels spread uniformly along the entire length of the tube.

If an opaque white enamel is covered by a ruby-colored enamel, the result is a very bright carnelian [*cornaline*] color. Covering an opaque yellow enamel with that same ruby-colored enamel results in a very pleasant coral shade. In this way, a variety of colors can be produced according to the various qualities of the enamels used.

While watching the pulling of the tubes, it is worth noting that in any ruby, rose or yellowish-amber-colored glasses (i.e., those compounds colored with gold oxide or silver oxide), the true color is not immediately revealed at the tube stage; instead it is developed during a subsequent operation when the tubes are heated to form them into beads.

Pulling enamel or colored glass into long rods [*baguettes*] [p. 14] which are used in the production of wound beads is easier and faster than the tube process for *margaritaires*. The rods are solid and generally have a diameter of 3 *lignes* [$\frac{1}{4}$ in., or 6.7 mm].

Enamels intended for mosaics and articles of jewelry are formed into small cakes according to an even simpler and easier operation. The worker uses the top of his iron rod to remove a small amount of molten, well-fired enamel from the crucible and drops it on the castiron slab mentioned above. It spreads out naturally into a round, flat shape about 3 *pouces* [3 in., or 8.1 cm] in diameter. The cakes are immediately placed into a cooling (annealing) furnace where they are left for a few hours to cool bit by bit; if this precaution were not taken, the cakes would break easily.

We shall now discuss the conversion of the enamel tubes into beads: the art of the *margaritaire*. [p. 15]

Chapter Four.

Article 1. The Art of the Margaritaire, and the Division of Labor. Most of the large *conterie* factories in Venice and Murano also have *margaritaire* workshops for converting the enamel tubes into beads. However, there are still *margaritaire* workshops in Venice which, as we said at the beginning, limit their production to beadmaking, and have nothing to do with the preparation of enamel and colored glass.

The art of the *margaritaire* can be divided into six major operations:

1. Sorting the enamel and colored-glass tubes.
2. Cutting the tubes. [p. 16]
3. Rounding, or the manner in which the beads are formed.
4. Sorting the different sizes of beads with screens.

5. Polishing the beads.
6. The way of stringing them, or forming hanks (*masses*).

Article II. The First Operation -- Sorting the Enamel and Colored-Glass Tubes. Since it is almost impossible for the tubes resulting from the work discussed above to be of an equal diameter throughout their length, it is necessary to sort them according to size before cutting them. This work is usually carried out by women called *cernitrici* (sorters), who sort the tubes very skillfully with their fingers. [p. 17]

Article III. The Second Operation -- Cutting, or the Manner of Cutting the Enamel Tubes. The cylindrical enamel tubes, sorted or divided by size, go to the cutters [*tailleurs*], who convert them into small, perfectly uniform pieces. The worker sits on a small chair: between his legs he holds a small bench into which is set a perpendicular steel chisel. The chisel is about 3 *pouces* [3 in., or 8.1 cm] wide, set parallel to a half-cylinder called the *scontro*, or regulator, which serves as a guide for cutting the tubes to the required length. The worker takes a handful of the tubes, spreads them out in his left hand, and places one end horizontal to the fixed chisel. With another chisel of the same size held firmly in his right hand, he taps rapidly and repeatedly [p. 18] on the tubes which advance in a measured fashion, thereby reducing them into small, regular pieces.

About 25 years ago [1822], Captain Longo invented an enamel-tube cutting machine to replace manual labor. The machine has four or six fixed chisels lined up horizontally and other, corresponding striking chisels are mounted on a curved handle shaped like a hammer. These chisels are set in motion by a cylinder and strike the fixed chisels. The enamel tubes are placed perpendicular to these chisels, and drop down by their own weight to be cut at their bases by successive blows of the falling chisels. This machine requires two workers: one to turn the cylinder, and the other to continually replace the cut tubes with new ones. This second worker is also responsible for sharpening the striking chisels when necessary. However, as this machine lacks the required precision, and [p. 19] is not equally suited for all sizes and qualities of tubing, it has not been generally adopted.

The resulting tube segments, whether produced by hand or machine, are angular and sharp, and must undergo an operation to make them round. First, however, they go to the worker called the *schizzadore*, or screener, since he uses a screen to separate the pieces or small tubes from the cutting debris (*coupage*).

Article IV. The Third Operation -- The Manner of Rounding the Beads in the Margaritaire Furnace. The small, regularly cut cylinders of enamel are rounded and converted into beads in specially designed furnaces. There are two types: the *ferraccia* furnace, and the "tube" furnace. [p. 20]

In the past, only *ferraccia* furnaces were used, but in 1817, Mr. Louis [Luigi] Pusinich introduced machines, or "tubes," which allowed the beads, mainly *margaritines*, to be more perfectly rounded.

The machines for rounding the beads are made of various materials: castiron, rolled iron, and copper sheeting. The machine is about 16 *pouces* [17 in., or 43.3 cm] long and shaped like the breech of a cannon; a metal bar which acts as an axle passes lengthwise through the center of the drum.

The beads are rounded off as follows. The small pieces of enamel, cut as described, are poured into a mixture of lime and ground charcoal which has been reduced to an extremely fine powder and moistened slightly with water. The tube segments are stirred into this mixture, called *siribiti*. The *siribiti* is then rubbed between the hands, which forces the mixture into the holes of the small cylinders, thus blocking them temporarily. [p. 21] This is purposely done to preserve the hole during the next operation.

An appropriate quantity of these prepared enamel pieces are taken and placed in the tumbling machine, or "tube," along with some sand, and occasionally some powdered charcoal as well, depending on the quality of the enamels. This second mixture is used to prevent the heat from causing the aforementioned pieces of cut enamel from sticking to one another. Finally, the "tube" is placed in the furnace. It is turned constantly in a very hot fire which is increased or decreased according to need. When the edges have been blunted and the fragments have become rounded -- in other words, when they have been converted into beads -- they are poured into a copper or iron receptacle where they are left to cool. Then, using a

screen, the beads are separated from the sand. To remove the mixture from the holes in the beads, they are placed in a bag and thoroughly shaken. [p. 22]

The operation carried out in the *ferraccia* furnaces is quite different. *Ferraccia* are certain copper pans [*poêle*] about 10-12 *pouces* [10-13 in., or 27.0-32.5 cm] in diameter which are used to round off some types of beads, primarily the largest ones and the ordinary *conterie*.

The *ferraccia* containing the pieces of glass or enamel to be rounded off is put in a reverberatory furnace where a very hot fire is maintained: the pieces of enamel or colored glass, mixed with sand or powdered charcoal, are stirred continually with an iron rod, and once the beads are rounded, they are set aside to cool, and the holes unblocked in the manner described earlier when discussing the tube machines. The preferred fuel for this type of work is bundles of well-dried willow sticks. [p. 23]

Article V. The Fourth Operation -- The Separation of Beads by Size Using a Screen. Once the beads have been rounded using the technique just described, they are turned over to another worker called a *governadore*, who uses increasingly fine screens to separate the beads according to their various sizes. He then takes a very flat wooden tray on which he pours a handful of beads: he holds the tray at a slight angle and shakes it gently so that the perfectly round beads separate from those that are not. Those that are not round remain on the tray, whereas the others, on the contrary, roll quickly downwards. [p. 24]

Article VI. The Fifth Operation -- Polishing the Beads. The beads are turned over to a further worker called a *lustratore* (polisher) to remove all the dust they have accumulated both inside and out, and to give them the necessary shine. To this end, they are thrown into a bag with a little sand and shaken; the sand is then removed with a screen. Finally, they are put into another bag with a certain amount of bran. They are shaken again, the bran is removed, and the beads come out with a perfect shine.

Article VII. The Sixth Operation -- Stringing the Beads. This is the final operation. The beads are turned over to women who use long, very fine needles [p. 25] to string them and form them into hanks (commercially referred to as *masses*) of varying sizes

according to the quality and the size of the beads; for instance, *margaritines* for embroidery are strung in *masses* of one hundred twenty strings, 5 *pouces* [5 in., or 3.5 cm] long. The beads are arranged in this way for commercial delivery.

Chapter Five. Faceted Beads and Matte Beads.

Before we leave the subject of *conterie* production, faceted beads and matte beads should be mentioned. Just as precious gems take on more shine and a more pleasant appearance when they are cut and polished, it was thought that *margaritines* or embroidery beads, as well as other qualities of beads, could be cut; in fact, *margaritines* cut in this way do produce a most beautiful effect when used on fabrics and in embroidery. [p. 26]

Our beads are cut quite easily in Bohemia, and at very reasonable prices. So that is where they have been shipped for a long time now to undergo this further process. It should be noted that cut colored-crystal beads are also produced in Bohemia. The type of process, however, is very different and the product should not be confused with the beads produced in the Venetian factories.

Other beads, on the contrary, are matted in our factories; in other words, the shine is removed from the [transparent] glass which, through this operation, becomes semi-transparent.

Chapter Six.

Article I. The Art of the Patenôtrier or Wound-Bead Maker (Perlaire). The art of the *perlaire*, formerly known as a *patenôtrier* or a wound-bead maker, is one of the main branches of the Venetian *conterie* industry, and merits special attention. [p. 27] In this work, the *perlaire* uses rods composed of enamel or colored glass as the raw material. Using the flame of a lamp, the beads are shaped as desired, and decorated with various colors and designs. Those of our readers wishing to observe this process must go to Venice; as stated previously, the *perlaires* have their workshops in their own homes.⁴

Article II. Description of the Work of the Perlaire or Wound-Bead Maker. On a workbench there is a

lamp fuelled with melted tallow; a bellows is used to direct the flame [p. 28] horizontally and diametrically away from where the worker is seated.⁵ The worker holds a piece of a rod of enamel or colored glass in the right hand and brings it into contact with the flame; the left hand holds a piece of iron wire covered with a mixture of glue, lime [*chaux*] and white clay from Vicenza [*terre blanche de Vicence*] which keeps the beads from sticking to the wire. [p. 29]

The enamel or colored-glass rod heats up and melts in an instant, and winds itself around the iron wire, taking on a rounded shape. The worker then shapes the beads as desired, either by a simple movement of the fingers, or using small molds. To create flowers or other decorations on the beads, the worker takes differently colored enamel threads which are melted at the lamp; in this way all kinds of designs are executed, as if with a paintbrush.

Another remarkable practice of the *perlaire* is reducing glass to very fine silk-like threads. This process, which has recently caused much astonishment in France and in Belgium, has been known here for a very long time. The glass thread is formed by a very easy process. It is a simple matter of stretching it out by pulling while using a lamp flame to keep it soft and almost molten. To do this, one end of the glass thread is attached to a revolving wheel, about 2.5 *pieds* [2.5 ft., or 80 cm] in diameter, which is turned rapidly [p. 30]: the glass lengthens, winds onto the circumference of the wheel, and is reduced into hanks. The threads are of different colors, depending on the quality of the glass used.

Since glass thread is very flexible it can be used to manufacture various fabrics. Mr. Olivo of Venice was the first to distinguish himself in this type of work, also making baskets, small vases, and other articles. Then Mr. Tommasi perfected the process, leaving little or nothing to be desired.

Stuff for tapestries is also produced using glass threads interwoven with silk threads, but no matter how beautiful these fabrics may look, they must only be used with great care. Although glass threads are made to hold together, from time to time one of the threads may give or break, and the tiny pieces of glass thread, almost invisible and very sharp, could cause very small [p. 31] but, nonetheless, very annoying injuries if one is pricked with one.

Please note that this process is not to be confused with the ancient manufacture of lace and filigree glass in the Murano factories, which will be discussed in one of the following chapters.

Chapter Seven. The Various Qualities of Beads, and Other Articles, Known in the Trade as Conteries.

From all that has been said, we can recapitulate that the beads known commercially as *conteries* fall into three main categories:

1. Beads known as *margaritines* for embroidery, or *charlottes* in the trade.
2. Beads or real *conteries*, of varying sizes and qualities, also known commonly as *jais* and *ro-cailles*. [p. 32]
3. Beads made at the lamp, or wound beads, used in making chaplets, ladies' necklaces, bracelets, earrings, pin heads, etc.

The factories of Venice and Murano, as we have stated elsewhere, are still known for enamels in cakes of different colors, which are in great demand throughout Europe. They are used in mosaics, in watch and clock faces, and in thousands of pieces of jewelry. The imitation of all types of precious gems should also be mentioned, especially the famous aventurine or *astroit*, a unique composition in which a cluster of flakes sparkle and shine, resembling gold.

[Chapters 8-11 (pp. 33-50) have been omitted as they deal with the manufacture of glassware, mirrors, window glass and glass globes.]

Chapter Twelve. On the Origin of Venetian Beads (Conteries), and Ancient and Modern Trade in Them. [p. 51]

We know that the ancient Egyptians became famous not only for their glass factories, but also for their clay pottery which they were able to coat with various colors of glass. This method was used to make vases, household utensils, and many articles of adornment such as beads, amulets, etc., which we still find with many mummies.⁶ Nothing could have been easier for the Venetians. As of the 6th and 7th centuries, they had frequented [p. 52] Egyptian ports;

as they expanded their trade, they sought new types of industry to introduce in their country, and from Egyptian beads they drew some idea of the making of glass and enamel beads for which they distinguished themselves -- and still do today.

According to some experts who have written on the subject, the making of these beads started to flourish in Venice during the 13th century.⁷ It is reported that around the same time Marco Polo, returning from his travels in Asia and along the coast of the Indian Ocean, had spoken of the customs of the peoples he had visited and of their taste for agates, garnets, and all types of precious stones, which he encouraged our glassmakers to imitate.

Christophe Briani was the first [p. 53] person whose name we still know to act on this; he continued his experiments with his colleague Dominique Miotto, and together they were able to color glass so that it imitated the aforementioned precious stones. The first shipment of these beads to Basra [Iraq] was highly successful, which encouraged Miotto to take on students and to create a new glassmaking art, the art of the *margaritaire*, from the word for garnets and other precious stones then known in Venice by the generic name of *marguerites*.

It is said that before glass beads were produced in Venice, bone and wood beads for chaplets and rosaries were made there and shipped to the Holy Land. Later, one André Vidaore introduced the process of making beads at the lamp. In this way he made some multicolored ones and others decorated with gilt. In 1528, he obtained a matricula from the Committee for the Supervision of Arts and Trades, and founded the art of the [p. 54] *perlaires*, known in the past as *suppialume* ["lamp blowers"].⁸

Since these articles were adapted to the taste of the Eastern nations to which they were shipped, and since they were adapted to their uses, the Venetians expanded their production, reaching an incredible, constantly increasing rate, which expanded beyond measure. Venetian beads were sold to merchants at ports on the Black Sea, in Suristan and in Egypt, where they were traded for spices and herbs from the interior of Asia.⁹ From there, caravans transported them to China, and spread them throughout the islands of the Indian Ocean.¹⁰ [p. 55]

A great many were also destined for the Asian and African coasts of the Red Sea, and Ethiopia and

Abyssinia. These peoples used the beads not only as ornaments at the neck, in the ears and on their clothing,¹¹ but also to decorate their dwellings and, [p. 56] following ancient customs, to cover the remains of the dead in their tombs.

In some countries these beads were so highly valued that they were used as money in transactions. This is the origin of the name *conteries*, (or, actually, *compteries*), as they are still called today.¹²

Wherever Venetians had establishments and enjoyed privileges, on the northern coast of Africa, in Tripoli, in Soussa, in Tangiers, in Fez, in Marrakech, etc., they did extensive trade in *conteries*. Merchants from the interior tribes flocked there to buy them, and mainly traded native products for them. [p. 57] It is worth noting that one of their uses was in large part the purchase of Negro slaves.

When Vasco de Gama rounded the Cape of Good Hope, and, through the marvel of navigation, charted the new route to the Indies, the Portuguese, the Spanish, and then the Dutch and the English replaced the Italian Republics in the great trade with Asia. All the merchandise from the East was then transported to Europe, and European merchandise traveled to the East via the new Ocean route. As a result, *conteries* were already then starting to be transported to the ports of these different nations, where direct trade with Asia was concentrated. The same was later true of trade with the new continent of America and with Oceania. This state of affairs, with occasional changes caused by the political vagaries of the countries, still exists today. It should, however, be noted that the current rate of production of our factories, compared [p. 58] to earlier production, has been increased and considerably improved thanks to the progress of the arts, speedier communication with distant countries, and the new, broader relations we maintain with them.

Present-day trade in *conteries* with England and Holland is not inconsiderable. London and Liverpool on one shore, and Hamburg and Amsterdam on the other, are the major centers for shipping exports to the Americas and the English and Dutch colonies. As a result, immense quantities of *conteries* are consumed, particularly in Africa. Starting with the Moroccan Empire and moving on to Guinea, the Congo, Kaffraria [eastern Cape Province, South Africa], Zanzibar and Abyssinia, everywhere *conteries* are in

great demand, and are used by the Europeans to barter for the natural products of these countries.

France also deals in these beads, mainly with its Senegalese colonies, [p. 59] in exchange for gold dust, amber [this is not a local product; perhaps copal is meant], inlaid wood, furs, and the famous gum arabic. As well, in Paris, Strasbourg and other French cities, Venetian *margaritines* are used to produce quite beautiful purses, ribbons, belts, scarves, sashes, and all kinds of embroidery which are consumed partly within the kingdom and partly used for export.

Spain and Portugal also trade in Venetian *conteries*. However, trade by these two kingdoms -- which was once so extensive because of major exports to South America -- has been very limited for the past few years. Germany and Prussia still consume some of these objects. Lemberg [Lvov] and Brody, in Poland [now the Ukraine], trade in *conteries* throughout Russia. Constantinople is the center for orders coming from Persia, Armenia, and other parts of Asia. Through its location, Alexandria remains an important port for shipping *conteries* along [p. 60] the eastern coast of Africa, and along the Asian shores of the Red Sea. Finally, the Barbary ports supply the markets of all the neighboring African tribes, and from there, *conteries* are introduced into the central regions of Africa itself.

Europe's relations with China, which should be expanded because of recent events, will provide the Venetian-*conterie* trade with new, extremely interesting openings, especially for trade with that country, since the Chinese have always demonstrated a special affection for beaded ornaments which they use as symbols of their dignity, as reported by Macartney in his travels to China, as already quoted. Once the new route via Egypt is regularly established, it could prove very advantageous to this traffic, which would, in fact, be reverting to one of the routes used long ago.

Some types of beads can even be adapted for use by European nations [p. 61] for chaplets, necklaces, hair ornaments, or a few other luxury items. This trade, which is spreading without competition throughout the entire world, is supplied solely by the Venetian factories. On many occasions in the past, foreigners have tried to discover the methods of manufacturing *conteries* so as to import them into

their own countries. Their efforts have always been in vain. The complexity of the operations, the jealousy with which the expert craftsmen have guarded the secrets of their compositions, and the strictness of Venetian laws have always frustrated their attempts. [Although Venice did dominate the glass-bead industry, it certainly did not have a monopoly on bead production, Bohemia being a major competitor. Furthermore, it is a fact that, despite severe penalties, many Venetian glassworkers were lured to other countries where they divulged their beadmaking secrets.]

When, in 1797, the French took possession of Venice for the first time, the goal of exporting this branch of industry to France did not escape the attention of the republican envoys, and in 1798 the Executive Directory gave a specific order to General Berthier. Here is his reply:

It is with regret that I must inform you that I have not succeeded [p. 62] in the task you set me in your letter of 5 Nivôse [Dec.-Jan.]: to take the secret of the manufacture of *margarites* from Venice. I hope to send the report of those I had handling this matter by the next courier."¹³

One should not be surprised that, at the time, arts and trades guilds still existed in Venice;¹⁴ those approached by General Berthier did not make it easy for him to achieve his intended goal. One must also remember that the general, busy on Napoleon's orders with the famous Italian wars did not have time to expand his research and to approach those actually practicing the art, as the subject required, since it was an art familiar to very few, and divided by the laws of the day into several branches totally different from one another. [p. 63]

Chapter Thirteen. A Few Regulations Regarding the Murano Glassworks at the Time of the Republic of Venice, and the Privileges it Granted to the Residents of Murano.

Since the power of the Republic of Venice was due entirely to trade, it was certainly in its interest to encourage the national industry of the Murano glassworks, which, as we have said in previous

chapters, represented one of the most significant export branches, and brought immense wealth to the state. In his civil and political history of Venetian trade, Marin states:

The glassworks have always been the government's most prized possession: countless measures have been taken to increase and perfect the work, and to maintain, [p. 64] in so far as possible, an exclusive flow into neighboring countries, as into the most distant lands."¹⁵

As of 1318, the Murano glassworks were separated into various categories according to the quality of their products. Each category was subject to special laws which, with time, have undergone various changes according to circumstances.

According to the last register (*Capitolare o Matricola*), these factories were divided into the following four categories:

1. Blown-glass and crystal factories.
2. Window-glass and mirror-glass factories.
3. Factories making "ordinary" canes [tubes] for *conteries*.
4. Factories making canes [tubes] intended for *margaritaires* and *perlaires*, and enamel cakes.

The register (*Matricola*), commonly called the *Mariegola*, was a handwritten register in which all the [p. 65] regulations relating to the professions in question were written down as soon as they were promulgated. It is worth noting that the three professions of *miroitier* [mirror maker], *margaritaire*, and *perlaire à la lampe* [wound-bead maker], whose workshops were in Venice, were regulated by registers separate from the Murano register; the art of manufacturing glass and enamels was considered a primary art, and was separated from the secondary branches of glassmaking in order to make emigration more difficult.

To guarantee strict supervision of the glassworks, an office called *del Comparto* (of division)¹⁶ was established on Murano. It was made up of nine individuals: five were elected by the factory owners, and four by the working class. Membership was renewed every year. They made sure order was maintained within the factories, and resolved within the art any questions which [p. 66] arose. Towards the

end of the Republic, this office was subordinated to the Council of Censors in Venice.

Amongst the regulations included in the register was one which required each factory owner, at the beginning of the year, to declare to the *del Comparto* office the quality and quantity of crucibles he intended to maintain. The work year began October 1 and ended the following July 31; in other words, there could be no increase or variation in production over that forty-four week period. To allow these orders to be carried out, two representatives of the art (called *soprastanti*), responsible to the *del Comparto* office, were selected; they had the right to enter the factories, day or night, at will, to inspect the work.

Another important regulation was the one regarding apprenticeship, including the tests to be passed by those wishing to register with the workers' guild. [p. 67] There were two excellent results: first, the products were of proper and perfect quality; second, the production levels of the factories were maintained at the level of commissions or consumption.

The Republic of Venice took such care to maintain, even among foreign nations, the reputation of this branch of the industry, and to prevent the circulation of defective products, that one decree amongst many others, dated March 20, 1764, from the Council of Censors, stated:

Be it known and understood that any attempts at forging objects produced at the glassworks in Murano shall be irrevocably halted, following removal of the counterfeit products. Criminal proceedings shall be instituted against the offenders *in absentia*, and an ongoing secret investigation shall be opened with a view to subjecting the offenders to the severest of punishments, in reparation for the public and private damage caused.¹⁷ [p. 68]

At different periods, the Murano glassworks were under various magistratures. We will mainly point out that as of February 23, 1490, their superintendency was entrusted to the heads of the Council of Ten, and that on October 27, 1547, the council decided to take on the job of ensuring that the art was not transported outside the state.¹⁸ These proceedings were confirmed by the resolutions (*Parti*) adopted in the *Maggiore*

Consiglio on March 22, 1705, and April 13, 1762.¹⁹ The second of these resolutions established

That [p. 69] the heads of the Council of Ten protect the art, using the most secret and severe means that they, in their wisdom, consider necessary, ensure that no person employed in the glassworks leaves the state for foreign countries.²⁰

Consequently, it was forbidden, subject to the most serious penalties, for all those belonging to the art of the glassmaker to divulge its secrets. Those who left the Venetian state without the permission or the knowledge of the Council of Ten were condemned to death.

The following decision of the *Maggior Consiglio* of April 13, 1762, also stated that "all matters relating to the art of the glassmaker were to be regulated by the Senate through administrative means."²¹ [p. 70]

Again on April 13, 1662, the Council of Five Sages was required to prepare a report on the state of these professions, and to suggest the means most appropriate for their prosperity. This is what led to the council report of January 30, 1762 MV (1763), in which various changes to the old laws were proposed. It was also as a result of this council's opinion that the superintendency of the art of the glassmaker was handed over to the Council of Censors, with one of the three State Inquisitors as an assistant.

Later on, the laws of 1806 established freedom in these provinces for the arts and the trades, and abolished all guilds. Because of these laws, anyone -- foreigner or national -- regardless of status, can set up a [p. 71] glassworks or work in one. Anyone can move his factory wherever or whenever he wishes, since the manufacturing of *conteries* has the same status as all the other arts.

While these general provisions may seem profitable and encouraging for national industry in the case of professions also known and practiced in other countries, they do not seem to be applicable to a kingdom or a town which wishes, as in this case [Venice/Murano], to preserve an exclusive native industry. But as the maxims of the new legislation of these provinces relating to arts in general did not correspond to those of the government of the Republic of Venice, it was normal that the specific regulations

relating to the art of the glassmaker, the *margaritaire*, and the wound-bead maker could not be preserved in any way either.

If, on the one hand, the strictness of the Venetian laws against glassworkers who betrayed their country was severe, the Republic did, on the other hand, grant special distinctions and [p. 72] privileges to the Muranese, particularly those who belonged to the glassmakers' art, to bind them to the government. The following are some of the main concessions:

1. In 1445, Murano received from the Senate of Venice the rare privilege of electing in perpetuity, from amongst its citizens, a chancellor called the *chancelier prtorien* [praetorian chancellor], specifically *sicut factum fuit*, as in the statute, *comunitati Clugiae, et Modoni, et Coronni, et civitatum insulae Cretae*.²²
2. Murano maintained its nuncio in Venice for matters which had to be handled there.²³
3. The island of Murano had its own civil, criminal, and administrative justice, whose laws and ordinances made up the code entitled *Statut de Murano*. In 1502, with the approval of the Senate of Venice, the statute was entirely laid down and arranged according to the circumstances of the day, with no [p. 73] further reform until the fall of the Republic.²⁴
4. On February 16, 1601 MV (1602), the Council of Murano passed a resolution, confirmed by the Senate of Venice on August 20, 1602, establishing the privileges of the bourgeoisie (*citadin-ance*) of Murano. This led to the institution of the "Golden Book" in which were inscribed the original families of Murano and, later on, their descendants.²⁵
5. As of the 12th century, the period when Murano was enclosed in Venice, the Republic granted the Muranese the distinguished title of "original citizens of Venice." As a result, they did not require a decree of favor, as was required of subjects born outside [p. 74] Venice or who were not resident there, to always be admitted to the first jobs in the republican ministry of the *Avogaria*, the *Cancellaria Ducale* or foreign courts.²⁶
6. The Muranese had the long-established privilege of having gold or silver coins struck at Venice's *Zecca* each year. These coins were called *Oselle* and bore the epigraph: *Munus Comunitatis Mu-*

riani. The size and the design of the *Oselle* varied over the years. In later days they were stamped on one side with the names and the coats of arms of the doge, the podesta, and the treasurer, as well as the arms of the township of Murano, and on the other side with the names and the arms of the four deputies of the island. The last *Osella* was struck in 1796, under Doge Louis Manin; Sébastien Pisamano was the podesta of Murano, and Zanetti was the treasurer. The four deputies in that year were Georges Barbaria, Antoine Ongaro, François Dal Moro, and François Motta. [p. 75]

7. The Magistrature of the "proveditor of the comune" (*Provveditori di Comun*), as residents of Venice, could not get involved in repairs required to the bridges, streets, and canals of the island of Murano. That was the responsibility of the supervisors (*soprastanti*) of the glassworks, who administered the revenues of a special fund, the *Bezzo*, to cover such expenses.²⁷
8. Those who belonged to the glassmaker's art [guild?] had the right to carry two knives in a single scabbard.
9. Neither the police officers of Venice, nor their leader, the *Missier grande*, could land on Murano. If by chance a Muranese were to commit a crime, the magistrates of the island handled the imprisonment of the culprit, handing him over later to the superior courts.
10. Foreigners were not allowed to practice the glassmaker's art. Only the sons of glasswork's owners or [p. 76] of master-workers could set up a glassworks.^{28,29}
11. But the most remarkable and most honorable of all the privileges was that the daughters of the heads of the Murano glassworks could marry patrician noblemen from Venice, and their descendants kept all their degrees of nobility. This privilege is truly extraordinary, considering the quality of the [p. 77] eminently-aristocratic government and the very high degree of Venetian nobility.

Chapter Fourteen. A Comparison of the Factories in Murano at the End of the Venetian Republic and those in Existence Today.

Towards the end of the last century, Murano had about forty-six glassworks, divided as follows:

1. Eight factories, most using three crucibles, making enamel and fine canes [rods and tubes] for *margaritaires* and *perlaires*.
2. Six factories, each with six crucibles, making canes [tubes] suited for ordinary *conterie*.
3. Three crystal factories, not including the Briati factory in Venice which closed about 1790. The three Murano factories each used three crucibles.
4. Four ordinary-glass factories, each with five crucibles. [p. 78]
5. Four mirror factories: one manufactured large mirrors, using seven crucibles; the others made smaller mirrors using five crucibles each.
6. Twenty-one factories making small window panes, each using five crucibles.

Today (1846) there are twelve working factories on Murano, divided as follows:

- a) Four factories producing enamel canes [tubes] for fine *conteries*, usually using five crucibles each.³⁰
- b) Four factories making canes [tubes] for ordinary *conteries*; these are annexes and actually part of the four previous factories. These factories usually operate with five crucibles, increasing to six or seven according to need.
- c) Three factories making crystal and ordinary blown glass. These two types of work, formerly kept separate, are now carried out using the same furnace. Today's factories use [p. 79] three crucibles: two for ordinary glass and one for crystal.³¹
- d) One factory for window glass of all sizes, watch crystals, and French-style bottles. This is the major establishment set up by the Marietti brothers of Milan.³²

In Venice there are three operational factories:

1. Two enamel-bead factories, using a total of ten crucibles.³³
2. One making hollow, colored-glass [tubes] for *rocailles*, with four crucibles.^{34,35} [p. 80]

Although the above report reveals that the number of enamel and *rocaille* (ordinary *conterie*) factories in operation today has decreased, we know that the number of crucibles for producing enamels has increased considerably. As well, since the present crucibles are

Table 1. Annual Production of the Enamel and Rocaille Factories in Venice and Murano.

Quality of the Products	Weight in Kilograms		Value of the Pastes	Cost of Bead Production	Total Value of Manufactured Objects
	Gross	Net, Manufactured			
			<i>Francs</i>	<i>Francs</i>	<i>Francs</i>
1) Enamel pastes for fine <i>rocailles</i>	900,000	750,000	1,500,000	1,000,000	2,500,000
2) Colored-glass pastes for ordinary <i>rocailles</i>	1,400,000	1,200,000	600,000	400,000	1,000,000
3) Enamel and colored-glass pastes for makers of wound beads	<u>350,000</u>	<u>320,000</u>	<u>350,000</u>	<u>650,000</u>	<u>1,000,000</u>
	2,650,000	2,270,000	2,450,000	2,050,000	4,500,000
Enamel cakes and other products	<u>50,000</u>	<u>50,000</u>	<u>200,000</u>	<u>—</u>	<u>200,000</u>
	2,700,000	2,320,000	2,650,000	2,050,000	4,700,000

**Table 2. Summary of the Previous Table.
Products of the Art of the *Margaritaire* and the Wound-Bead Maker.**

Quality of the Products	Net Weight of Products	Value of Products	Total	
			Weight in Kg	Value in Francs
<i>Art of the Margaritaire</i>				
Enamel beads	750,000	2,500,000	} 1,950,000	3,500,000
<i>Rocailles</i>	1,200,000	1,000,000		
<i>Art of the Wound-Bead Maker</i>				
Beads of enamel and colored glass	320,000	1,000,000	<u>320,000</u>	<u>1,000,000</u>
			2,270,000	4,500,000
Enamel cakes and others products	50,000	200,000	<u>50,000</u>	<u>200,000</u>
			2,320,000	4,700,00

larger than in the past, and the manufacturing techniques currently in use more perfected and faster, the output of products is higher than in the past.

To verify this fact, it is enough to note that the art of the *margaritaire*, which existed in Venice and which dealt solely with the production of enamel and colored-glass beads, included, towards the end of the Republic, twenty-two *ferraccia* furnaces, whereas today, [p. 81] when all the *margaritaire* factories now in existence in both Murano and Venice are in full production, they maintain about eighty furnaces, mostly of the tube type.³⁶ It follows from what we have stated that, comparing the old work with the new, particularly as regards enamel articles or fine *conteries*, we can infer that the latter is four times the former; at the same time, it must be noted that the prices of the products have decreased accordingly.

The factories of Murano and Venice create a yearly movement of capital which varies according to commercial transactions, and hence according to an increase or decrease of work. Those in classes a and b above (including the establishments of this type [p. 82] located in Venice) annually produce about 2,320,000 kg of enamel, *jais*, *rocailles*, lamp-wound glass beads, and other objects, for a value of 4,700,000 francs (*see* Tables 1 and 2).³⁷ The other Muranese glassworks mentioned in classes c and d above annually produce about 800,000 kg of crystal, window panes, watch crystals, bottles, and common glassware for a value of 700,000 francs. Most of these products come from the Marietti factory.

Thus, all the factories we have described represent a total annual production of over three million kilograms of diverse manufactured articles, at a value of [p. 83] about 5,400,000 francs.

From these facts we can calculate that the total approximate commercial activity of the city of Venice, within this sector of industry, including the import of raw materials used in the glassworks and the export of the resulting products, exceeds an annual amount of about eight million francs.

CONCLUSION

As an accomplished local glassmaker, Bussolin provides insight into the Venetian beadmaking

industry that is not to be found in many other works. Of some 30 known reports prepared on this topic during the 19th and early 20th centuries, only six others (Anonymous 1835; Carroll 1917; Hoppe and Hornschuch 1818; J.P.B. 1856; Zanetti 1866; Zanetti and Sanfermo 1874) are clearly based on personal observation. Even so, the observers (with the notable exception of Zanetti who was a local historian) were generally just curious travelers who were given the grand tour so some details of their accounts are occasionally suspect. The other accounts do not acknowledge their sources, but several are definitely based on earlier works (e.g., Anonymous 1825; Benjamin 1882; Lardner 1832). In fact, a practically verbatim though restructured version of Bussolin's text appears as a chapter in *Venise: l'Art de la Verrerie* by Pieter D'Hondt (1891: 35-49). The latter is an excellent example of why researchers must be careful when collecting material regarding the chronology of beadmaking technology and other aspects of the industry; the date of publication -- especially of an encyclopaedia -- does not always correspond with the date of observation.

ENDNOTES

1. Workers practicing this art are known as *perlai* (*perlaires*).
2. There are now four factories producing enamels on the island of Murano: Pierre Bigaglia q.^m L.; A. Dalmistro and Co.; the heirs of J.B. Santi; and the Coen Brothers. The first of these factories, owned by P. Bigaglia, is one of the largest and most worthy of observation, as well as the easiest for foreign gentlemen to visit. It is located at the entrance to the island on leaving Venice. Two factories in Venice are also involved in this production: L. Zecchin in San Leonardo and Edme Voizot in San Jerome.
3. Usually, these tubes are pulled out over a distance of about 150 *pieds* [160 ft., or 49 m]. In the past, as well as rounded tubes, triangular and quadrangular tubes were also produced, as were tubes with solid and differently colored stripes.
4. Of the principal *perlaire* workshops in Venice, we will mention two: Ange Giacomuzzi's in the San Marzialo parish, where gold mosaics are pro-

- duced, and I.B. Franchini's in the San Alviso parish, which is known for its enamel work called *millefiore*.
5. Instead of melted tallow, which is usually used as fuel, the author of this book obtained a patent in 1843 for the use of carbureted hydrogen gas. Tests carried out on this type of process guarantee good results. Indeed, the gas flame causes the enamels to develop brighter, more pleasing colors, especially those colored red with gold oxide. As well, because of the intensity and uniformity of the flame, the product is larger and allows considerable cost savings. In spite of these proven advantages, industry always hesitates to adopt a new process when the usual routines or local customs are ignored. At first there are many impediments and obstacles, and thus wound-bead work continues according to the old method described. [It is interesting to note that the beadmakers were forced into using the new fuel following the siege of Venice in 1849, when the city was not only without oil, but without meat and, consequently, tallow as well (Gasparetto 1958: 195).]
 6. The Armenian Mechitarist Fathers on Venice's San Lazzaro Island have a mummy whose long apron (*tablier*) is woven of variously shaped beads of varying colors which appear to be made of glass, and which were, in fact, considered to be glass; upon examination, the author recognized them as being clay coated with colored glass. The designs represent Egyptian hieroglyphs. [What Bussolin discusses here is actually faience, a fused mixture of finely crushed quartz and an alkali, such as natron, that is usually covered with a blue or green glaze. Glazed pottery was unknown to the ancient Egyptians.]
 7. Unpublished memoir on Murano Island by Counsellor [Carlo] Neijmann Rizzi; and a memoir on the glasshouses of Venice by Counsellor Rossi, read to the Athenaeum of Venice in 1841. [Rizzi's assertions that Marco Polo was responsible for setting the Venetian bead industry in motion and that Briani and Miotto were the first producers have no basis in historical fact (Gasparetto 1958: 182-183)].
 8. Memoirs by Neijmann and Rossi.
 9. Marin, *Histoire civile et politique du Commerce des vénitiens*, vol. IV, book II, page 172, Venice, 1800.
 10. One of the main ancient trade routes leading to the Asian interior and the Indies was the following. From the Black Sea the merchandise went up the Fasi River (now known as the Rion). It was then transported by wagon about 15 leagues [ca. 38 mi., or 60 km] from Serapana to Sura [in central Georgia], where it was shipped downstream on the Cyrus River (today known as the Kura) to the Caspian Sea. It finally reached the Oxus (today known as Gihon or Amu) from where it was distributed throughout Asia. *Mémoire hystorique et géographique sur les pays entre la Caspie, et la mer Noire*, Magasin de Paris, October, 1797; and Marin, *Histoire civile et politique*, etc., vol. IV, book II, page 132.
 11. "It would be impossible to say what quantity of glass [objects] the Venetians exported to Syria, Egypt, Barbary, and the Black Sea, or of the *Margaritines* which were in demand throughout the East to adorn women, dwellings and clothing." *Ricerche Storico-Critiche sulla Laguna Veneta, e sul Commercio dei Veneziani*, Venice, 1803, p. 189.
[George] Macartney tells us that the Mandarin Chinese and the Tartars wore Venetian glass buttons on their clothing, as well as ornaments made of *Margaritines*, as symbols of their dignity and their profession. He adds that this is a remnant of the nearly exclusive ancient trade practiced by the Venetians with China. *Voyages à la Chine*, and *Ricerche Storico-Critiche*, etc., p. 140. [Peter Francis, Jr., (1990: pers. comm.) believes that the beads mentioned by Macartney may well have been of Chinese manufacture.]
 12. In the work quoted -- *Ricerche Storico-Critiche sulla Laguna Veneta, e sul Commercio dei Veneziani* -- 1803, p. 140: "That in Duhalac near Masuah on the Red Sea even now the currency in use is Venetian beads, or *margarites*, or those enamel tubes or small balls of various colors that are made in Venice, and that are very popular in the Orient as ornaments, decoration, etc. Whether new or old, broken or whole, whatever the color or size, all are in use as currency."

13. D'Artaud, *Vie du Pape Pie VII*.
14. These guilds lasted until 1806.
15. Book II, chapter IV, p. 258, Venice, 1798.
16. It was given this title because, among its other duties, it monitored the dispensation of the different sorts of work carried out in each glasshouse.
17. "*Si fa pubblicamente intendere e sapere, che le contraffazioni di qualunque genere di lavori nelle fabbriche vetrarie di Murano, si sospenderanno irremissibilmente, previo trasporto delle manifat-ture spurie: si procederà criminalmente contro i rei contumaci, e si aprirà un processo segreto d'inquisizione sempre permanente, per indi dis-cendere contro li medesimi inesorabilmente alli piu severi castighi, a riparo di tanti pubblici e privati pregiudizii.*"
18. Report of the College of Five Sages to the Senate on January 30, 1762 MV (1763). See the Capitulary containing documents and decrees relating to the art of glassmaking, preserved in our public archives.
19. See the resolutions adopted in the *Maggior Consiglio*.
20. On lit: "*Che i capi del Consiglio de'X, dovessero avere la cura dell'arte, valendosi anche di vie le piu segrete e severe, quali pareranno alla loro prudenza, nell'invigilare attentamente, e prov-vedere, che niuna persona impiegata nelle arti vetrarie partisse da questo stato, per trasportarle in alieni paesi.*"
21. "*Che il governo delle arti vetrarie, in via amministrativa, dovesse spettare all' Eccelso Senato.*"
22. Ab. Fanello, *Saggio storico di Murano*, p. 29.
23. *Idem*, p. 30.
24. *Idem*, p. 30.
25. The "Golden Book," with parchment pages, is still preserved in the Murano chancellery. In his new "Voyage to Italy," Misson reports that "the glass-makers of Murano refer to themselves as gentlemen, having been ennobled by Henry III who watched their work while in Venice (1753); and they enjoy the rights of the bourgeoisie (*citadinance*); vol. I, p. 326, printed in the Hague, 1727.
26. Vettor Sandi, *Storia civile della Repubblica di Venezia*, part I, vol. II, p. 548, Venice, 1755.
27. A *Bezzo* was a coin worth half a Venetian sou, or one and one-half centimes of an Austrian pound.
28. This provision was also confirmed by Senate De-cree on September 5, 1776.
29. On page 4 we reported that Mr. Barbaria had received permission to build a glasshouse in Venice in 1790 to manufacture bottles in the Eng-lish style; since Mr. Barbaria was Venetian and did not belong to the glass manufacturers' guild of Murano, it was through a special favor and an order from the State Inquisitors that he was granted Muranese citizenship and the right for himself and his descendants to be registered in the "Golden Book" of Murano. Otherwise he could not have practiced the art in question. This can be confirmed in the "Golden Book" of Murano under the date of April 15, 1793: "*Per comando degli Illustriss. Inquisitori di Stato, aggregato Zorzi Barbaria coi suoi legittimi discendenti. Esente dall' Ufficio del Comparto per la sola fornace ad uso di bottiglie d' Inghilterra eretta nella domi-nante.*"
30. See endnote no. 2.
31. See endnote no. 2.
32. This factory is an annex of one of the two pre-viously mentioned: L. Zecchin's in San Leonardo.
33. In the glasshouses on Murano, filigree glass and ribbon glass are worked in the old style according to the method reproduced by the author. In Venice, Mr. Pierre Bigaglia built a factory to make these products which stands out from the rest because of the beauty of the products. His factory also produces jasperated and spotted glass in imitation of various types of marble.
While the filigree work we have referred to now competes with that being produced in French factories for the past two years and in a few places in Bohemia, the Venetian product is remarkable for a specific genre of work which sets it apart from that of foreign factories. As well, as of 1838, Venice was the first to give a new radiance to this branch of the industry.
34. In Article IV, we showed the difference between *ferraccia* and "tube" furnaces. All told, there are

ten *margaritaire* factories, five of which are annexes of enamel factories in Venice and Murano. The other five are separate.

35. This output is calculated on the basis of the average number of crucibles maintained in the enamel and *rocaille* factories of Venice and Murano, taken together, for the following total: 30 crucibles for enamel and fine *rocailles*, and 24 crucibles for ordinary *rocailles*.

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