

A Brief History of the Art of Enameling

Part I

By Osvaldo Patrizzi



△ *Plaque: The Tree of Jesse, attributed to Leonard Limosin. Painted polychrome enamel, Limoges, mid 16th century.*



Osvaldo Patrizzi
Chariman and watch expert

The art of enameling covers a wide range of historical periods. It is distinct from other analogous arts, such as ceramics and glasswork, in that it is autonomous as concerns the materials used, its forms, its fabrication processes, and in its progress, remaining isolated, in a sense, from all the other industrial arts.

For several centuries, enameling was considered a mere form of decoration subordinated to the goldsmith's art. However, around the 15th century, it came to be considered independent, with its own technique, its own schools, and its masters, such as the Pénicauds in Limoges, the Curteys, Cartier, Lellier, Jacques Toutin, Petitot, later the Huauds, and more recently, Dupont, Graf, Adam, Rosselet, and the last of the Genevan enamellers, Poluzzi, who died in 1978.

The production of each period is typical and clearly recognizable. That of the 14th century, for example, is fundamentally different from that of the 12th or the 16th century. The only constants are the materials employed: enamel and a metal base.

There are two categories of enamel. The first to be developed, decorative enamel, was known to the Touranians and later to the Scythians. They introduced it into China during the reign of the Thaiwanti, who transmitted it to the ancient civilizations of the Indus, Egypt, Phoenicia, Assyria, the Etruscans and the Eduans. The pieces comprise jewelry and decorative objects, whose forms are enhanced by the harmonies and brilliance of the colored enamel.

The enamel is inlaid, the contours of the design being fashioned from the metal base itself. When covering metal into which prior engraving has been made, the enamel is translucent. When colors are meant to contrast sharply both with the other colors and with the surrounding metal, opaque enamel is preferred. Incrusted enamel may be «à champs-levés» or «à taille d'épargne».

The latter technique is the oldest, and consists of filling with enamel a cavity in the metal into which a pattern or drawing has been etched. The technique called “cloisonné” or “d’applique” characterizes a pattern of colored enamel separated by metallic laminae which form the outlines of the drawing. The techniques of cloisonné and champlevé can also be used together, generally on a copper base. This is called «émaux mixtes» or “mixed enamel”.

The second category is that of painted enamel. The enamels of Limoges are of this type. Motifs which are given shape and depth by means of varying thicknesses of enamel are painted on a black, brown or dark blue enamel background on a copper plaque. This technique, invented in the 15th century, was developed by artists of the Limousin region, and attained levels of great mastery, leading to an artistic production of the highest quality.

The decorative motifs can also be painted on a white enamel background, similar to the technique of painting on porcelain. This process, the most recent in the history of enameling, has reflected in the course of its brief existence all the discoveries made over the course of a thousand years. Enameling techniques paralleled those of painting, while conserving their specificity. The soft colors of a face, the hazy light of a sunrise, the intensity of shadow, were all beautifully rendered by enamel, as artists such as Toutin the elder, who worked in Blois around 1625, demonstrated. Toutin, indeed, was the originator of the technique of painting on enamel.

Enamel is a vitreous substance made up of sand, silica, and a mixture of potassium salt, lead, and soda, which melts at a fairly low temperature. The proportions of the mixture vary depending on the base to which it is to be applied.

Without coloring, enamel is clear and transparent, and is called “flux” (“fondant” in French). Metallic oxides can be added to give it color while preserving its transparency. It can be made opaque by adding pewter oxide. Unlike paint, enamel is inalterable and eternal.

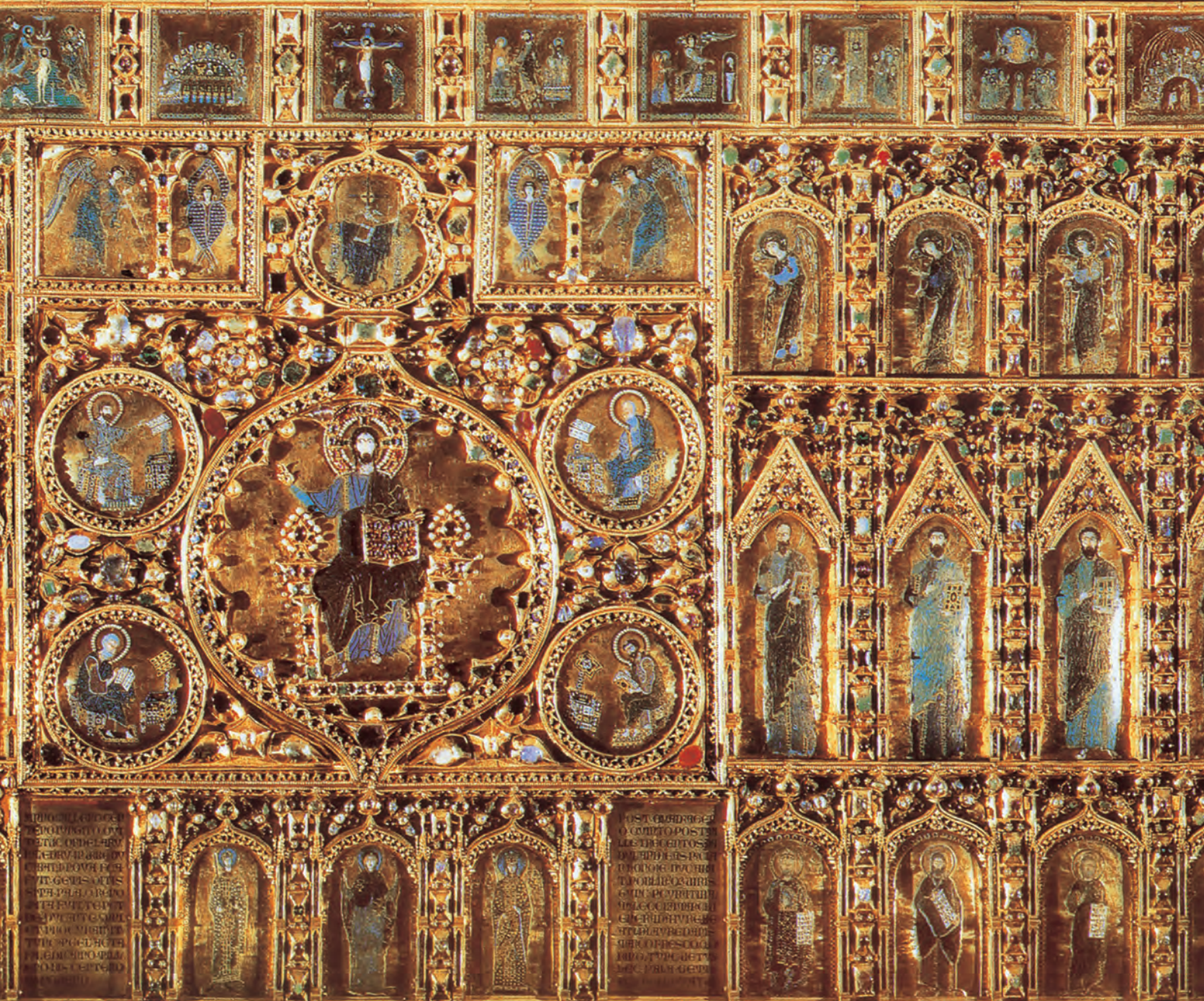
These enamels, transparent or opaque, can be applied to many materials, including earthenware, stoneware, porcelain, glass, lava, and metal (silver, copper, iron, etc.).



△ *Two details of a mirror. Gold and translucent enamels over baisse-taille. These enamels are described in the Inventory of the Treasure of Louis d'Anjou, 1379.*

◁ *Vertumnus and Pomona. Pendant with mirror, painted enamel by Henri Toutin. Paris, circa 1640. Patek Philippe Museum.*





*The Pala d'oro, Constantinople, 12th century.
Gold, silver gilt, cloisonné enamel on gold, pearls, precious stones. Venice, Procuratoria di San Marco.*

Few questions have led to as much controversy among archeologists as the origin of enameling. It seems clear that the process of enameling goes back to Antiquity. This was the opinion of La Riatère and it is confirmed by the archaeological finds conserved in several museums. The mentions of enameling in literature confirm this. In the "Odyssey", Homer calls enamel «electron», a name which it retained until the 11th century and which the monk Theophile used in his «Diversum Artum Schedula» (Book of the diverse arts"), in which he described the artistry of the Middle Ages. Hesiod also mentions it in his «shield of Hercules», as does Sophocles in his tragedies, and Aristophanes in his satirical comedies. There is also a mention in the Septuagint.

It remains to be determined whether or not the enamel used during these periods was of the same composition as that used in Late Imperial Rome, during the Middle Ages; or today. This question has not yet been resolved with any certainty.

The technique of enameling was known around the world, by the Greeks, Etruscans, Phoenicians, and the Egyptians, as is proven by pieces found in archeological excavations. It has been argued, however, that the material used was not enamel but either a kind of putty colored by vegetal or mineral extracts, or glass paste. I am convinced, however, that enamel was used during Antiquity to embellish precious decorative objects.

The discovery of enamel is attributed to the Touranians, who lived in the central and eastern parts of Asia. They in turn transmitted it to the Egyptians, who developed and perfected the technique. The Egyptians, who excelled in all the arts, proved to be skillful in enameling and glasswork. Indeed, it is difficult to believe that the Egyptians, knowledgeable in all the techniques employing fire, and whose glass amulets and statuettes, as well as numerous other everyday objects – flasks, vases, utensils – did not know the fusion temperature of oxides.



Among the many objects which can be admired in the Egyptian department of the Louvre is a particularly beautiful piece of jewelry representing a falcon with a ram's head. Its wings are silver and it holds in its claws the seals of eternity. It is decorated in cloisonné enamel, with separations of fine lamellae soldered to its base. Certain pieces in other museums are older by as much as 2000 to 3000 years, but they are in poor condition and their enamel is slowly disintegrating. This piece, it seems to me, proves that Egypt must be considered a practitioner of the art of enameling.

Among the magnificent examples left to us by the Etruscans are pieces of jewelry, many of which show evidence of a profound knowledge of the technique of enamel, as well as great skill.

One of the most important pieces that I have been lucky enough to examine is a Greco-Etruscan diadem in the Vatican museum. A true monument to the goldsmith's art, this masterpiece is composed of an ensemble of gold lamellae of varying dimen-

Common Era, it was practiced even before Julius Cesar's conquest, by a people in the center of what had been Gaul.

The Eduans lived between the Doubs and the Saône, where they had founded the cities of Chalon-sur-Saône and Bibracte. The archeological digs carried out in 1868 on Mount Beuvray near Autun, on the site of what had been Bibracte, revealed many bronze-founding workshops in which enameling was also practiced. The tools were found, as well as the coal-burning kilns and several objects, either complete or in the process of being finished. The workshops had been destroyed by a terrible fire from which the artisans must have fled in haste, taking with them only their most precious belongings.

These finds, as well as the description of the methods used for enameling by the Eduans, are described by J. G. Bulliot and H. de Fontenay in «L'Art de l'émaillerie chez les Eduens» ("The Art of Enameling of the Eduans"). Pieces identical to those found in Bibracte have been found in Hungary, Denmark, Great Britain, and along the Rhine. They show slight variations, but are basically of the same type of fabrication. It is thought that at the time a people of nomad artisans, probably of Oriental origin, traveled with their tools and kilns from country to country, as did the ceramicists who created the red pottery with raised decoration, and who probably came from Italy. This would explain the similitude of these enameled objects found at great distances from one another.

The first renaissance of the art of enameling seems to have taken place in the Orient, during the time of the founding of the Byzantine Empire, when it flourished in the form of cloisonné work.

*Crook of Bishop Hervée, Troyes Cathedral.
Champlevé enamel on gilt copper. Limoges, circa 1200. (Background)*

sions, joined together by an astragal shape along the lower portion of the diadem. The outside is entirely covered with ornaments elegantly disposed and attached by means of gold lamellae. There are many other ornamental motifs, covered with enamel and colored glass beads. Numerous other pieces attest to the skill of Etruscan enamellers, among them small objects in the shape of peacocks, swans, and doves with white bodies and the head and wings enameled in another color.

Although the Orientals and the Etruscans knew enamel work well, the Romans did not discover it for quite some time. It was not until the beginning of the 11th century A.D. that Philostratus (Flavius), a Greek Rhetor who lived in Rome, mentioned enameling in that city. In his "Lives of Sophists", he describes it as being practiced by certain peoples along the coast of the Atlantic Ocean. «These colors were taken from melting sand, they become vitrified but still retain the designs imparted to them.» However, although the Romans did not know this art before the

The Byzantine objects, with their rich enameled ornamentation, are reminiscent of the luminous colored patterns of their churches and palaces. Traces of such works can be found in the catalogue of the gifts presented by Emperor Justin I (518-527) to Pope Hormisdas (514-523). Among them was a golden oil lamp whose description suggests that it was enameled, for it is called "agabatam electrinam", meaning «electron lamp».

Another example of these creations is the golden altar that Justinian (527-565), the famous successor of Justin I, gave to the basilica Saint Sophia in 537. Nicetas Acominate, in his 21-volume chronicle of events from 1185 to 1206, recounts the sac of Constantinople during the 4th Crusade in 1204, during which the altar was destroyed. He says that the sacred table was composed of various precious materials, flame-soldered together to form a varicolored and perfectly beautiful whole. It was smashed to pieces, and the fragments were shared among the soldiers.



◁ *Ciboire de Maître Alpais, champlevé enamel on gilt copper. Limoges, circa 1200. Louvre Museum.*

Unfortunately, enameled objects prior to the 10th century are extremely rare. The few pieces which have survived are hardly sufficient to indicate the importance of the art during the period. Among the reasons for their rarity is greed, for the beautiful enamel work was often destroyed in order to recover the precious metal underneath. In addition, in Constantinople, the iconoclastic edicts of Leon III the Isaurian (717-741) and of his successors, forbidding the representation of the human figure, led to the destruction of many works of art. This destruction, which lasted almost a century, led to the loss of innumerable treasures, and led artists to concentrate their talents on geometric patterns, floral or fruit motifs, and animals.

In 843, the regent Theodoros having rescinded the iconoclastic edicts, the art of working gold and precious metals blossomed again, and with it the art of enameling, which attained a splendor never before equaled. This period reached its apogee under the reign of Constantine VII Porphyrogenitus (913-959) who, encouraged by his uncle Alexander and his mother Zoe (913-960), devoted himself to the study of the arts, the sciences, and literature, and encouraged architects, painters, mosaicists, and goldsmiths, until he came of age. During these fertile years, a new freedom appears in artists' renderings, along with a purity of line in contrast with the heaviness of the previous century. However, commissions were rare, for few individuals or religious orders were wealthy enough to order pieces of great value, with the exception of the Church and nobles at the Byzantine court. Many mediocre objects for religious use, such as reliquaries and crucifixes, were made for the French, Venetian, and English markets.



Among the most important and significant of these Byzantine exports is the famous iron crown of the Lombard Kings, conserved in the Monza cathedral near Milan. It is a simple gold ring, 7 centimeters high, with 6 plaques separated by three vertical cabochons. Each plaque is decorated with semi-translucent green enamel in which are red, blue and white flowers within cloisonné, enhanced by precious stones. Inside the crown, an iron ring consolidates the gold one, hence the name of the crown. Legend has it that it was forged with the nails of Christ's cross. This crown was presented to the cathedral by Theodolinda, queen of the Lombards, after her marriage to Agibul in 591.

Another famous piece, of the same origin, is the «pala d'oro» in the San Marco basilica in Venice. It was made in 1105 in Constantinople and can be considered the most important work of goldsmithery of the Middle Ages. It is also the richest in Byzantine cloisonné enamel. This antependium depicts scenes from the passion, events from the life of Saint Mark, the apostles and the prophets. At the lower central portion, three plaques represent the Virgin, the doge Ordelafo Folerlo and the Empress Irène.

The date at which cloisonné enamel was introduced to the Occident, and particularly to German territory was probably the year 972, during which the marriage of Othon II, the son of Othon I, to Theophania. The young princess, who had been taught to appreciate the arts since childhood, brought with her magnificent jewelry which had been made by the most skillful goldsmiths of the Empire. She also had many artisans working for her in Trêves, near the Imperial court.



Ring belonging to the future Emperor Basil I. 865-866, Constantinople, gold, niello, and a table-cut emerald with an intaglio bust of Christ.



Bracelet, 9th -10th century, gold and cloisonné enamel. Thessaloniki, Byzantine Culture Museum.



◁ *Emperor Leo VI's Votive Crown, 886-912, Constantinople. Gold, cloisonné enamel and pearls. Venice, Procuratoria di San Marco.*

In this city schools and workshops had been established, under the enlightened direction of Bishop Gerbert (977-993) tutor of the young Othon III, of Saint Beuward, and later, the Bishop of Hildesheim (992-1022). Thus German art, still very primitive, was regenerated, and works of art that can still be admired today were produced.

The artistic renaissance that had begun so auspiciously during the reign of Empress Theophania continued under Henry II (Saint Henry), Emperor of the Occident from 1002 to 1024. Leo of Ostia relates that he placed upon the altar of Saint Benoit a calice decorated with precious stones, pearls and the most beautiful enamels (“gemmis et margaritis se smaltis optimis adornatum”). To the application of precious stones to filigree work or engraving, previously used by Occidental goldsmiths for the ornamentation of their work, succeeded a more sober and symmetrical form of ornamentation, inspired by traditional Greek art.

During this period, enamel plaques began to be used in pieces made of precious metal, forming borders with plaques with inset stones, decorated with filigree work. For a long time, this type of enameling, transported to the Occident by Greek artists, did not reach the same level of mastery as that of the German artists, who showed exceptional capacities. It was at this time that copper began to be substituted for the gold used by the Greeks as a base for their enamels, lowering costs and allowing the decoration of plaques of larger dimensions. This in turn made it possible to represent different, and more complex, designs. The use of copper therefore brought only advantages.

Aside from this difference, the cloisonné techniques of the Byzantines remained unchanged for a long time. Artists cut a sort of “frame” into the metal, onto which geometrically-shaped lamella were soldered to contain the enamel. This technique evolved little by little, as the lower portions of the *champlevé* took on greater importance, leaving less space for the cloisonné portions.

The technique of cloisonné by means of lamella soldered to carved-out portions of metal was too time-consuming and too difficult to remain in use for long. It was soon abandoned in favor of a much easier technique. One of these new processes was the blending of cloisonné and *champlevé*. The dug-out portions of the metal, for example the heads or feet, were given detail with the etcher’s needle. They could then be enameled with care, while the clothing, which required less skill, was simply filled with a coat of enamel within its cloisonné frame. Another technique employed consisted of lightly engraving in the metal the contours of the head, feet and hands of the figures, while giving greater detail to the bare limbs or the clothing, and then enameling them.

There is a fine example of this technique in the Musée de la Sénatorerie in Guéret. It is the *chasse* of Saint Stephen, which dates from the last decade of the 12th century.

The art of enameling spread from Trèves to other towns along the banks of the Moselle, until it reached Verdun. This important city, at the beginning of the 12th century, had its own school of goldsmithery and enameling. It is there that Nicolas de Verdun was trained. Summoned by the monks of the rich abbey of Klosternenburg near Vienna, he decorated the famous “Verduner altar”, which was finished in 1181, and transformed during the 14th century into an altar-piece.



Chasse of Saint Stephen, Limoges, last decade of the 12th century



Engraved gilt brass and champlevé enamel. Guéret, Musée de la Sénatorerie.

This masterpiece, almost 5 meters long and 1 meter 10 cm high, is made up of 51 enamel plaques placed in three rows, the highest side of which has three lobes. Each plaque measures 0,23 m. x 0,68 m. and features a scene from the New or the Old Testament. The rows are separated by metal bands engraved with blue enameled capital letters reading: «*anno miileno cento sotuageno I nec non undigno gwernherus corde sereno I sextus prepositus tibi virgo maria dicavit I quod nicolaus opus virdunensis fabricavit*». The artist chose to engrave the scenes on the metal, enameling the background. This procedure, as we have said, was quicker, easier, and less costly, and was therefore a good choice for the depiction of scenes with many figures.

It is known that the technique of enamel painting existed in France as early as the 6th century, the time of Saint Eloi, at the Chelles abbey.

From the 12th century onward, inlaid enamel decoration became extremely popular in France. Each city with an enamel workshop produced this type of work. Limoges, however, was the principal center of this industry, and was so highly reputed that enamel work on precious metal came to be called «*Limoges enamel*», even if it did not come from Limoges. These objects were particularly sought-after abroad, especially in England, where several artisans from Limoges had been summoned in order to work on important pieces, such as enameled plaques for tombs. In an article in the «*Archeological Journal*», Albert Way quotes a manuscript which establishes that in 1267, Maître Scan of Limoges, a goldsmith, was commissioned to decorate the tomb of Gautier de Merton, bishop of Rochester.

Limoges enamel remains highly ornamental until the end of the 13th century, but retains evidence of imitation of German work of the time. The figures in relief, ornamented with pearls and precious stones, contrast with the enameled copper background decorated in a manner which imitates that of the Rhineland artisans

The Limousin artists worked rapidly, making the various sorts of decorative and sacred objects requested by their clients in fairly large quantities. Alongside these decorative objects, the production of Limoges includes many domestic utensils such as gemellions, and pitchers with their accompanying basins for washing one's hands. They are decorated with coats of arms, imaginary animals, grotesques or scenes from everyday life. The famous bride's chests are similarly decorated.

This type of enameling on gilt copper reached its apogee during the 12th century. Afterward, it progressively disappeared, for reasons which are unclear, but which may be linked to the period of great opulence which followed the victories of Charles V (1237-1280), during which time decorative pieces tended to be made of nobler metals than copper. The techniques of engraving, embossing, chiseling and perforation played an important role in the fabrication of these pieces. Although the decoration of gold and silver with enamel was not abandoned, however, this technique alone was no longer sufficient for the skillful artisans who wished to satisfy the tastes of the times, decorating their pieces with mythological and historical scenes.

Another reason for the disappearance of cloisonnés may be the discovery of translucid enamels. Invented in Italy, they made it possible to cover the finest engraving with rich color, and even to add shading, thus creating veritable miniatures with vibrant colors.

It is conceivable that these two factors had a joint influence on Limoges enameling, which for more than a century had to scale its market down from a European one to a purely domestic one, producing mediocre copies of old-fashioned items, for poor churches who could not afford to spend much. This state of decadence continued until the Limousin artists discovered a new type of enamel which took precedence over all the others: enamel painting.

Cloisonné, a long, difficult, and costly process, can be said to have disappeared along with the Byzantine civilization which created it.

Transplanted into Germany, it was transformed, becoming *champlevé*. This technique developed along the banks of the Rhine, and allowed the creation of remarkable, purely ornamental pieces, which, in the Limoges region, led to a completely industrialized production.

In the meantime, the use of different materials resulted in a growing transparency of colors. Goldsmiths came to consider enamel so precious that artists began working



Detail of the Chasse of Saint Stephen, preceding page.

in the medium to create works of a new type of inspiration. Rather than contain enamel within cloisonné, a procedure which had a rigidity which did not suit the new vivid, expressive style, the Italian goldsmiths used its rich colors to enhance the fineness and delicacy of the chiseling and, according to Vasari

(painter, architect and writer, 1512-1574) to realize a “kind of painting blended with sculpture”. In this new technique, chiseled metal and enamel are equally important, mutually enhancing each other. The artist, after having chiseled the gold in bas relief, covers it with the enamel powder, then places it in the kiln to vitrify the enameled portions, giving them an intensity of color which varies with the thickness of the layer of powder and the color of the gold, in an infinity of shades.

Soon many different colors became available and it was possible to paint true polychrome miniatures on metal that were of great delicacy and beauty. The few rare pieces that have survived furnish an idea of the type of work that was produced.

Many writings on enameling mention Giovanni da Pisa (1240-1329) as the pioneer of this procedure. Vasari says that he was called to Arezzo to realize a marble altar-piece with mosaic figures, leaves, and ornaments in enamel on silver. Translucent enamel over metal in bas-relief rapidly became a popular technique, and all the Italian goldsmiths became enamellers as well.

The best-known in the 14th century was Andrea Agnolone, who created the small silver altar-piece of the Saint-Jacques de Pistoie Cathedral, finished in 1316. Berto Cen, who began work on the trimmings of the altar of the baptistery of Florence on which Leonardo di San Giovanni also worked, Ugalino de Sienna, Pietro and Paolo d’Arezzo, le Borgino of Milan, all created signed pieces which can be admired even today.

In the 15th century, Tommaso Finiguerra, said to be the inventor of *taille douce*, Guido of Florence, Giovanni di Turini of Sienna, Salvatore Pilli whose talent Benvenuto Cellini praised, and above all, Anto-

nio Pallaiuolo (painter, sculptor, engraver and goldsmith, 1406-1438) who produced a number of important works, all continued the artistic work of their predecessors. Although the procedures remained basi-

cally the same for two centuries, certain details could vary. For example, some bas-reliefs, instead of being chiseled, are engraved with deep lines. Others are engraved with geometrical patterns resembling engine-turning, making the background vibrate underneath the coat of enamel.

The technique of enameling on gold spread rapidly throughout Italy toward other European countries - France, Germany and Holland, where inventories from the 14th and 15th centuries often mention enameled objects. Many pieces made of enamel on gold were later designated “*basse-taille* enamel”. This term was particularly in use during the 16th century, following the discovery of Limoges enamel.

The second part of this article, concerning painting on enamel from Toutin to Poluzzi, will appear in the next edition of the “Vox”.