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A IMPORTÂNCIA DAS CONTAS LONGAS DE VIDRO DE ORIGEM MEDITERRÂNICA RECOLHIDAS NA "BAIXA POMBALINA" DE LISBOA

CONTRIBUIÇÃO PARA O ESTUDO DE CONTAS TIPO "NUEVA CADIZ"

The importance of the long glass beads of mediterranean origin collected in the "Baixa Pombalina", Lisbon

Contribution to the study of the "Nueva Cadiz" type beads

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RESUMO: Pretendemos com este trabalho dar a nossa contribuição para o estudo das contas de vidro e introduzir novos dados e valores no estudo do comércio entre Portugal e o mundo africano, nomeadamente com a costa Ocidental da África , onde a permuta de pessoas, bens e ideias foi em parte determinante. Estes contactos permitiram alargar os horizontes socio-culturais entre diferentes povos e simultaneamente entre dois continentes para onde as contas de vidro foram levadas, permutadas e usadas. As contas documentam a vivência social de quem as usa, sendo a expansão ultramarina, a principal responsável por todo este intercâmbio, tendo o Tejo como ponto de partida para o que foi uma das maiores aventuras do "Homem", dando simultaneamente início a uma das grandes épocas da expansão socio-cultural no mundo, que viria a modificar o modo de viver e sentir.

Palavras chave: Baixa Pombalina. Lisboa. Contas de vidro. Nueva Cadiz. Escravos.

ABSTRACT: With this work we aim to contribute to the study of the introduction of new methods and values in the trade between Portugal and African countries, specially with the West coast of Africa. This trade allowed an exchange of goods, ideas and people which widened the social and cultural horizons between two people and simultaneously between two continents, where glass beads were taken, exchanged and used.

Key words: Baixa Pombalina. Lisbon. Glass Beads. Nueva Cadiz. Slaves.

1. Introduction

The study of these glass beads follows a previous work carried out by the author on a set of beads from Luanda, which was another contribution to the study of glass beads and was presented in the *I Mediterranean Congress of Historical Ethnology* and published on the 3rd volume of the Actas, in 1993, by the "Universidade Nova de Lisboa" in the "Mediterrâneo" Magazine.

The set of beads that are presented in this paper were collected during the 1990's and came from the works carried out by an intervention team in the "Baixa Pombalina", Lisbon, during the construction of a new underground station as well as part of the network tunnels, to safeguard the city's heritage.

The beads collected by the team assigned to the D. Pedro IV Square –"Rossio"– were referenced as Set I while Set II gathered the beads

collected by the Lisbon Roman Theatre Team, assigned to the "Termas dos Cássios".

The study aims to cast light on the glass beads topic, which in Portugal is unfortunately scarcely researched, since they were of major importance in the Afro-Portuguese trade, which had Lisbon as the ignition. The city was an important trading centre and also the place from men sailed to give the world knowledge of itself, carrying with them hope to a better life, when they returned to their homeland. Thus broadening the socio-cultural horizons to India, Timor, China and Japan. People of different religions came across each other; traditions and values criss-crossed; great joys and nostalgia were felt. For centuries all of them left a little of that past behind, which is being re-written by the archaeologists through a careful and methodological research.

Lisbon was indeed a bead-trading centre, since a bead warehouse in S.Paulo (near the right bank of the river Tagus) was referred in a date prior to the 1755 earthquake. On the other hand between 1500 and 1600 were mainly the Portuguese, who took by sea glass beads to trade in Africa. We will try to understand how these beautiful and rare beads fit in the Lisbon socio-cultural life. We are also going to trace the beads chronology, focusing on the reasons why they came to be found in the present "Baixa Pombalina". Through its technological and mineralogical study we hope to have found a connection between these materials and the great glassmakers, who manufactured beads in the Mediterranean, namely those produced in Venice since the XI century.

A number of 16 specimens were collected in areas/layers/levels considered "pré-Pombalino" (prior to the 1755 earthquake) based upon the layers layout study and they seem according to the colour and morphology similar to the beads from Luanda, which were used as elements of prestige and social status as well as valuable trade items, but they had also a magical value.

2. Historical background

Beads were certainly the most ancient piece of adornment used by man to differentiate himself from his companions, with magical purposes and yet as a trade item. The beads seemed accessible and easy to get, which allowed its spread across the whole world, not only adorning people but also used in burials, whether simple or sumptuous. Beads mirrored also the hierarchy of the society, since they showed the social status of the person who wore them, whether man or woman. Regarding women, beauty was enhanced by the beads worn, which lead obviously to an increment in production as well as variety.

Glass as raw material was largely used since the Egyptians (even before Narmer) as the remarkable quality of the manufactured pieces show.

History itself made an enormous contribution to the comprehension of Venice both as the glass manufacture-leading centre and as the glass trade-leading centre. Venice manufacturers lead the market in volume, quality and diversity until the XX century. The Lombardians founded Venice in 568 A.D., but the beginning of the glass manufacture is not straight forward, but the discoveries of glass containers fragments, mosaic tiles and the kilns in Torcelo Island puts it between 600 and 650 A.D.. Glass beads according to several scholars appeared only around the XI century.

Manufacturers in the end of the XIII century (1292) were located in Murano, since the glass manufacture units were transferred there, due to the danger of catching fire. The kilns were high temperature furnaces and at that time fires were a feared danger because of the frail constructions and scarce means to put them out.

The glass manufacture technique was then a secret and a heavily guarded one; the manufacturers were forbidden to reveal or teach the methods under the death penalty. This situation was only changed when new technologies were developed. As we said, historical events play a major role in the development of the glass manufacture technology. After the destruction, by the Mongolian leaders in 1401, of all the glass manufacture centres in western Asia (cities like Damascus, Aleppo and Sidon), many glassmakers came to Venice. In 1453 with the conquest of Constantinople (today Istanbul) by the

FIG. 1. *Map with the location of the main cities of Western Asia, where the glass manufacture technology achieved a great prestige.*

Turkish Ottomans and the plunder of Tyro, a new flux of glassmakers flooded the Italian cities as Venice and Florence, which became cultural centres irradiating culture, knowledge and new ideas, leading Europe into the Renaissance Period.

The glass beads manufacture technology was slow and patient, but it became gradually faster and the production could be increased and the quality improved. The glassmakers returned to Venice (1592), since the manufacture was no longer dangerous (the furnaces worked with cooler temperatures and different technologies were used) and an industrial organisation was not needed. Therefore in the beginnings of the XVII century (1606), Venice had already twenty-five production sites and the secrecy of the methods was no longer required. Incidentally, the production rate of twenty two Venetian manufactures, in 1764, was about 18 thousand kilograms per week, all due to the innovation and the technology used to manufacture glass.

The glass beads produced were based on the lamp-wound technology, which was in use since the end of the XVI century. The methods were improved and the production increased (around 1610's), allowing the creation of a greater variety of designs.

3. Glass manufacture technology-its importance

Glass/Raw material

The beads final shape depended upon the manufacture technology, which allows us to trace down the beads origin and even tell the manufacture date with some accuracy.

The beads studied are of two types: "drawn beads" and "chevron beads". The former type set, with 14 beads, have monochrome surfaces and replaced the "wound beads" method, L.S Dubin (*History of Beads*, 1987).

The "drawn beads" specimens in general, are all tubular with cylindrical central drilling as well, but with two possible cross-sections: circular or prismatic with flat or twisted faces (these two types are also seen in the studied beads). They were obtained from a tube, which was cut in different sizes and from different diameters came different beads. As an ultimate process the beads could also be improved/finished; they were then re-heated or polished to smooth the edges, achieving different shapes. Standard beads could also be produced, increasing their popularity. The studied beads present a certain twist, which results from the technology used in the final phase (stretching or drawing).

The "chevron beads" feature different surface colours. These beads are made of several layers of moulded and drawn vitreous paste of different colours, which are divided and finished by hand through a re-heating process. Unlike the "drawn beads" they came in different shapes and forms. The Venetian glassmakers reinvented this ancient manufacturing process, around 1500, which centuries after made the beautiful "chevron beads" one of the most popular. In the XVII century the Dutch began to manufacture these beads as well as the Bohemians and the Moravians, after the Venetian glassmakers had escaped from the tight control they had been under and the glass manufacture technology was consequently no longer a secret. Little is known about the production of "chevron beads" in Venice in the beginnings of the XVIII century. An explanation points towards the reduction of the manufactured beads on the opposite of what would happen in the next century.

The Colour

Apart from stylistic variations, the colour is one of the most important features in beads. Adding metal oxides to the glass paste confers colour, for instance copper or cobalt gives blue colour. Therefore the raw material analysis is crucial to determine which oxides could have been used, tracing down the manufacture method and then the most likely place of manufacture.

In the XVII century blue was the most common while orange and pearl were the least used. However green and yellow took the lead even before the end of that century. During the XVIII century and until the XIX century green and greenish blue became the widest known colours.

The beads composed of several coloured layers manufactured in several places other than Venice must also be pointed out. These new locations increased their manufacture around the XVII century after the publication of a book about the glass and glass beads manufacture technology and technique in Venice.

Bead Manufacture Spread and Trade

On the XVIII century, glass manufacture was improved and large-scale production was then possible, leading to a larger variety in bead styles and easier outflow of technical knowledge as well as an expansion of the trade with Africa and the New World. Explorers and traders were doing the transport from Lisbon and Cadiz since the XV century, Dubin (1987), according to the routes shown in the map (Fig.2).

In Amsterdam however, Venetians and Murano glassmakers seem to have been already manufacturing beads. Field works carried out in ancient parts of the city yielded proofs of beads manufacture dated about the XVI century. Evidences of bead manufacture in Venice and Murano in the end of 1500, which supplied the African and American trades first and the East afterwards, confirm the scenario.

The growing European interest on Africa and the trade development in particular, lead to the creation of new shapes and types of beads. Therefore, if the beads were to "purchase" slaves, they had a special shape; size and colour as well as those used in the ivory, gold or palm oil trades. Each type could be considered as a standard money in each trade, as L.S. Dubin (1987: 108-109) and other authors referred and is also shown in Museums as the Pitt Rivers Museum in Oxford.

Identical situation is also found in the New World, where the Spanish took the beads around

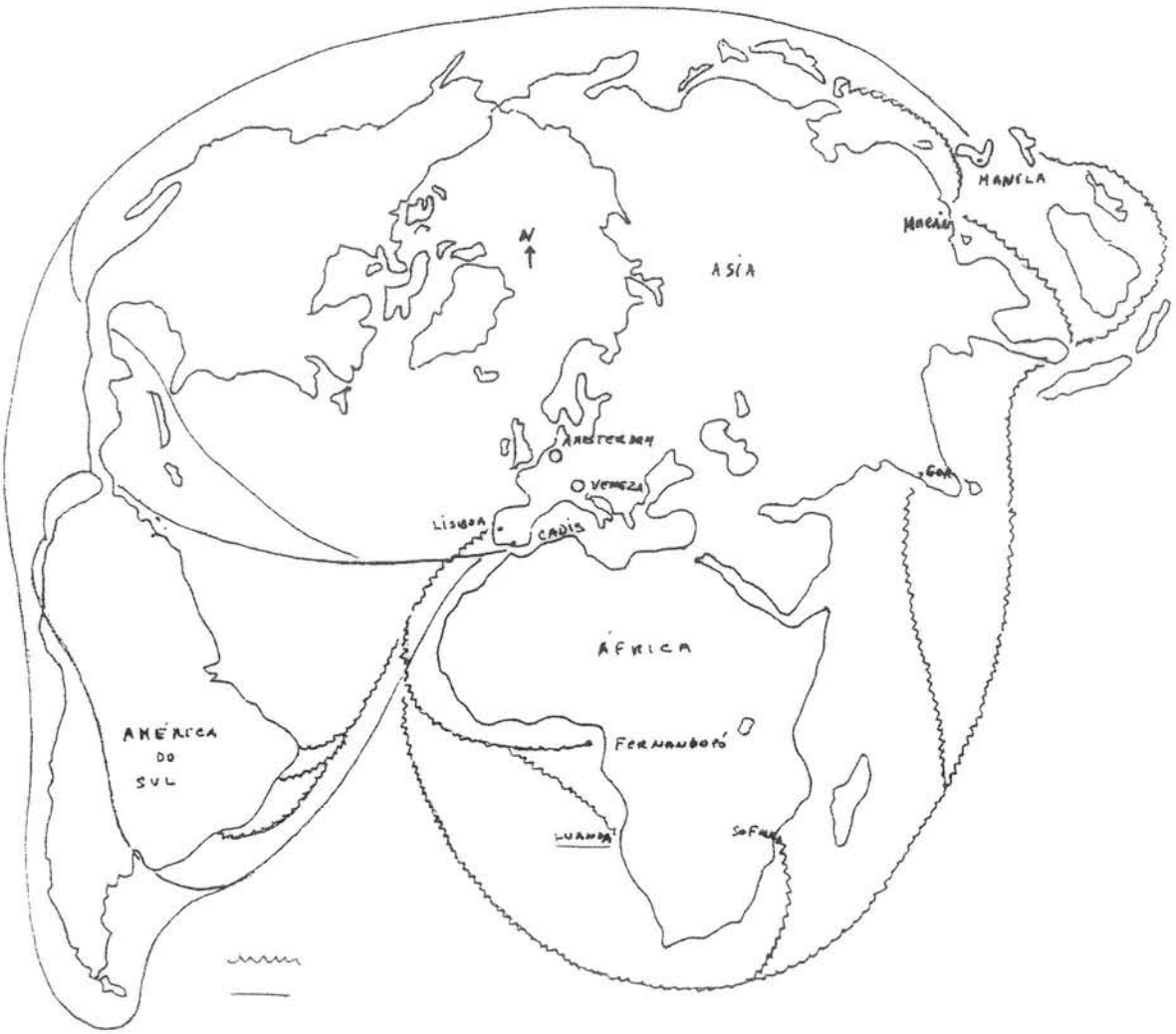


FIG. 2. *The glass beads trading routes of the Lisbon and Cadiz , from 1500 to 1600.*

the end of the XV century. Only certain types of beads were found in the countries ruled by the Spanish crown as the "Nueva Cadiz" beads, for instance. This type of beads was only collected in Venezuela and Peru; in sites dated back to the middle of the XVI century and they are absent from sites dated back to the second half of the same century. Scarce information about the manufacture centre or where the beads came from is available. Some scholars argue that they were manufactured in the south of Spain due to the great trading traditions dating back to the Phoenicians; or in Catalonia, northern Spain, where East Mediterranean glass manufacturers worked.

The study of the beads collected in the "Baixa Pombalina" of Lisbon is undoubtedly going to play, as all the other studied materials, a major role in the history of beads.

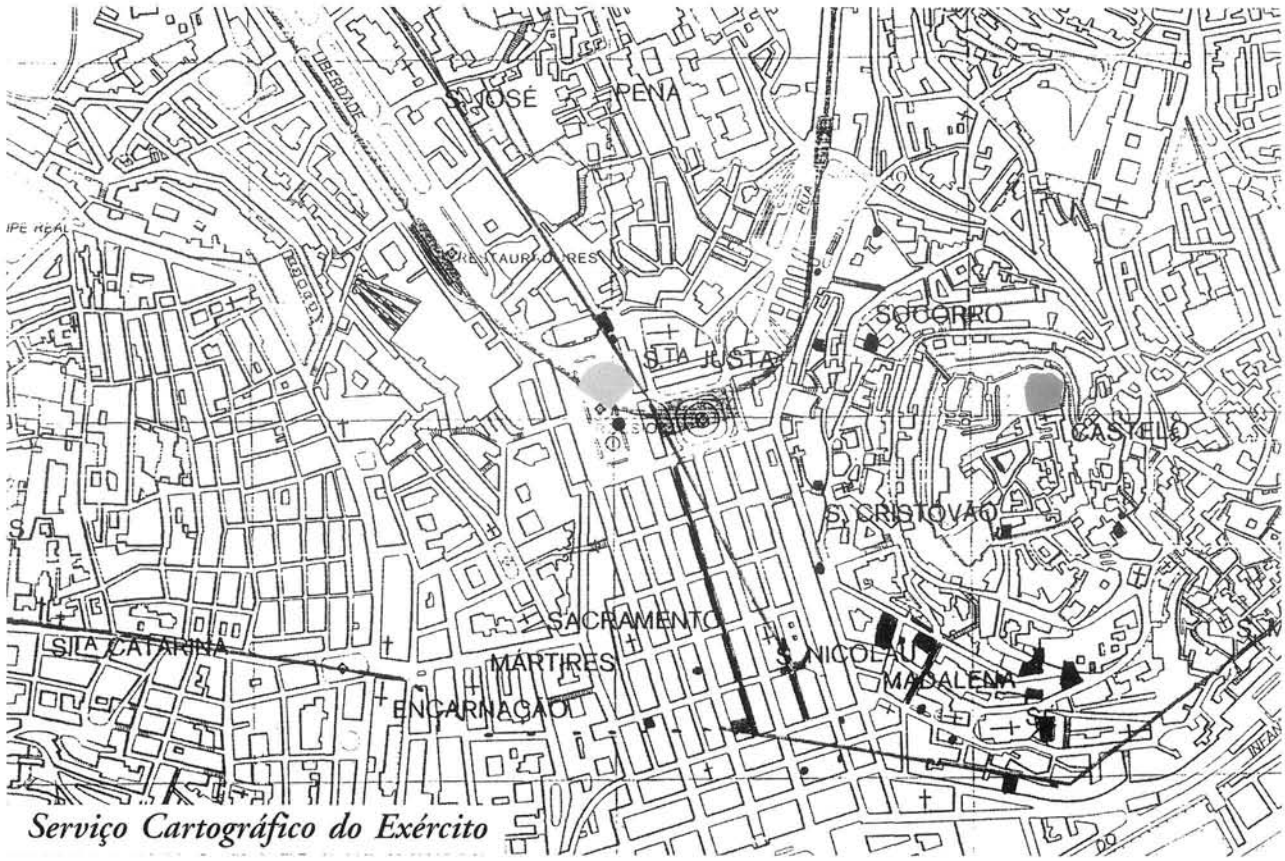


FIG. 3. *Detail of the map of Lisbon with the location of the Archaeological Intervention area in Praça de D. Pedro IV (Rossio) - Set I (MRS -94).*

4. The archaeological finds

The Portuguese Culture Ministry, the Lisbon Underground Administration and those responsible for the construction of the new underground stations and the City Council as well decided to carry out archaeological intervention works in the area of the "Baixa Pombalina".

A number of 10 glass beads were collected, among other data, in the "Praça D. Pedro IV" (usually known as "Rossio") (Fig. 3) and were referenced as **Set I - (MRS - 94)**[1].

In the area designated as "Terma dos Cássios", namely in "Rua das Pedras Negras" (RPN) and the "Garden of the Palácio Penafiel" (PPJ) situated in the "Rua de S. Mamede ao Caldas" (Fig. 4), 6 beads were collected and referenced as **Set II - (RPN) and (PPJ)**[2].

Fieldwork methodology

Set I (MRS -94)

The fieldwork was severely restrained due to the fact that the team of archaeologists had to work behind the drilling machine, which had its own velocity and made the task to determine the layers layout as well as what each layer yielded, very difficult. In virtue of the urgency of the construction works, the layers were not classified

[1] The archaeologists responsible for the fieldwork were Dr. Clementino Amaro and Dr. Ana Vale.

[2] The archaeologists responsible for the fieldwork were Dr. A. Dias Diogo and Dr. Laura Trindade.

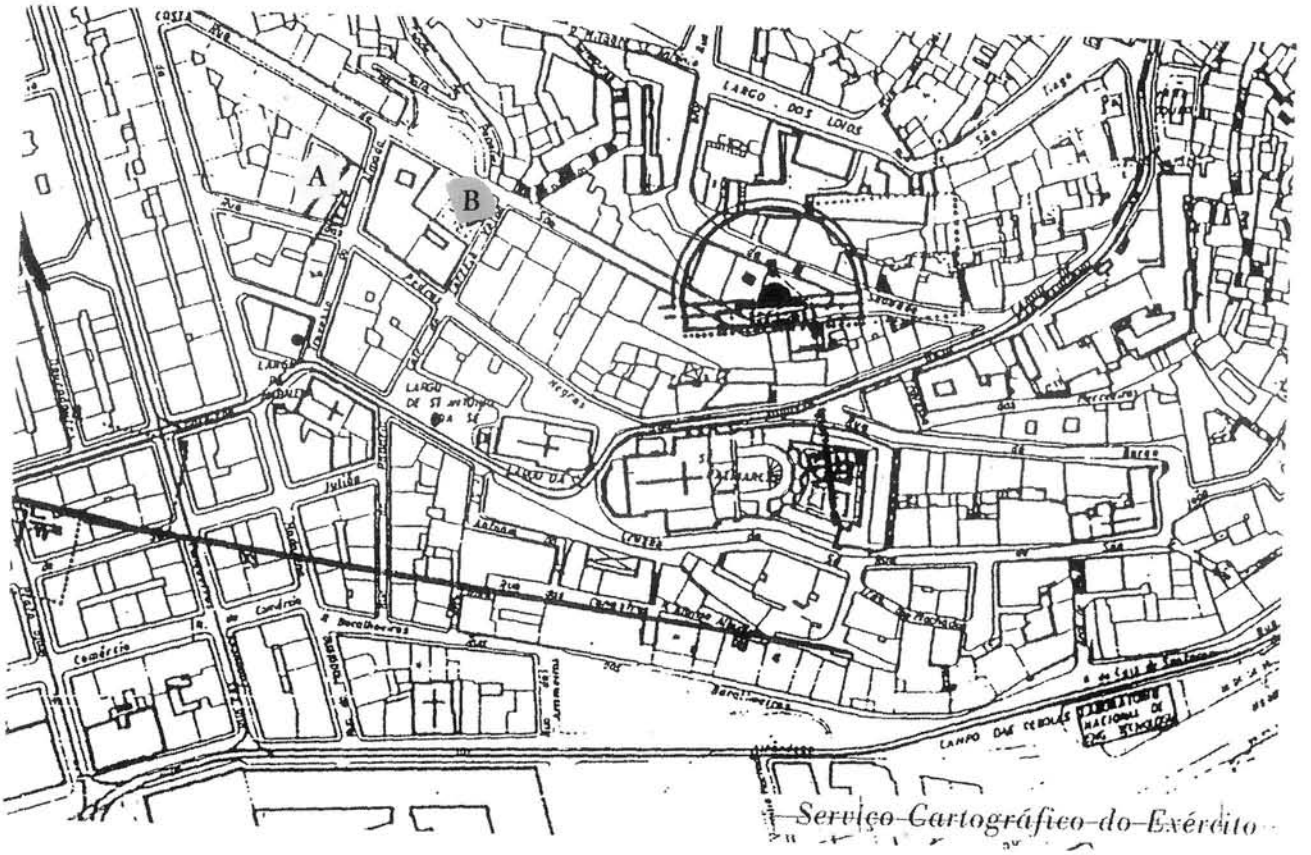


FIG. 4. *Detail of the map of Lisbon with the location of the Archaeological Intervention areas in Rua da Pedras Negras (A) and in the Palácio de Penafiel (Garden) (B) - Set II (RPN) and (PPJ).*

in the usual way. Although the waste material was very thick, it was artificially divided in several unit layers according to the colour and texture of the sediments; and then the found materials were registered (all this description is based on the method used by the fieldwork co-ordinator Archaeologist Dr. Ana Vale). Hence the materials were only registered according to the unit layer where they were collected; several layers were then defined from the surface downwards. Thus 0 is assigned to the base of the statue (there is a statue of King D. Pedro IV in the "Praça D. Pedro IV / Rossio"), as shown in the map (Fig. 5).

Schematic Structure of the layers considered

1st layer: the pavement of the actual street; **2nd layer**: 50 cm thick light brown dirt, 5 beads (n.º 73 to n.º 77) were separately collected in the bottom of the layer. These beads were among the remains of a forge, documented by shards of white glazed pottery and other kind of pottery, both with blue decoration; some of the vessels were still intact. Some coins of the reign of D. João V period were also collected, from which a small golden coin stands out, and others already from the reign of D. José I period; **3rd layer**: yellow mortar, broken in some areas. Two more beads were collected (n.º 81 and n.º 82) and a shard of domestic pottery as well; **4th layer**: with 40 cm thick and with remains of the forge's structure (Fig. 6 a) within an area of 14 m^2, which defined a compartment referenced as 3 (Fig 6 b), where two other beads were collected (n.º 79 and n.º 80). Remains of an ash and compacted iron smelting slag layer yielded a great number of medium size crucible (about 40); **5th**

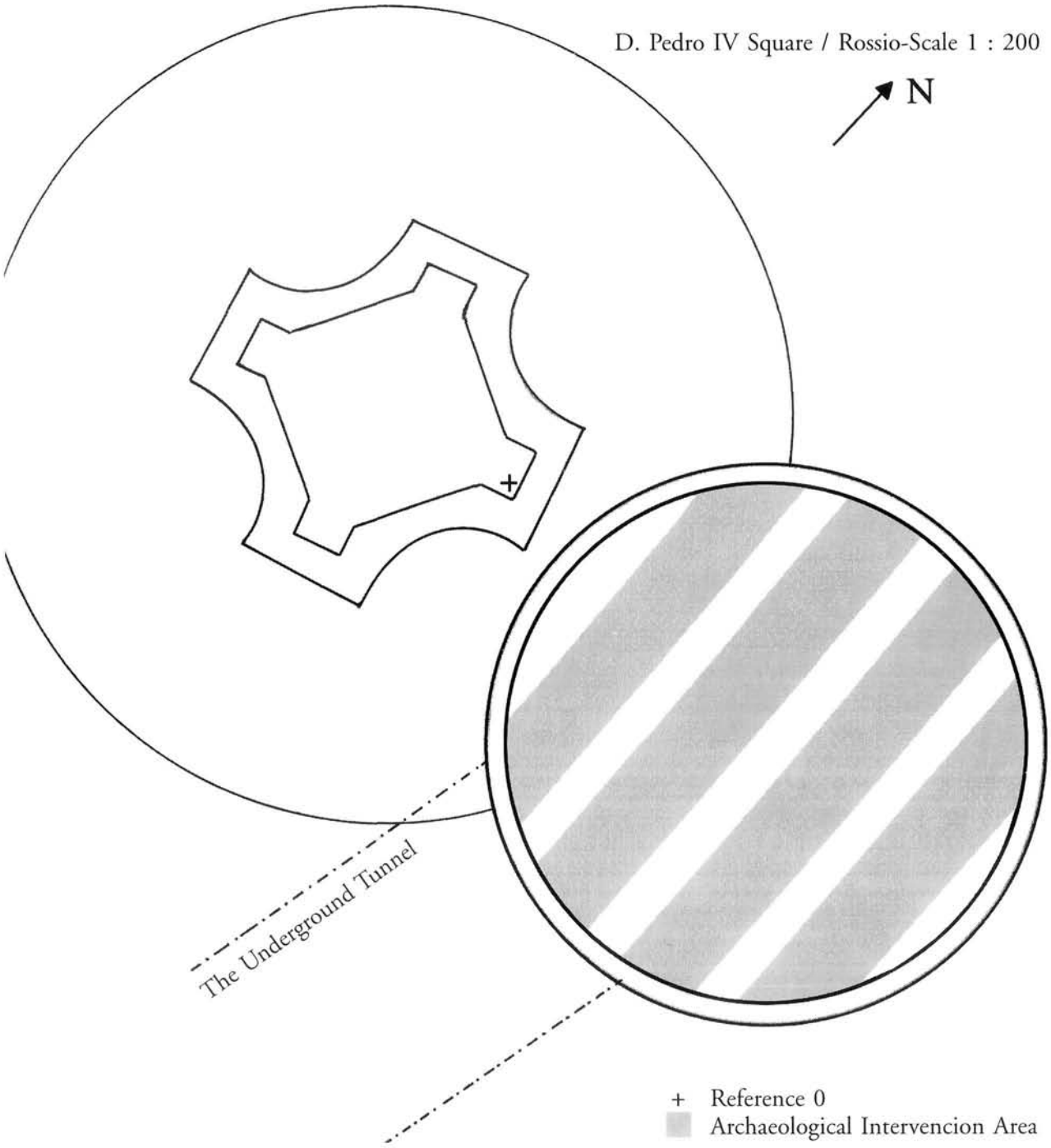


FIG. 5. *Map of the entire Archaeological Intervention area in the Praça de D. Pedro IV (Rossio).*

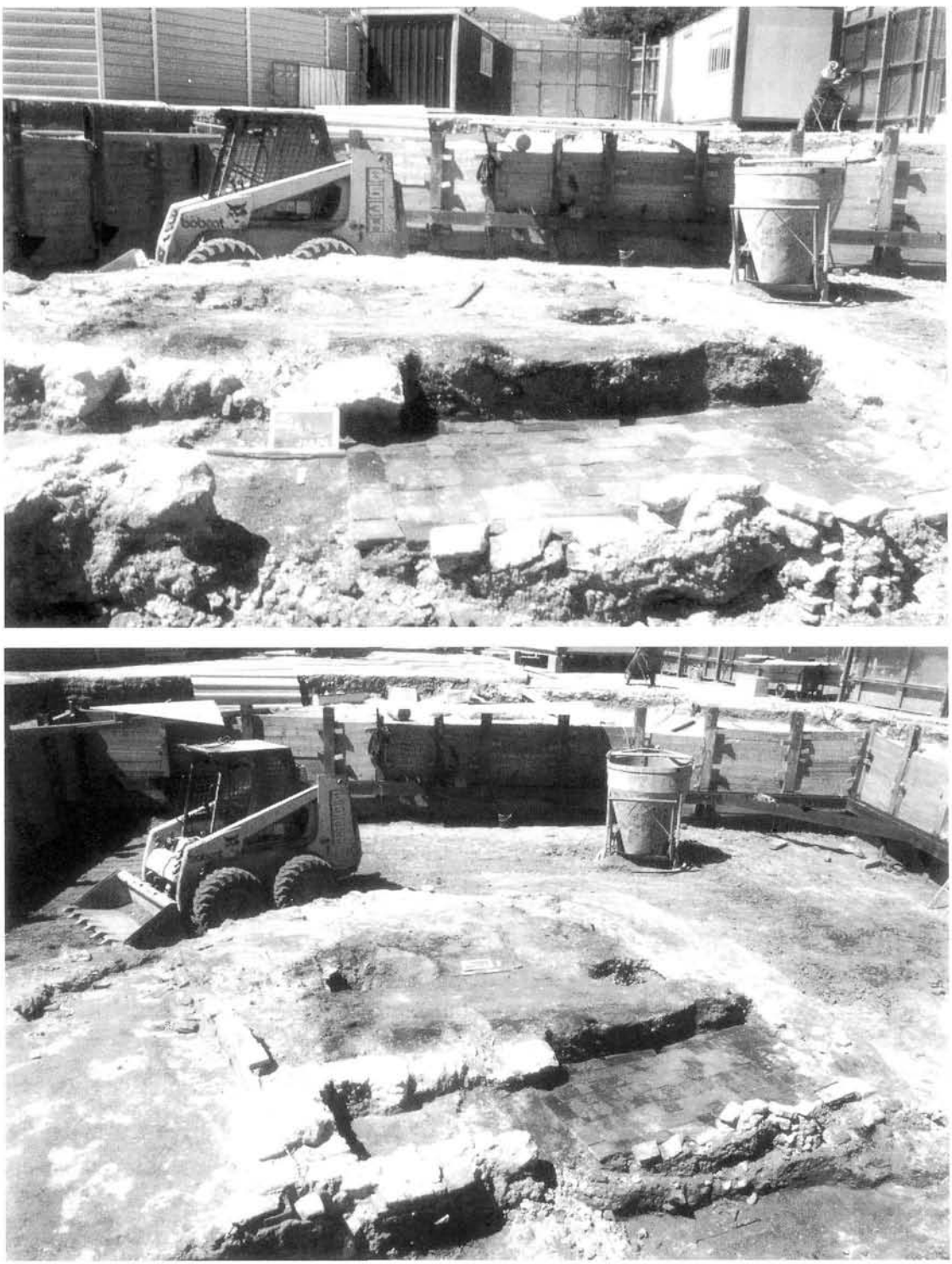


FIG. 6. *Set I - Aspects of the fieldwork:*

a) The forge
b) The compartment n.º 3.

a)

b)

FIG. 7. *Set II - Aspects of the fieldwork:*

a) Detail of the well area in the Rua das Pedras Negras.
b) Detail of the excavations - Garden of the Palácio de Penafiel.

layer: "Pré-Pombalino" (prior to the earthquake) waste material. From here on, another bead (n.º 78) was collected between the **20th** and the **25th layer**, about 4,5 m from the surface. It was a sandy dirt area, which yielded red clay vitreous-texture domestic pottery and 3 shards of white-glazed domestic pottery with blue motives. After the **30th layer** (5,5 m from the surface) the archaeological material was absent and only reappeared around 6,5 m deep as well as structures from the Roman period.

Set II (RPN) and (PPJ)

This area of the "Baixa Pombalina" named "Terma dos Cássios" was of great interest and significance to the intervention team. The strata unity was the layer and the number 0 was assigned to the pavement. However occupation levels must have been defined and considered within the excavation, with 5 m square grids (according to the fieldwork co-ordinator Archaeologist Dr.Laura Trindade).

Schematic structure of the levels considered in the-RPN

1st level –floor of a building; **2nd** and **3rd levels**– waste material, well defined remains of the 1755 earthquake; **4th level** –defined from under the floor, prior to the earthquake, until remains, which can be considered as a result of the works carried out in Lisbon, during the reign of D. João V (in the second forth of the XVIII century). It yielded specimens n.º 1 to n.º 4. Bead n.º 1-was collected from a wet place; waste material with water (a well) (Q central -9th layer– inventory n.º 6001); Bead n.º 2-was collected at the level of the brick pavement (Sond. N 2 - 10th layer - inventory n.º 2884); Bead n.º 3- comes from the same context as the latter and was collected under the pavement of the "Pré-Pombalina" city (Q3 - layer 5R - inventory n.º 44903); Bead n.º 4 was collected among sandy greyish dirt in the upper layer of the destroyed city level (by the 1755 earthquake) (Sond.6-5th layer -inventory n.º 44904). Bead n.º 5-came from an area of waste material, which resulted from the destruction caused by the earthquake and was collected from the well's interior (also from the earthquake level) - (Q central - 7th layer -a well -inventory n.º 6000).The following levels documented earlier periods, which did not yield any beads: **5th level** - Medieval Lisbon layers; **6th level**- Islamic city: documented by pottery; **7th level** - Remains of the Roman occupation; **8th level** -Geological layer with consolidated clay.

Palácio Penafiel (Garden)-PPJ

From the intervention in the "Garden of the Palácio Penafiel" (PPJ) a unique glass Bead n.º 6 (Q3 - 9th layer - inventory n.º 12889), was collected among other archaeological remains in levels characterised by waste material from the earthquake level.

5. Analysis and beads characterization

Beads of the Set I (MRS-94)

In this intervention 10 elongated/cane glass beads were collected, all made of opaque blue glass (Fig. 8) and from different layers of the archaeological works, as mentioned before. The beads are of two types, though both were obtained through the "drawn beads" method: straight or twisted prismatic faced, cylindrical central drilling and they are a composite of several layers of blue and white paste (Fig. 9 a). Bead n.º 75 is however an exception; although it was obtained through the same method, another manufacture is documented as well as a different morphology: both the body and the central drilling are cylindrical, but the body is made of only one layer of paste. Whence the bead came from a set of a homogeneous colour paste (Fig. 10).

Beads of the Set II (RPN)

This intervention on the other hand, yielded 5 elongated/cane glass beads. All of them came

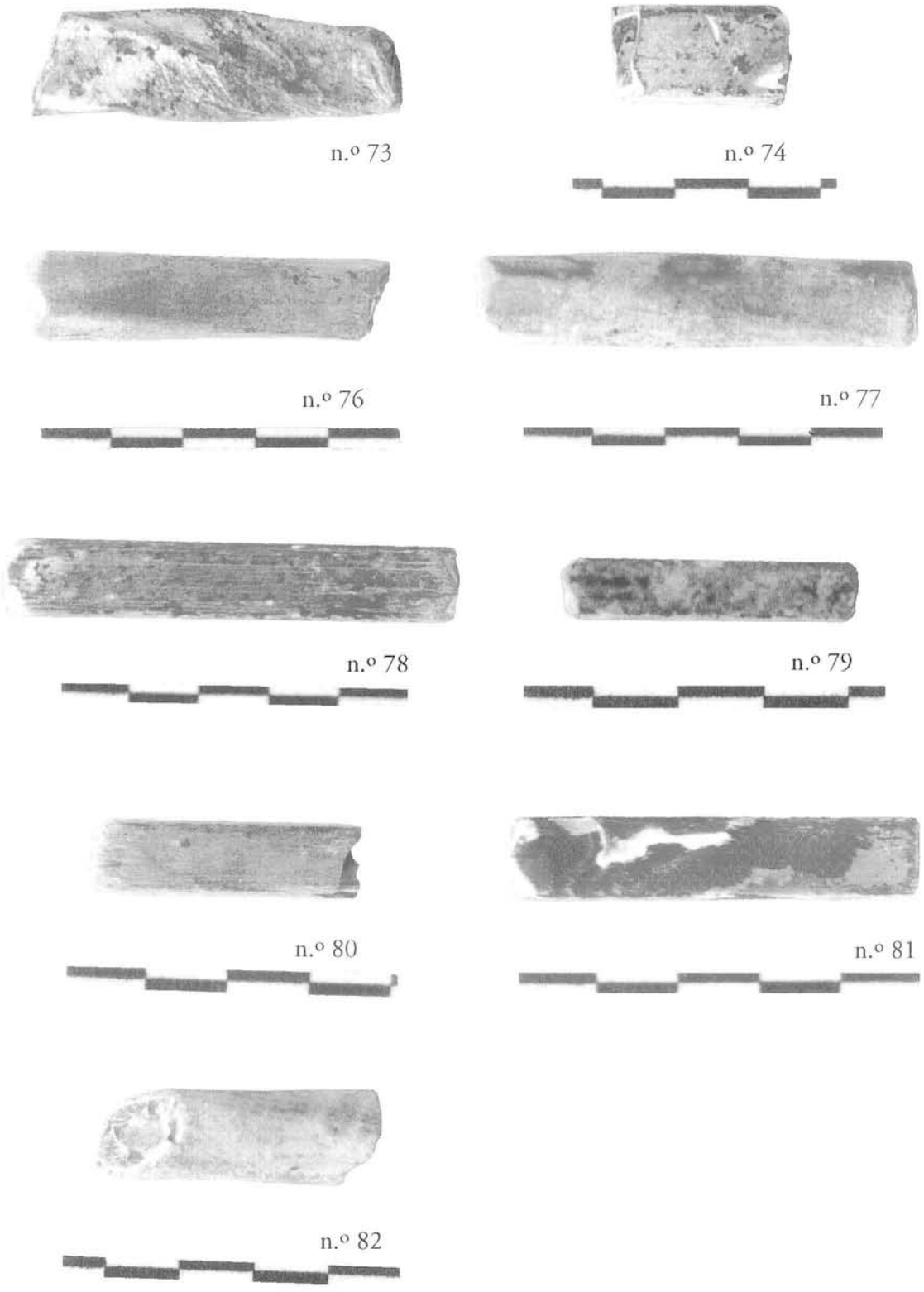
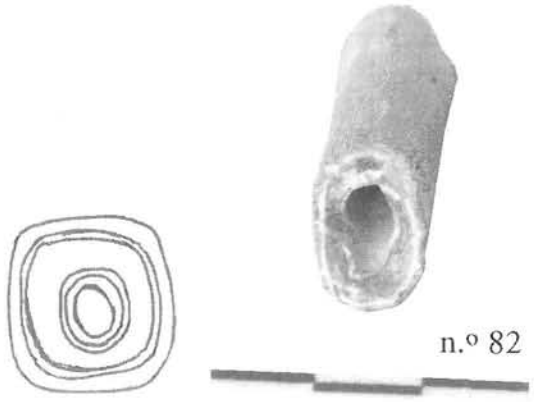


FIG. 8. *The glass beads collected in Set I (with the fieldwork references).*



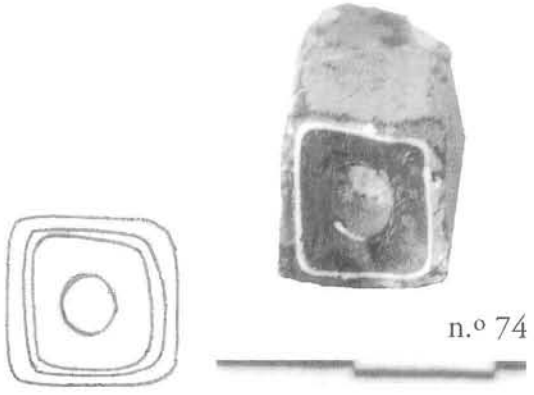


FIG. 9a. *Some morphological aspects and the vitreous-paste layers' sequence of the "Nueva Cadiz" glass beads type - Set I.*

from the 4th level and two of them (n.º 1 and n.º 5) were collected inside the well, which was full of waste material from the earthquake period. Bead n.º 1 is broken in half; Bead n.º 2 is just a small fragment of half a bead; Bead n.º 3 is really well preserved and is complete; Bead n.º 4 is also a fragment very much irisated and corroded as the ones from Set I and shows cylindrical central drilling as well as a prismatic body. These four beads were also obtained through the "drawn beads" method (Fig. 11). Though Bead n.º5 has also a twisted prismatic body and a cylindrical central drilling as well, the cross-section does not consist of different coloured layers, but they show a star pattern on both ends –"chevron beads"– (Fig. 9 b).

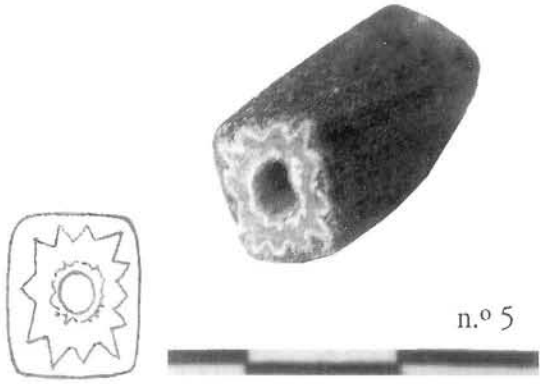


FIG. 9b. *The vitreous-paste layers' sequence of the "chevron" glass bead type - Bead n.º 5 - Set II.*

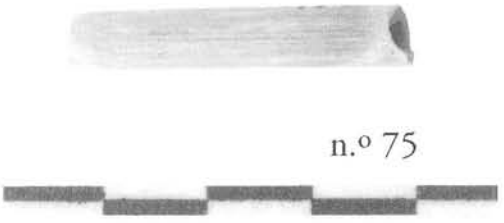


FIG. 10. *Exterior face of the "drawn bead" - Bead n.º 75 - Set I.*

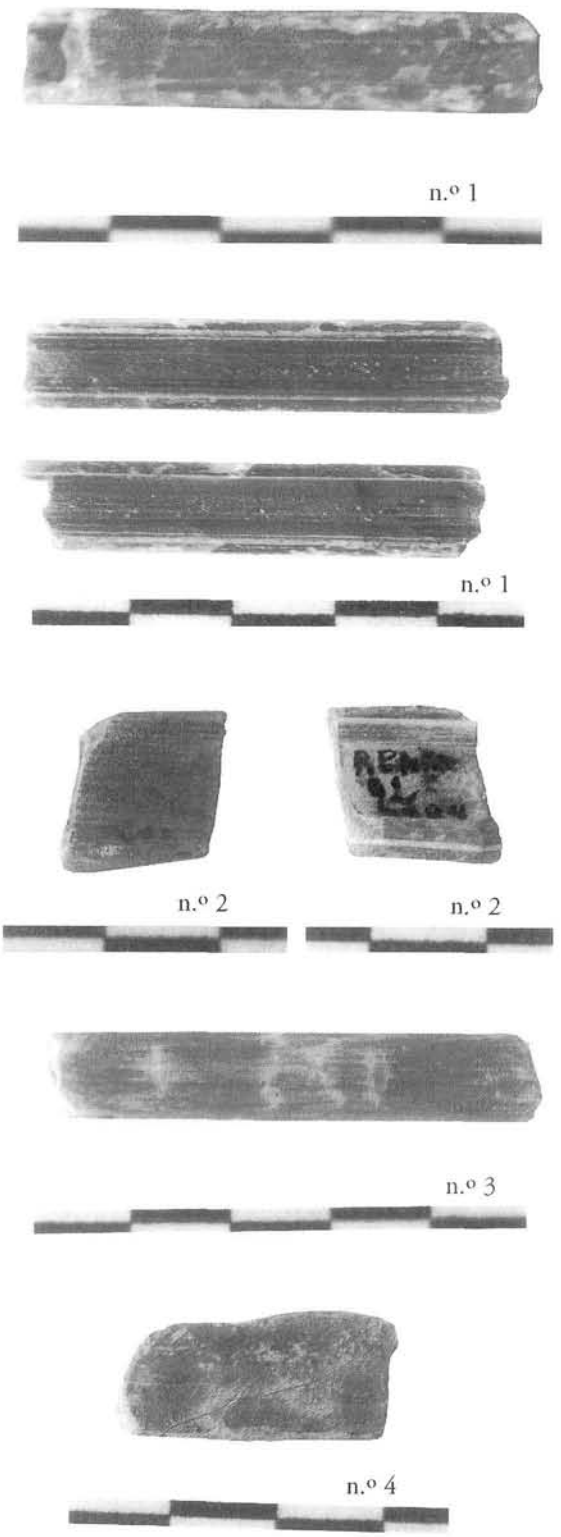


FIG. 11. *The "drawn beads" specimens collected in Set II (referenced according to the text).*

Beads of the Set II (PPJ)

The intervention yielded a significant bead n.º 6 - similar to bead n.º 5; also a "chevron bead", but with a cylindrical body and different colour and morphology (Fig. 12).

6. Morphological study of the beads

Sets I and II

As seen before, most of the glass beads (namely 9) show a prismatic body and plane faces. Two of them are fragments (n.º 2 and n.º 4, both from RPN); four present twisted prismatic body: both specimens n.º 73 and n.º 76 are the most twisted and n.º 77 is the best specimen of the set, regarding its preservation. Bead n.º 82 is also not complete. They present a subrectangular cross-section and triangular-polished

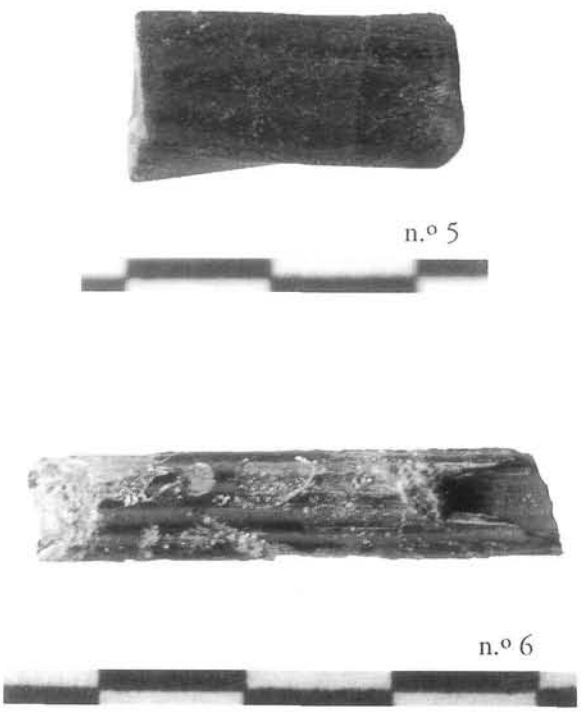


FIG. 12. *The "chevron beads" specimens - Set II.*

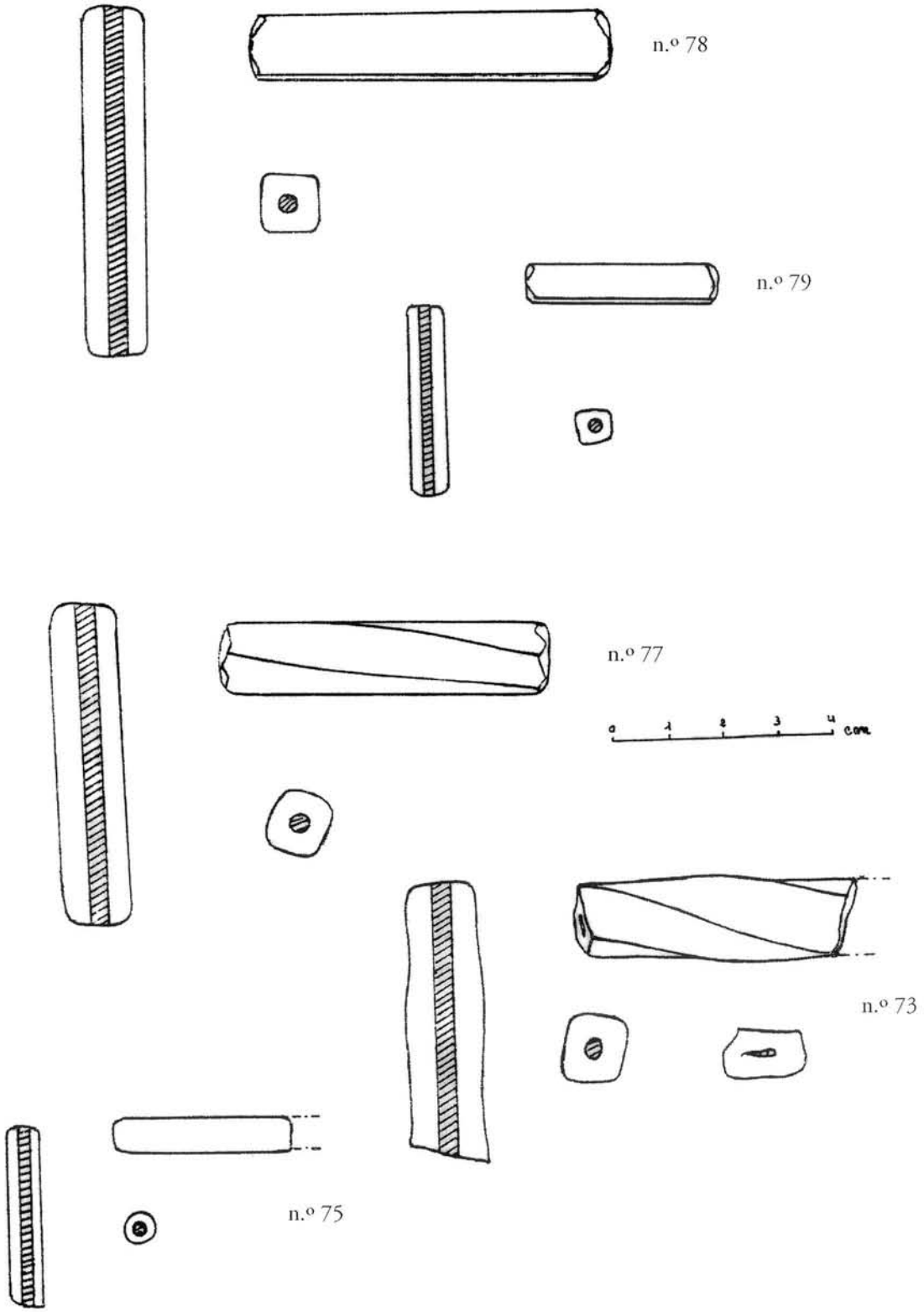


FIG. 13. *Typological drawing of the Beads of Set I.*

edges, which is well documented in the complete beads, showing a final edge-treatment after the initial cut. Bead n.º 75 (Set I) is cylindrical with a cylindrical cross-section as well and it is the thinnest of all.

Specimens n.º 5 and n.º. 6 are morphologically quite different and document another manufacture technique. They show blue and green shades striped exterior surface and a very different body from each other. Bead n.º 5 has a prismatic, well-twisted body with a sub-rectangular cross-section and strong-shaped edges, while Bead n.º 6 presents a cylindrical body with a circular cross section They are known as "chevron beads", because of the typical star-shaped coloured core (Fig. 9 b).

Based on the morphological analysis and on the methodology propounded by Horace Beck (1981), these beads can be considered as "long beads": namely Group IX (square cross-section) D.2.b. and Group I (circular cross-section) D.2.b.

On both groups we can make out three types based on the typological drawings (done by the author) analysis (Fig. 13 and 14):

Type 1. Flat faced prismatic beads

Type 2. More or less twisted faced prismatic beads

Type 3. Cylindrical beads

The colour

All the specimens considered as "drawn beads" are blue, though in different shades and according to the Methuen Handbook of Colour the blue shades are of the following types: 21-D-7, 22-D-7, 23-C-7, 23-B-8 and 23-D-6 (bead n.º 75).

The specimens of the "chevron beads" are of different colours (Fig. 12): Bead n.º 5 has a green surface in two alternate shades: light and a dark green (green is not in the colour code) - (Fig. 18 c); Bead n.º 6 has also two alternate shades but in blue: light blue –23-A-4– and a dark blue -20-C-7 (Fig. 19 b).

Preservation status

The collected beads are in general well preserved, though some are broken and even corroded due to the fact they were underground. A certain degree of irisation was also observed, which altered the surface colours.

Dimensions

The dimensions encountered are very different; according to the morphological types previously defined, the length and diameter according to Horace Beck's Methodology are:

Type 1. among the unbroken beads, the longest (n.º 78) is 63,2 mm long, while the shortest (n.º 79) is 34,5 mm long. Considering all the specimens, the widest diameter measured is 65,5 mm wide (bead n.º 74) while the thinnest is 8 mm wide (n.º 79).

Type 2. The longest unbroken bead (n.º 77) is 59 mm long while the shortest, though broken (n.º 5) is 22 mm long. Concerning the diameters, the widest is 14 mm (bead n.º 73) while the thinnest is 12 mm (n.º 76).

Type 3. There are only two beads in this type and none is complete. The longest (n.º 6) is 37 mm long, while (n.º 75) is 33 mm long. Bead (n.º 6) is 8,9 mm wide, while (n.º 75) is thinner, with 6 mm.

7. Mineralogical and chemical study

The chemical characterisation of the glass beads was obtained by X-.Ray fluorescence spectrometry[3], after a careful microscopic analysis. This technology is the most adequate since is does not alter the texture or the colour of the beads.

[3] Carried out in the Crystallography and Mineralogical Centre of IICT, by Prof. Dr. O. Figueiredo.

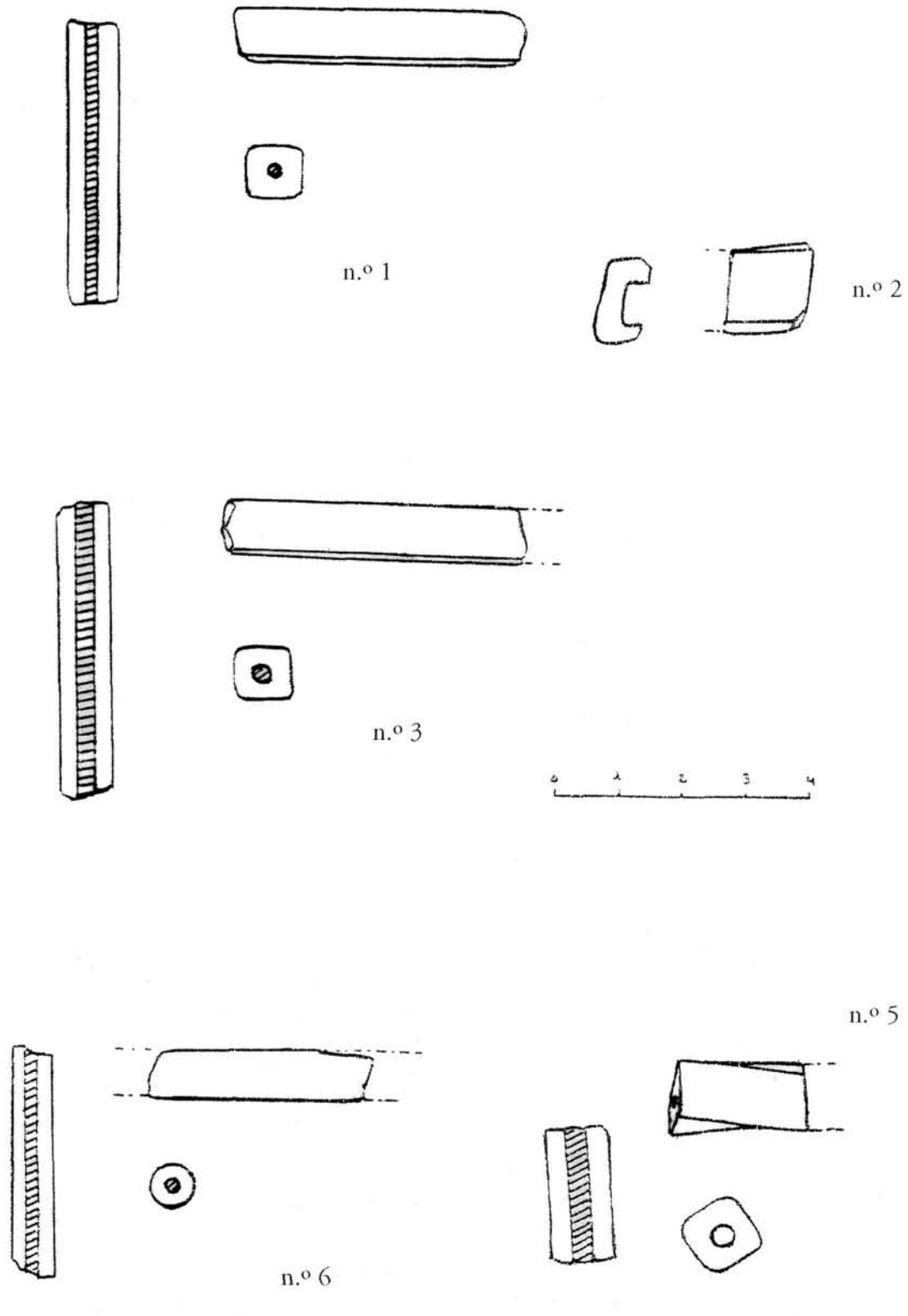


FIG. 14. *Typological drawing of the Beads of Set II.*

The vitreous nature of the matrix was confirmed by X-Ray diffraction and no crystal components were registered. The "drawn beads" specimens present almost the same look[4], showing surface disruption due to the fact they were underground. Whence a thin plate coloured film now covers the glass, originally transparent (Fig. 15 b). The binocular lenses showed clearly the white and blue layer sequence, well documented by the specimens n.º 73 and n.º 82 (Fig. 16). Three or five layers are present, in the former a white layer, always very thin, comes next to the drilling outer layer, before the light blue layer and then again before the turquoise blue layer, which surfaces the bead. When there are only 3 layers the core layers are absent (Fig. 9).

Consideration of the results based on the graphics and charts illustrating the results of the chemical and mineralogical, we can therefore say that the specimens are also much alike, yet with a few differences:

Set I (MRS-94)

Specimens n.º 73, n.º 74 and n.º 76 to n.º 82 show mainly the presence of tin (Sn), lead (Pb), iron (Fe) and calcium (Ca) (high presence), copper (Cu) (highlighted presence) and manganese (Mn), zinc (Zn) and titanium (Ti) and also a little of cobalt (Co), nickel (Ni) and strontium (Sr). Bead n.º 79 has more cobalt and lead as well as a little chromium (Cr), but besides that, it presents the same elements as the ones above. These entire specimens show a homogeneous glassy quartz with the addition of feldspar composition, which demonstrates a mastering of the metal technology, since they were able to produce the turquoise blue colour, showing several shades in the paste and a highly developed manufacturing technology as well.

Specimen n.º 75 is different from the others, both in morphology and manufacture technology. It contains iron and copper in the same proportion, few manganese, lead and strontium, titanium and calcium in the same proportion and shows only one monochrome layer (Fig.17).

Unlike bead n.º 74, which documents a qualified technology –presence of cobalt and a high presence of lead– the bead n.º 75 shows a poorer, and cheaper technology –no cobalt and very little lead– or it was just a way to obtain a more popular bead.

Set II (RPN) and (PPJ)

Some of the specimen are broken and show some surface disruptions as well (Fig.11). Analysis showed the same composition as the beads from Set I, proving that the same raw materials were used as well as an identical manufacture technology. The relation Co/Cu is extremely important, because both produce the blue colour, though in different shades. The colour within this set was achieved using copper (Cu), but refined by the addition of cobalt (Co) to create the different shades.

The "chevron beads" specimens analysis shows, as expected, a difference regarding the manufacture technology and the different colours may point to a different composition. They are a tin (Sn) and rich copper (Cu) and lead (Pb) compositum.

Bead n.º 5 (RPN) has a green core followed by a red shaded star area with a white contour and a green striped surface (light green and dark green shaded pattern) (Fig. 18). The Bead n.º 6 (PPJ) has a blue core followed by a brown shaded star shaped area with a white contour and a blue striped surface (light blue and dark blue shaded pattern) (Fig. 19). Bead n.º 5 is denser than Bead n.º 6, since the latter has a great deal of lead and copper.

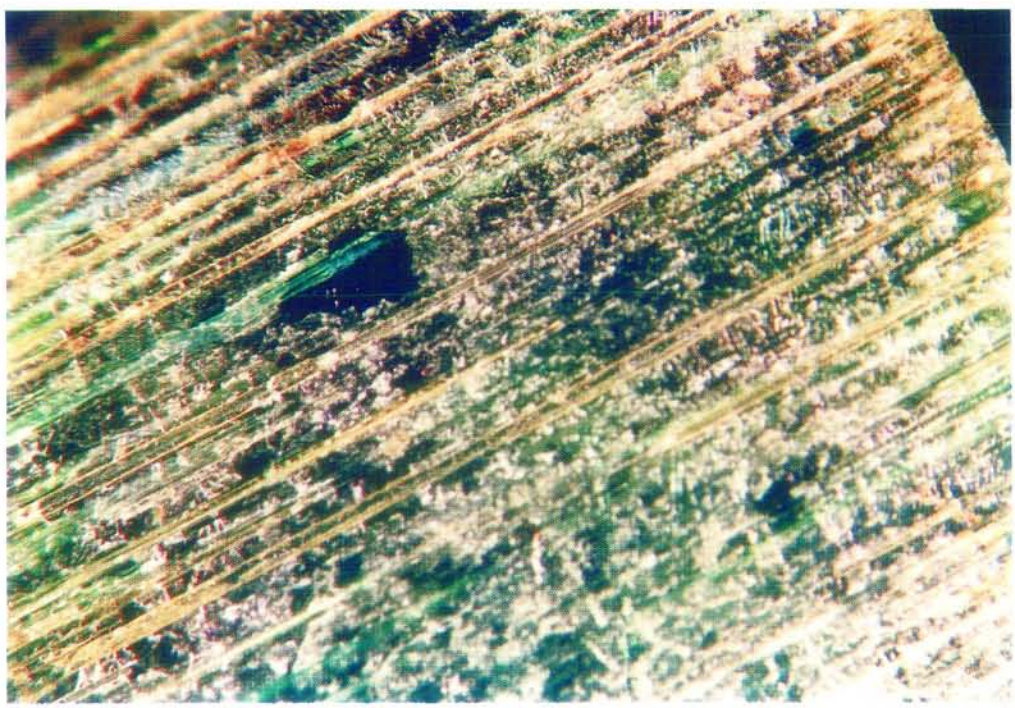
8. Discussion

History and context

The studied glass beads are mainly of the "drawn beads" type. The existent data about the great variety of glass beads produced in Venice

[4] The photographs, which document the beads' structure, were taken with an optical fibre illuminated stereomicroscope in the Crystallography and Mineralogical Centre of IICT, Prof. Dr. O. Figueiredo.

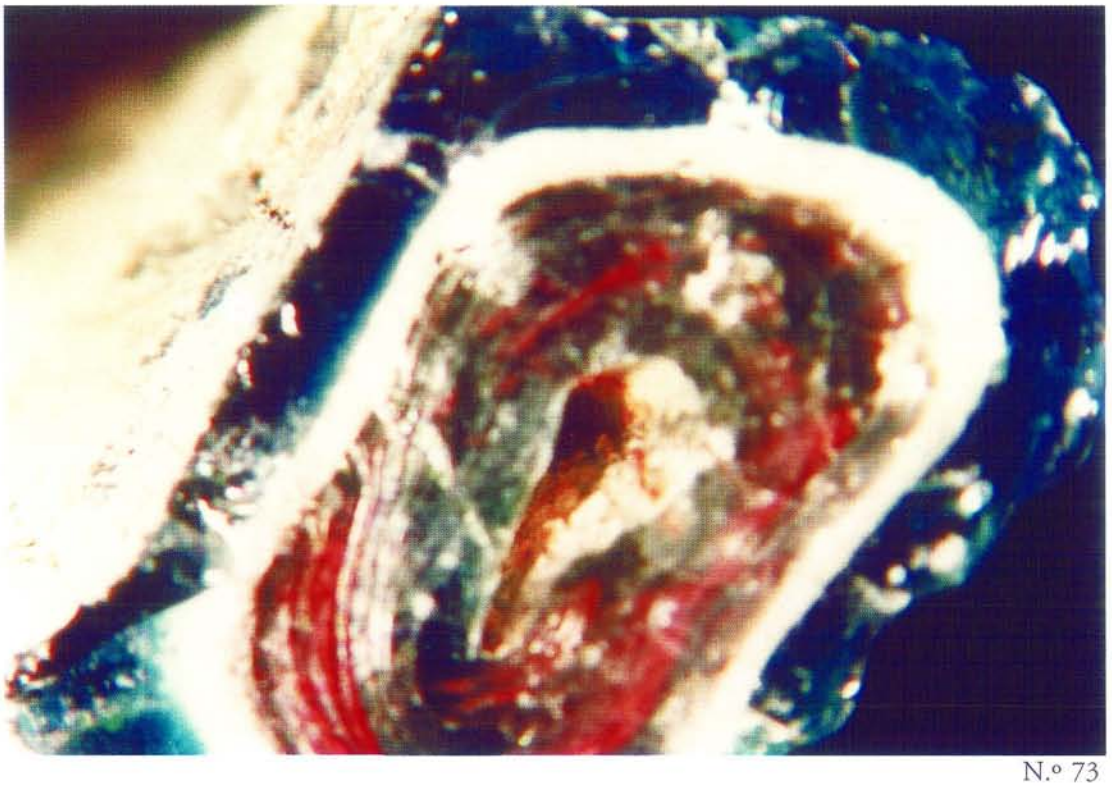
a)



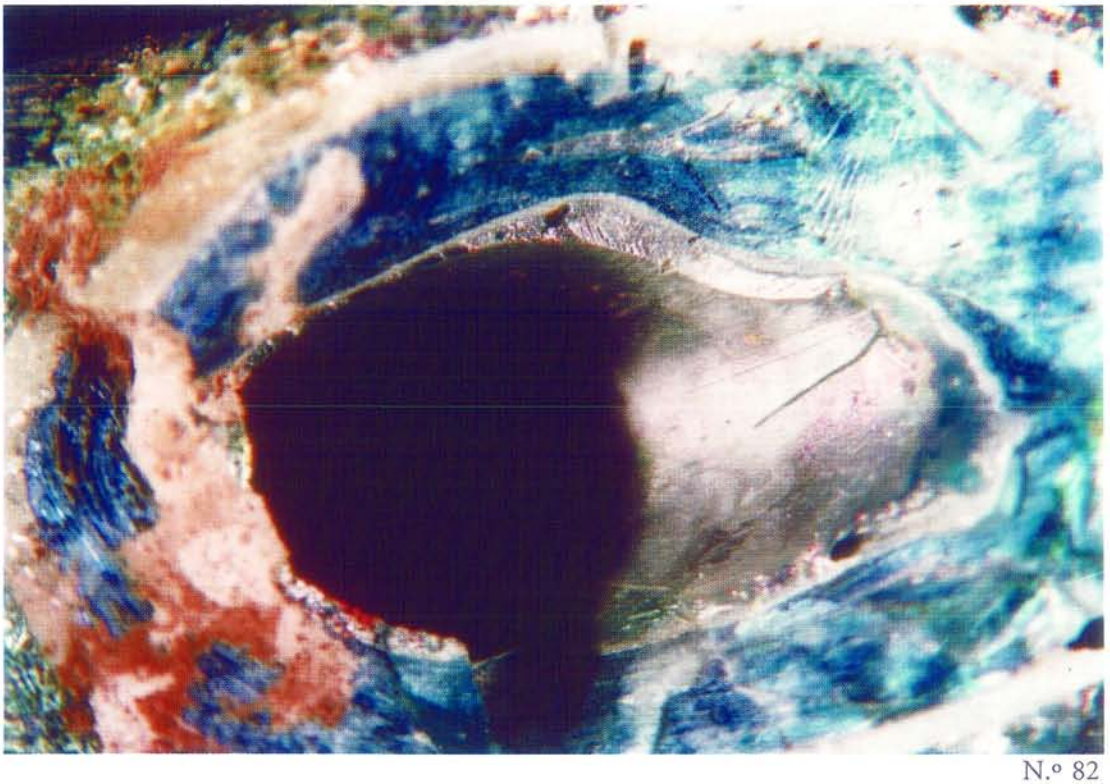
b)

FIG. 15. *Bead n.º 2:*

a) Internal layers' structure. b) Exterior surface.

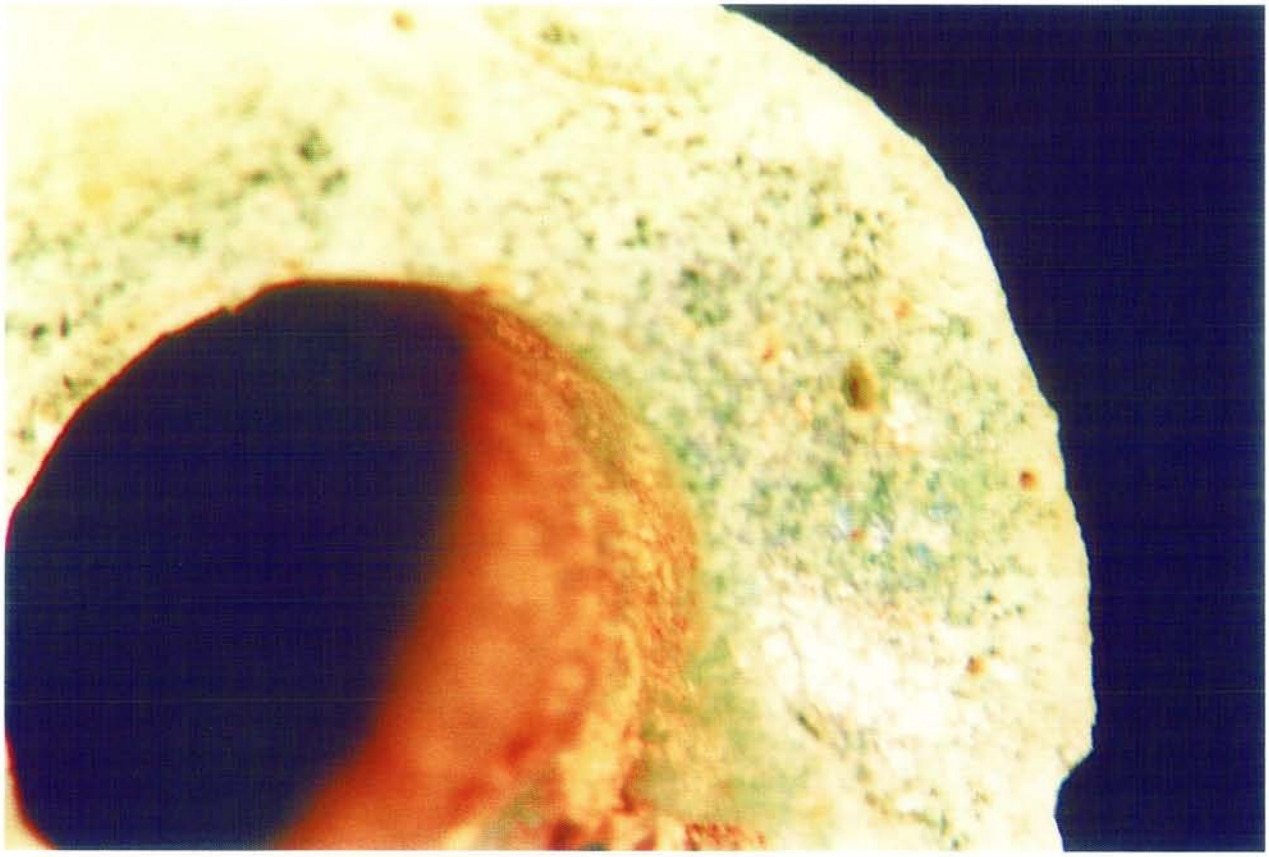


N.º 73

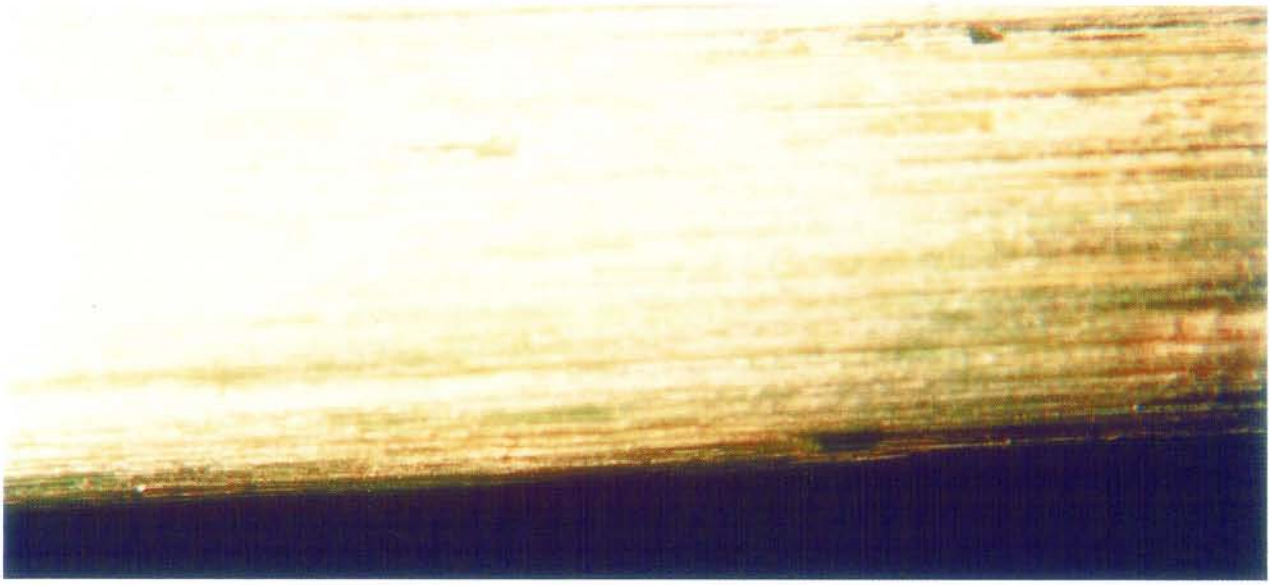


N.º 82

FIG. 16. *Internal layers' structure of the beads n.º 73 and n.º 82, where the blue and white sequence is well documented.*



a)



b)

FIG. 17. *Bead n.º 75. a) Internal structure. b) Exterior surface*

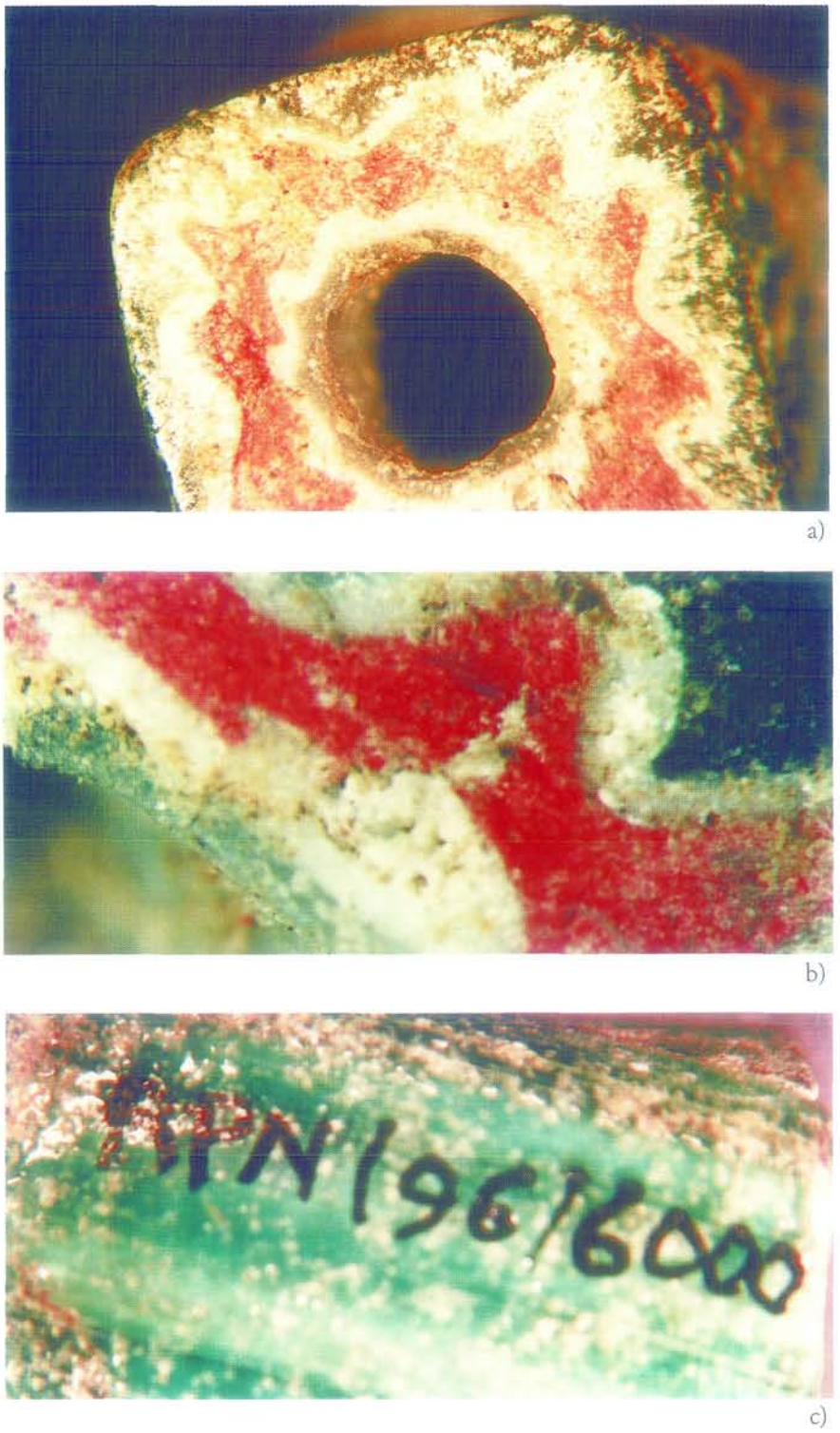
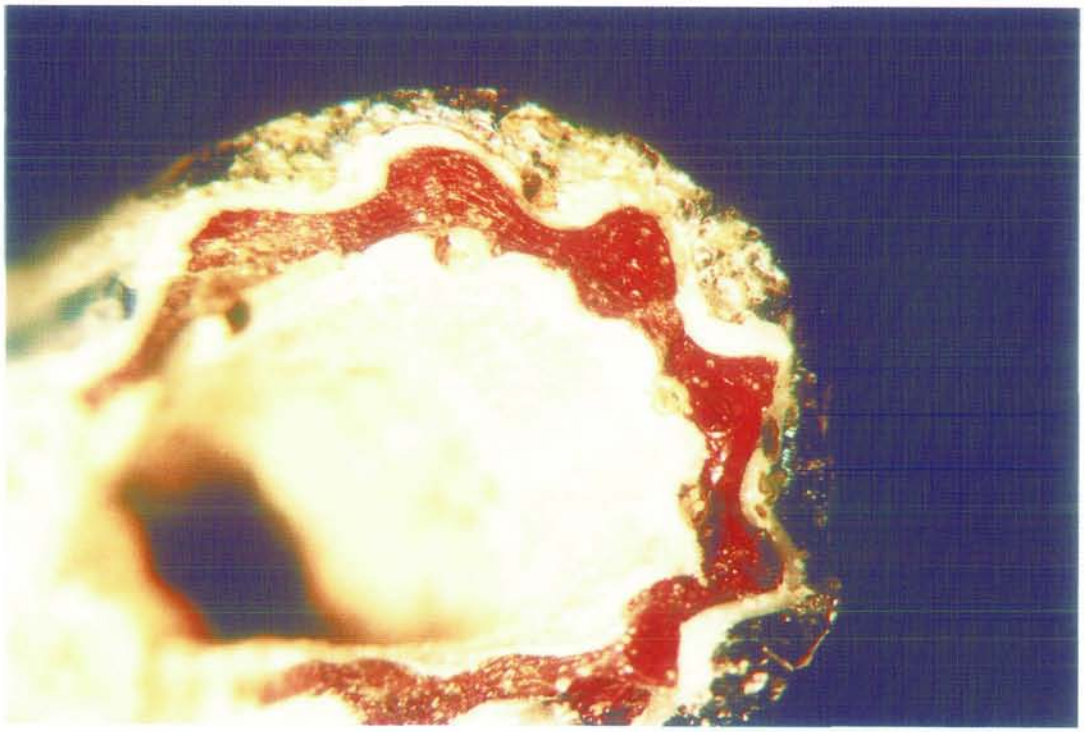


FIG. 18. *Bead n.º 5. a) Internal structure's layers sequence. b) Detail of the internal layers' structure with the different shades: green, white, red and white. c) Exterior surface.*



a)

b)

FIG. 19. *Bead n.º 6. a) Internal structure's layers sequence with the different shades: blue, brown, red and white. b) Exterior surface.*

show no resemblance with the specimens collected in "Baixa Pombalina" regarding either the colour or the dimensions. However they show some analogies with the so-called "Nueva Cadiz" beads, which were collected in Nueva Cadiz, an archaeological site in the island of Cubagua off the Venezuelan coast, occupied by the Castilians since 1498. This type of beads were also found in Peru and other sites in the "New World", all dated until 1550 and absent from sites dated after 1560, Kathleen Deagan (*Artefacts of the Spanish Colonies 1500-1800,* 1987). The Nueva Cadiz archaeological site was related with the pearls trade and suffered immensely with the 1541 earthquake. Small amounts of these beads were also recently collected in ancient sites; L.S. Dubin (1987) argues, "they were initially meant to Peru, where they were brought to in the end of the XV century until the 1560's". Dubin also remarks that "they were also found in Africa", but does not pinpoint the sites' nor the places' exact location. We consider that it may have been in the Congo kingdom, since the known and collected-until-today specimens came from Luanda, M. Conceição Rodrigues (*Contribuição para o estudo das contas de origem Mediterrânica recolhidàs em Angola*-1993).

Kathleen Deagan during archaeological activities carried out in the "New World" collected this type of beads, though in small amounts, and clearly indicates its provenience.

The "Nueva Cadiz" beads manufacture was very sophisticated and derived from an advanced technology, which made them highly expensive. Spanish bead manufacture tradition is non-existent and since its distribution was so much limited, Spanish origin is not likely. On the other hand and just looking at the chronology, the manufacture of these beads can not be also ascribed to the Venetian or to Amsterdam. Regarding the Castilians, they may have transported them, since there are written reports of the ships' loads, according to several researchers, but no evidence points towards a manufacture origin. The division of the Empire of Charles V (who abdicated in 1555) may not have been completely unrelated to this question.

Bead trade was nevertheless fluorescent; great quantities of beads were being taken to the Spanish colonies in the "New World", but they were completely different. They were polychromatic, with red eyes and similar to those imitating the "cornelian" and were widely produced by the Venetian glassmakers.

Another manufacture centre could have been Cadiz (southern Spain), which had been a Phoenician colony. The explanation for the presence of these beads in Luanda and in the "Baixa Pombalina" of Lisbon raises numerous questions. One of the possible explanations we put forward regarding the presence of these beads in Luanda is that they would had been taken to the Congo Kingdom before the arrival of the Portuguese in the XV century or even in the XVI century. Used as exchange item or even as some kind of currency by a certain elite or emboldening a magic-religious value or even to prevent diseases, situations common and with great significance in Africa.

Such a significant amount of the same beads in the "Baixa Pombalina" of Lisbon and in places as "Rossio" (Set I) is challenging and strange. The collected specimens were among remains of an ancient iron-smelting forge, which yielded a great deal of crucible (about 40) and is undoubtedly responsible for the presence of the beads. It is important to remind that the people of sub-Saharan Africa were in the heart of the Iron Age; therefore their metallurgic knowledge was unmistakably deep. The smiths were, as many other africans, brought to Lisbon, as slaves to work in several activities and smithies were one of the activities that needed more specialised workforce.

The transport and "attachment" of slaves was a flourishing business since the middle of the XV century until the XVII century, where Lisbon played a major role. The flux of Slaves was only stopped or decreased due to the publication of the "Alvará do Marquês de Pombal", of September 1761, which made public that slaves could no longer be brought to Lisbon.

Back to our Set I, both the remains of the smelting forge and the type of brick used on the floor lead us to consider the date of the Kingdom of D. João V. Several road works as well as recuperation and new-construction of houses and buildings were ordered by D. João V and

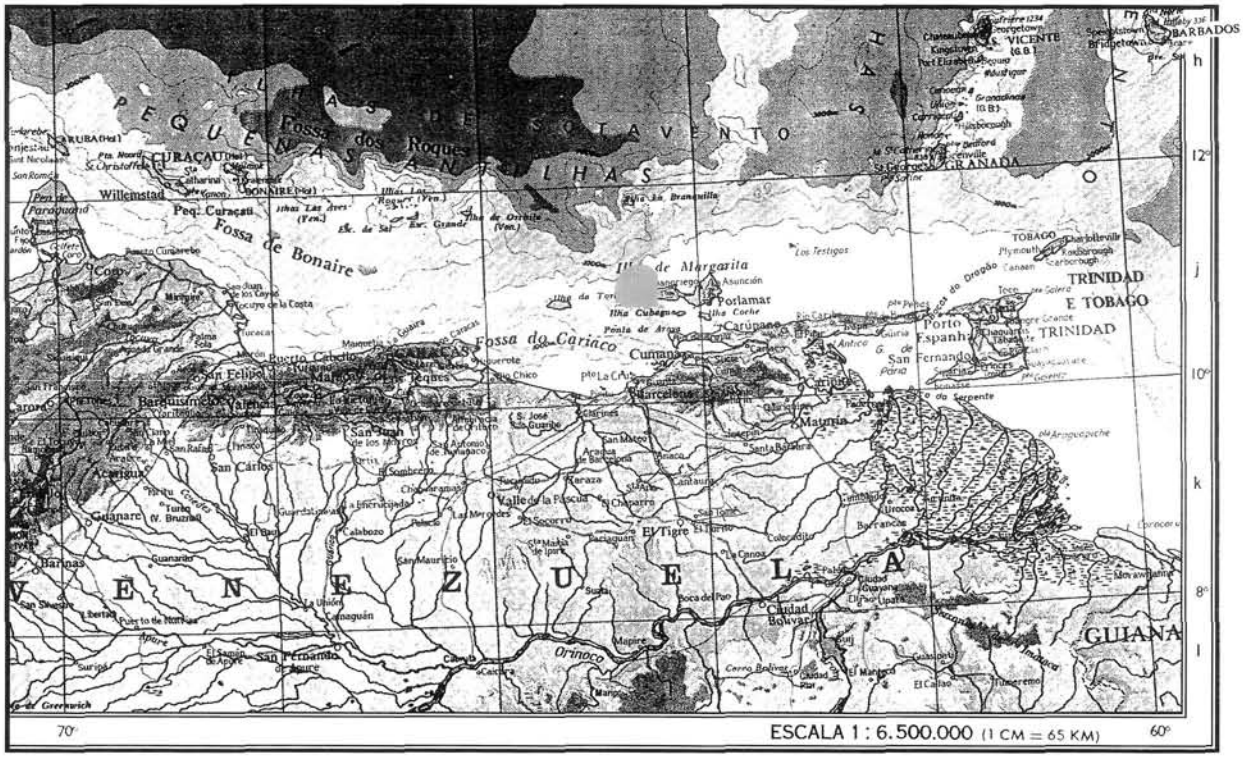


FIG. 20. *Map of the Cubagua Island, where the Nueva Cadiz archaeological site is located, off the Venezuelan coast.*

financed with the money from Brazil, after the 1610's, and was done by slaves. Thus this forge could well be a reminiscence of those times. The black slaves in Lisbon, who were in great number, could have wore a bead around their neck, which represented or documented their ethnic group/place of origin and could also be something sacred or special, which passed from father to son through generations: a symbol of their African culture and past. The smiths were either looked as gods or could even be neglected and considered as "Demiurgos" and find themselves obliged to live in isolated places far from their homelands. However in the Congo Kingdom (which began around the end of the XIV century) they had some privileges only shared by the chiefs. The bead or beads would then be used as a token of socio-cultural identity or even to prevent diseases, as mentioned before and referred by other researchers as Georges Kouyoumontzakis (1983), who collected blue glass beads in western Congo.

Another possibility could be the cultural events, which were being held in Lisbon since the middle of the XVI century, to celebrate the play: "Coronation of the Kings of Congo". This was a sort of mis-en-cene played only by the natives of the Congo Kingdom, which were the majority of the slaves' population. These festivities had a political-religious purpose and were theatrical acts, which showed the importance of the Congo Kingdom, J. Tinhorão (*Os negros em Portugal*, 1988). The natives' embassy to the "Mbazi à Congo" to choose a King was reproduced accordingly; a priest, instead of the African religious leader "Mani Vunda", did the coronation and the act took part in the Brotherhood of Nossa Senhora do Rosário, in the S. Domingos Church. These plays were documented until the XIX century and still continue to be played in the streets of Brazil, with the name of "Congadas".

The presence of such a special, expensive, prestigious and hard-to-get type of glass beads

could well be linked to the way black slaves in Lisbon pictured the distant Congo Kingdom, once their home. Despite the fact that "chevron beads" type was one of the most popular, its presence is not significant in this set when compared with the "drawn beads" specimens, which can be considered, based on the morphology and colour, as a manufacture of the XVII century or even beginnings of the XVIII century. They do not seem though as a Venetian manufacture, but a Bohemian or a Moravian or even Amsterdam could be a more suitable choice, since the multicoloured type of bead is scarcely documented in Venice, in the XVIII century. It is worth point out that the Dutch were in Luanda during the Felipe's Dynasty.

9. Chronology

The entire studied beads seem to be prior to the earthquake, according to what was previously said. Since we do not have the date or the exact elements about the place of manufacture, we must look at the historical background regarding the Venetians as the "Drawn beads" manufacturers ("Nueva Cadiz" type). The beads were certainly made before the end of the XVI century, when the glassmakers were still in Murano. However this manufacture technology was already completely developed and the production would obviously never had been so small. In addition there is no written record of this type of beads in the Venetian manufacture or production.

About the multicoloured beads, as previously mentioned, they could well be a non-Venetian manufacture, since a large number of this type of beads were produced by Venetians in Amsterdam, at least since the beginning of the XVII century. The Dutch played a crucial role in the bead trade as well as in the slave trade.

10. Final Considerations

One of the objectives of this paper was to present data and lay down new hypothesis about the origin and dispersion of the "Nueva Cadiz" beads. According to these data the turquoise blue beads cannot be considered as a Venetian manufacture, but most likely as an eastern Mediterranean. They would have been taken to the sub-Saharan Africa (through Cairo) and arrived in the Congo Kingdom, prior to the arrival of the Portuguese. Since the XV century and for more than 200 years the natives were bought and taken to Lisbon as slaves to work in almost all activities. Smiths were both powerful and feared in their homelands, so it was expected that they would wear attributes or symbolic elements as beads. On the other hand the *mis-en-cene* of plays as "The coronation of the King of Congo" and others would have enhanced the value of those attributes, since they became the only proof of their ancestral origin. Whence they were valued, respected and treasured through generations.

These beads were only collected or archaeological documented in sites dated before 1560 in Nueva Cadiz and others, in countries of the "New World", which were Spanish colonies often visited by Europeans, as Kathleen Deagan refers. Another researcher L.S. Dubin (1987) reports a small amount of similar beads in Africa, but does not pinpoint the differences or does he states the exact location of the findings. We may consider that this location could be the ancient Congo Kingdom, Luanda more precisely, since this type of beads with some morphological differences were found and collected: some near the sea in the "Praia do Bispo", others in an unknown place.

The full understanding of the manufacture centre's location as well as of the reasons why such a small amount of beads was produced is still on the open and we hope to have contributed to a possible solution.

Finally we cannot forget the importance of Lisbon in the slave trade since the middle of the XV century, which may well clear the matter about the presence of other glass beads' types in archaeological sites in southern Portugal, where a significant number of African slaves were once brought.

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