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Etablissements Gallé and the Industrial Mold-Blown or “Relief” Series of the 1920s

Samuel Provost

ABSTRACT

The history of the Etablissements Gallé after 1918, under the management of Paul Perdrizet, is often regarded as the mere industrial exploitation of the simplest of the glassmaking techniques perfected more than a decade earlier by the founder of the company, Emile Gallé. But among the most popular Gallé series from this period, the so-called mold-blown and acid-etched vases and lamps stand out as a major attempt to introduce some changes borrowed from the common glass industry. Recently discovered archives allow us to identify the designers behind this innovation and to explain why it remained both limited in scope and short-lived.

* * *

The last period of the Etablissements Gallé, from the death of Henriette Gallé (Emile Gallé’s widow) in 1914 to the clearance sale of the factory in 1936, is paradoxically the most productive and successful, from an industrial and commercial perspective, and the least known. Today, most of the “Gallé” objects on the art and antiques market come from 1919–1931, but little is known about their design and production (Fig. 1). This period is usually dismissed by saying that the Etablissements Gallé perfected the simplest and most cost-effective techniques practiced by Emile Gallé (1846–1904), while giving up on his more ambitious experiments and failing to rejuvenate their line of products with new, inspired designs.

This summary is broadly true, but it fails to account for several attempts to break from tradition and to introduce new designs, trying to capture the evolving taste. The so-called mold-blown series of vases and lamps from the 1920s are one such attempt. The Elephants, the Arum vases, the Rhododendrons, and the Cherries lamps are well-known examples of this technique (Fig. 2). However, their origins and chronology, their importance in the Etablissements Gallé’s commercial strategy, and most of the details about their production have never been studied. Drawing new information from recently discovered archives, both from the Gallé family and from former employees of the Etablissements Gallé, this article aims to shed some light on these matters.

The Reorganization of the Etablissements Gallé in 1919–1920

It is commonly but wrongly stated that the Gallé factory was closed throughout World War I. In fact, the recent discovery of the family’s letters from this period has shown that work in the factory ceased only during the first few months of the war. By the end of November 1914, it was running again, albeit on a much-reduced scale, because of the large mobilization of its work force. Another reason for this limited activity was a recurrent problem with the main glass-melting furnace, which had been shut down in June 1914 with some unexpected and ill-timed structural damage. Its recovery was impeded by the war, and

despite a short stint in the winter and spring of 1917, the Gallé factory never regained its full productive capacity before the firing of an entirely new furnace, built in the winter of 1918–1919.¹

If the Etablissements Gallé continued to churn out thousands of vases and pieces of furniture in the interval, it was thanks to its vast stock of unfinished products inherited from 1914. The Gallé *dépôt* in Paris received more than 4,000 lots of merchandise between September 1914 and November 1918.² The number of glass objects produced during that period was thus well over 30,000. The shape and design for most of them were the same as before 1914, which explains why this production has not been identified until now. But new models were introduced, in wood marquetry as well as in glass, the most recognizable ones being the so-called War vases, commemorative pieces inspired by battles (Grand Couronné, September 1914) and war-related catastrophes (the bombing of Reims Cathedral, October 1914) (Fig. 3).³

The importance of this period cannot be overstated in understanding the evolution of the Gallé factory, because it was the crucible from which a new organization and new principles of production emerged. Following the death of Henriette Gallé on April 22, 1914, her heirs had acted swiftly. On May 1, the four Gallé sisters signed a public agreement to keep the inheritance undivided among themselves, designating the only unmarried sibling, Claude Gallé, as official keeper (*gérante*) of both the family business and the family residence. At the same time, they agreed to a five-year private family association that essentially made one of Henriette Gallé's sons-in-law the only man in charge, under the nominal supervision of a family council.

This new head of the Gallé family was Paul Perdrizet (1870–1938), a well-traveled and -respected archaeologist and art historian, as well as assistant professor (1899) and then full professor (1909) at the University of Nancy.⁴ A member of the large Gallé circle since his arrival in Nancy in 1899, by way of his involvement in social and political activities (most notably in the *Université populaire*), Perdrizet had married the second Gallé daughter, Lucile (1879–1981) (Fig. 4), in August 1906, almost two years after the death of her father. The

1. Samuel Provost, "Une cristallerie d'art sous la menace du feu: Les Etablissements Gallé de 1914 à 1919," in *Composer avec l'ennemi en 14–18? La Poursuite de l'activité industrielle en zones de guerre*, Brussels: Académie Royale de Belgique, 2018 (in preparation).

2. For the Gallé depot in Paris and the importance of its archives for the history of the Etablissements Gallé, see Samuel Provost, "La Signature Gallé à l'étoile: Une révision chronologique et une estimation quantitative," *Journal of Glass Studies*, no. 59, 2017, pp. 349–365, esp. pp. 354–355.

3. For this production, see Samuel Provost, "Quelle direction pour les établissements Gallé après 1914? Les Relations entre Paul Perdrizet et les ouvriers et artistes Gallé," in A. Gril-Mariotte, *Artistes & dessinateurs: La Création dans les arts décoratifs (XVIII^e–XX^e siècle)*, Rennes: Presses Universitaires de Rennes, 2017 (forthcoming).

4. Samuel Provost, "Paul Perdrizet, de l'Université aux Établissements Gallé, le parcours original d'un chercheur éclectique," *Annales de l'Est*, v. 65, no. 2, 2015, pp. 299–317.

young couple settled in the Gallé family house, in an apartment renovated by the Gallé art workers.

While Perdrizet is often credited with helping his mother-in-law run the family business soon after his marriage, he did not have a say in the matter, it seems, before 1909 or 1910. The son of a philosophy teacher in Montbéliard, Perdrizet had no background in business or in the decorative arts. His main assets were a keen mind, a universal curiosity, and a genuine industriousness. In 1910, with his mother-in-law's health showing some decline, Perdrizet began to immerse himself in the factory to learn as much as possible, with the help of its longtime director, Emile Lang. By 1914, he was assisting Henriette Gallé and frequently acting as her deputy in the family business, all while pursuing his academic career. He fastidiously compartmentalized these two parts of his professional activities, wary both of the opinion of his academic peers and of the regulations regarding the operation of a private business while working as a public servant. This explains the uncertainty surrounding his real role in the factory in earlier Gallé studies.

The Etablissements Gallé of the 1920s, perhaps more than in the time of Emile Gallé, were a family business, despite the firm's incorporation in July 1925 for regulatory reasons. Perdrizet, the administrator of the corporation, was closely seconded by Robert Chevalier (1880–1955), who had married Geneviève (1885–1966), the youngest of the Gallé daughters, in 1910. Chevalier was a businessman, owner of a cotton mill in Eloyes, near Epinal in the Vosges. He was an avid collector of modern paintings and a patron of the arts in Epinal, where he commissioned, in 1927, a large Art Deco-style townhouse, with an interior design by Jean-Michel Frank and metalworks by Jean Prouvé, godson of Geneviève. Chevalier probably played a part in the attempt, after 1925, to introduce some new designs in the Gallé series.

All of the other members of the board were from the family, as were all of the shareholders, with the sole exception, for one symbolic share, of Mathilde Keller, widow of Charles Keller. She and her late husband had been old friends and financial backers of the Gallé enterprise. Several of the employees were also members of the family. Pierre Perdrizet (1878–1957), Paul's younger brother, quit his job as a salesman for Automobiles Peugeot to become, in August 1920, the main Gallé representative for France, Paris excepted (Fig. 5).⁵ His wife, Renée Mégnin (1881–1974), was manager of the Gallé retail shop in the rue de la Faïencerie, in Nancy, until it closed in December 1935. Jacques Schœn, a grandnephew of Henriette Gallé's, was the main chemist-engineer at the factory, playing a crucial role in researching batches. Jean Bourgogne (1903–1999), son of Lucien Bourgogne and Thérèse Gallé and the only grandson of Emile Gallé, was trained as a chemist-engineer and groomed

5. Perdrizet's sales catalog is incompletely preserved, but it is an important alternative source of knowledge for the Gallé line of products during the late 1920s, alongside a portfolio of 70 photographs of cameo glassware, now in the Rakow Research Library of The Corning Museum of Glass. I am grateful to Jacqueline Amphoux for allowing me to study her grandfather Pierre Perdrizet's catalog and to publish some of its photographs.

to become director of the factory (Fig. 6). In March 1929, he married Marianne Perdrizet, one of Pierre Perdrizet's daughters, thus reinforcing the family links between the Gallés and the Perdrizets.

The Introduction of Mold-Blown Vases as an Answer to Lalique

Paul Perdrizet was ambitious in reviving the artistic reputation of the Etablissements Gallé immediately after the war. Contrary to what has too often been written about the factory, he accomplished this by introducing drastic changes in the design of industrial series. In the 1960s, Albert Daigueperce, the Etablissements Gallé representative in Paris from 1896 to 1920, told the art historian Françoise-Thérèse Charpentier that Perdrizet thought, at the time, that he would be able to equal or even surpass Emile Gallé's success. This extraordinary claim—whose accuracy could be doubted, given the acrimonious relationship between Perdrizet and Daigueperce⁶—is supported by some accounts of the factory's workers. In July 1919, an anonymous article in a leftist union newspaper violently attacked Paul Perdrizet as director of the Etablissements Gallé. He was accused of betraying the heritage and memory of Emile Gallé, not only by underpaying his employees but also by meddling in the artistic design despite his lack of experience.⁷ This attack came amid social unrest in French industry, particularly in the glass factories. Inflation was running high, wages remained low, and the recently demobilized workers believed that their sacrifices during the war had not been recognized.

On January 25, 1919, Paul Perdrizet wrote to Albert Daigueperce :

Nous avons choisi pas mal d'objets destinés au dépôt renfermant la série de bases cristal blanc que je voudrais voir présenter dans une vitrine de la Paix. Dites à ces Messieurs qu'il s'agit d'une tentative nouvelle aussi artistique que possible : nous avons été quelque peu écœurés des verres moulés blancs lancés par Lalique. Les laideurs du procédé du moulage et la pauvreté de la matière (de verre ordinaire) nous ont incités à faire mieux, en gravant le cristal. Comme il n'y a pas d'exposition en ce moment, nous voudrions que cela fut présenté d'une façon digne de notre effort, c'est pourquoi nous avons donné la préférence à la Paix.⁸

"A la Paix" was one of the most renowned artistic glass and faïence stores in Paris (located at 34–36 on the avenue de l'Opéra), owned by Géo Rouard, a longtime client of the Etablissements Gallé. What new Gallé white crystal vases Perdrizet was writing about is not

6. Albert Daigueperce was dismissed by Paul Perdrizet as the main Gallé representative in August 1920, which concluded a decade of bickering over the operation of the Paris depot.

7. L'Artisan, « Ateliers artistiques », *Le Réveil ouvrier*, 27 juillet 1919.

8. "We chose a lot of objects for the depot containing the serie with a white cristal base that I would like to see exhibited in a showcase of the Paix store. Tell these Gentlemen that it is a new attempt as artistic as possible : we were somewhat disgusted by the molded white glasses launched by Lalique. The ugliness of the molding process and the poverty of the material (ordinary glass) have prompted us to do better, by etching the crystal. Since there is no exhibition at this time, we would like it to be presented in a manner worthy of our effort, that is why we have given preference to the Paix." Letter from Paul Perdrizet to Albert Daigueperce, January 25, 1919. Private collection.

clear. They would have been part of the series blown between August and October 1918 in the Schneider glass factory in Epinay-sur-Seine, because the new glass-melting furnace of the Gallé factory was not yet active in January 1919.⁹ But the crucial piece of information in this letter is that Perdrizet and the directors of the Etablissements Gallé considered Lalique to be their main competitor in the market for industrial art-glass series following the war.

The relations between Emile Gallé and René Lalique (1860–1945) are well known. They began in the 1890s, when the latter was still primarily an art jeweler much admired by the glassmaker from Nancy.¹⁰ It was only after Gallé's death, and a few years before the war, that Lalique made his move to become a glassmaker, first renting and then buying, in 1913, an industrial glass factory from the Compagnie Générale d'Electricité in Combs-la-Ville, near Paris.¹¹ He began to develop a mass production of perfume bottles, in collaboration with the perfumer François Coty, and of other objects.

During the war, all of the major glass factories, with the exception of Gallé's, were required to manufacture exclusively utilitarian glass products for hospitals and the chemical industry. But Lalique was already thinking about expanding his production—and seeking a new glass factory in which to do so. He may even have considered an agreement with the Etablissements Gallé, perhaps for the joint operation of a new industrial site, for in December 1917, he met with Paul Perdrizet in Paris to talk about their respective enterprises.¹² At that time, Perdrizet was desperately looking for a way to temporarily replace the main Gallé glass-melting furnace, which had been shut down the previous June. Nothing came of these negotiations, but they probably warned Perdrizet that Lalique would become a force to be reckoned with in the industrial artistic glass market.

In 1920, Lalique founded his new glass factory, the Verrerie d'Alsace, in Wingen-sur-Moder. The factory, which specialized in bottle and table glass, was established with the help of government subsidies, thanks to its location in ex-German-occupied Alsace, and manned by workers recruited from nearby glass factories in the northern Vosges. From its modest size in 1921, it grew quickly because Lalique's series were very successful. At first, Lalique worked almost exclusively with transparent white glass—and not pure crystal, as Perdrizet remarks in his letter. Most of the pieces were made in cast iron and, later, steel molds, with a carved decorative pattern that produced neat copies with all of the details from the original. The glassblowers began by blowing the glass and then introducing it into these molds, where objects were fully formed by mechanical blowing with compressed air.¹³ The use of cast iron

⁹. Provost [note 1].

¹⁰. Their correspondence has been published in René Lalique, *Correspondance d'un bijoutier Art nouveau, 1890–1908*, ed. Philippe Thiébaud, Lausanne: Bibliothèque des Arts, 2007.

¹¹. Félix Marcilhac, *René Lalique, 1860–1945: Maître-verrier. Analyse et catalogue raisonné de l'œuvre de verre*, Paris: Éditions de l'Amateur, 2011, p. 54.

¹². Letter from Paul Perdrizet to Albert Dagueperce, December 18, 1917. Private collection.

¹³. Marcilhac [note 11], pp. 177–179.

molds and compressed air, which had been initiated before the war, quickly became standard in Lalique's factories. Other series were mold-pressed, a technique that was not repeated by the Etablissements Gallé.

There is little doubt, as Bernd Hakenjos remarked more than four decades ago,¹⁴ that the introduction of mold-blown pieces in the Etablissements Gallé was in reaction to the growing success of Lalique. He had quickly established himself as the foremost industrial glassblower in France, whose works received critical acclaim. In 1925, his creations were everywhere in the Exposition Internationale des Arts Décoratifs et Industriels Modernes in Paris. Verrerie Daum, the perennial rival of Gallé in Nancy, also quickly eschewed the traditional Art Nouveau style and embraced the new style, emphasizing transparency and simplified decorative patterns with a narrow range of colors. But Daum did not follow Lalique in using the mold-blown technique. Although Daum, too, produced some high-relief glass, it favored deep carving with acid etching.¹⁵

At the Etablissements Gallé, Paul Perdrizet was certainly responsible for the decision to follow in Lalique's footsteps, as his correspondence with Albert Daigueperce strongly suggests. In the early 1920s, Perdrizet was eager to establish his position as director of the firm in every regard, including the artistic one. This decision fits his profile in various ways. He had a keen interest in technological progress, and he was concerned, above all, with the profitability of the family business, at the expense, if necessary, of both its workers' welfare and its artistic reputation. During the war, he had once written to Claude Gallé about one of the firm's glass series: "Pourquoi ne se bornerait-on pas à des formes moins compliquées? En ce moment, nous devons viser au simple et à l'expéditif."¹⁶

There is every indication that Perdrizet adhered to a motto of this sort following the war, notwithstanding his artistic aspirations. So he was enticed by a new technology that promised long-term financial gains at the cost of short-term investments—which he held to a minimum. Although the initial expense of the cast iron molds was high, the theoretically limitless number of copies they could produce was a strong attraction. The longstanding director of the factory, Emile Lang, who was responsible for its day-to-day operations, certainly advised Perdrizet in this regard. As his letters to Henriette Gallé and then to Perdrizet attest, his main interest lay in the productivity of the factory and the safety of its workers. The use of mechanical blowing addressed both of these concerns.

¹⁴. Bernd Hakenjos, *Emile Gallé: Keramik, Glas und Möbel des Art Nouveau*, Munich: Hirmer, 2012, p. 106 (this is the author's 1973 doctoral dissertation for the University of Cologne, published posthumously).

¹⁵. Noël Daum, *Daum: Maîtres verriers*, Lausanne: Edita, 1980, pp. 62–68.

¹⁶. "Why wouldn't we limit ourselves to less complicated shapes? At this moment, we must aim for simplicity and speed." Letter from Paul Perdrizet to Claude Gallé, April 2, 1917. Private collection.

Another impetus for this technological innovation may have come from another new glassmaking factory: the Cristallerie de Nancy, which Paul Perdrizet knew very well.¹⁷ In 1920, he was one of the main financial supporters of this factory, which was created by Jules Bayet with the help of other businessmen, Gustave Simon (the former mayor of Nancy) and Alfred Krug, and set up across the street from the Daum factory.¹⁸ Little is known about this glassmaking factory, but it was very successful from its inception in 1921 until it was doomed by the 1929 financial crisis and forced to file for bankruptcy two years later. Perdrizet was one of its main administrators ; his investment might be seen as another answer to Lalique's competition in the industrial glass market. The Cristallerie de Nancy first specialized in perfume bottles and then expanded its repertoire to include various kinds of table glasses and other glass products, many of which were mold-blown and -pressed. The firm employed such renowned artists as Auguste Houillon (1885–1954) and Aristide Colotte (1885–1959). One might therefore wonder if Paul Perdrizet took his cue from the Cristallerie de Nancy in introducing the mold-blown technique at the Etablissements Gallé.

An Introduction in Late 1925?

The precise date of the introduction of the new mold-blown Gallé series remains unfortunately elusive. One expects such an innovation to have been publicized at a major exhibition, as it was in the time of Emile Gallé and as Paul Perdrizet suggested to Albert Daigueperce in 1919. The Etablissements Gallé were present at the exhibition "Verreries et Emailleries Modernes" in the Palais Galliera in 1923, but nothing in the few critical accounts of their display indicates that the mold-blown series was shown there.¹⁹ The vases described in those accounts can be identified as the creations of Jean Rouppert (1887–1979), the main artist since the death of Louis Hestaux (1858–1919) and the departure of Emile Nicolas in 1919. They were multilayered crystal vases with acid-etched and sometimes enameled decoration (Fig. 7). Some reprised the so-called *intercalaire* technique from Emile Gallé's time, but none offered molded decorative patterns.

¹⁷. Nancy et la Meurthe-et-Moselle, special issue of *Illustration Economique et Financière*, 1923, p. 86.

¹⁸. Philippe Olland, *Dictionnaire des maîtres verriers: Marques & signatures, de l'Art nouveau à l'Art déco*, Dijon: Éditions Faton, [2016], pp. 235–236.

¹⁹. "[Gallé] est encore présent à cette exposition de 1923 et les Etablissements Gallé perpétuent la noble tradition de ces techniques savantes, de cette mosaïque de verre, enfermant dans la pâte les teintes les plus ténues de l'aurore ou du couchant, faisant onduler les algues, comme si la plante était enveloppée d'eau au lieu de cristal, gravant en camée une flore et une faune d'une variété toujours nouvelle, sertissant sur les parois des vases des gouttes d'émail semblables à des gemmes" ("[Gallé] is still present at this 1923 exhibition and Etablissements Gallé maintain the noble tradition of these learned techniques, of this glass mosaic, capturing in the molten glass the most tenuous hues of the sun rising or setting, making the algae wave, as if the plant was immersed in water rather than crystal, etching in cameo some always renewed flora and fauna, setting on the vases' sides drops of enamel like gems." Henri Clouzot, "Verreries françaises modernes," *Art et Décoration*, no. 44, 1923, pp. 97–112, esp. pp. 98–99.

The Etablissements Gallé seem to have shunned most of the major exhibitions thereafter, as well as most of the opportunities to advertise their work in a competitive setting. For instance, in a special 1923 issue of *Illustration Economique et Financière* devoted entirely to industry in Nancy and Meurthe-et-Moselle, Gallé was the only one of the four major glass factories in Nancy not to buy at least one page; Daum had three pages, with a special editorial by Antonin Daum, while the Cristallerie de Nancy and Delatte purchased one page each. The Cristalleries de Baccarat also bought three pages.

Daum and Delatte were also regular participants in the applied arts section of the Salon Lorrain, or the Salon de la Société des Amis des Arts, held each autumn in the Galerie Poirel in Nancy. The Etablissements Gallé, by contrast, never sent anything. Instead, their artists frequently participated in exhibitions under their own name, principally Auguste Herbst and Georges Dethorey, who displayed some oil paintings or watercolors (Fig. 8), but nothing related to the Etablissements Gallé.

The Exposition Internationale des Arts Décoratifs et Industriels Modernes, held in Paris in 1925, was the last major exhibition in which the Etablissements Gallé were listed as participants. Paul Perdrizet and Claude Gallé, as joint managers of the firm, were members of the regional committee in charge of publicizing the exhibition.²⁰ The Etablissements Gallé sent some vases to the exhibition of decorative arts in the Grand Palais. But their presence was almost invisible to the reviewers. In the *Rapport général, section artistique et technique*, v. 5, *Accessoires du mobilier (classes 9 et 12)*, one page is devoted to the contribution of the glassmakers from Lorraine: Daum, Baccarat, Cristallerie de Nancy, and Amalric Walter and Paul Nicolas for the Cristallerie de Saint-Louis. The Etablissements Gallé were again absent. The Gallé firm was also represented in the Pavillon de Nancy et de l'Est de la France, a special pavilion for displaying regional arts, but the reviewers—including Jules Froelich²¹ of *Le Pays Lorrain*, who was a friend of Paul Perdrizet's—failed to mention it. The exhibition was, however, a triumph for the Art Deco style, which made the contemporaneous Gallé creations look quite passé.

It is nonetheless very probable that this 1925 exhibition marked the introduction of the first Gallé mold-blown vases. Jean Bourgogne, writing in 1926, remarked about the new cast iron molds: "Ces derniers présentent en relief ou en creux différents ornements ou décors. Ce sont eux qu'on emploie depuis peu pour faire les grosses pièces à relief telles que

²⁰ Decree for the creation of the regional committee for the 1925 exhibition in Paris, August 9, 1923. Archives Départementales de Meurthe-et-Moselle, 8M26.

²¹ Jules Froelich, "Le Pavillon de Nancy et de l'Est de la France à l'exposition internationale des arts décoratifs et industriels, à Paris, en 1925," *Le Pays Lorrain*, vol. 17, no 6, June 1925, pp. 262–266. See also Émile Badel, "La Lorraine et l'Exposition des arts décoratifs," *L'Immeuble et la construction dans l'Est*, August 30, 1925; *eodem* "Le Pavillon de Nancy à l'Exposition de Paris," *L'Immeuble et la construction dans l'Est*, May 7, 1925.

les séries: oranges - pommes - éléphant - crabe, etc. La gravure intérieure coûte très cher.”²² This important account, which also supplies the generic name of these series, “*vases à reliefs*,” is indirectly confirmed by other sources. In his 1974 memoirs as a worker in the Etablissements Gallé, René Dézavelle placed their creation around 1925.²³

The year 1925 was clearly an important one for the firm, during which it was transformed from a family association to a corporation. For the valuation of its capital, a complete inventory of the stock and tools in the factory was conducted in April.²⁴ For the 17,275 items in stock, finished or unfinished, 41 categories of glass objects are listed, distinguished by function (vases, lamps, boxes, etc.), shape (urn, cone, sphere, etc.), or size, and each is assigned a gross price. The *vases à reliefs* are not among them, which is most peculiar, considering the special molds they required and their higher cost, which presumably prevented them from being bundled in the same category as some vases made in similar shapes. In addition, there is nothing specific in the tools inventory to suggest the use of air compressors, except perhaps for the mention of two electric motors. Metal molds are listed without details, but they were also used for undecorated shapes. It is therefore difficult to escape the sense that, by April 1925, the production of mold-blown vases or lamps was in its earliest stages. These objects may have been designed for the Paris exhibition—where the Nancy pavilion opened at the end of June—but they were probably not yet mass-produced.

The Elephants Relief Vase among Other Animal-Themed Series

Another clue in this regard may be provided by the Elephants vase, which is very unusual among the “Relief” vases (Fig. 9). Large animal-themed designs are rare among the late Gallé glass series. Putting aside the traditional animals depicted on vases and lamps (usually fish, insects, and small birds), at least most of the others have a symbolic meaning linked to a historical event or the commemoration of a special occasion. In addition to the allegories of France (the Gallic rooster) and Germany (the eagle) during the war, such decorations recalled the return of Strasbourg to France in 1918 (the stork, associated with the single tower of Strasbourg Cathedral) and the aeronautic raids of the late 1920s (the sea gull for Marc Bernard’s seaplane, and polar bears, probably for Roald Amundsen’s flights to the North Pole) (Fig. 10).

22. “[These cast iron molds] show in relief or in intaglio different ornaments or patterns. These have been recently in use to produce the large relief pieces such as the series : oranges, apples, elephants, crabs, and so on. The internal carving is very expensive.” Jean Bourgoigne, technical notebook, about 1926. Private collection.

23. René Dézavelle, “L’Histoire des vases Gallé = The History of the Gallé Vases,” *Glasfax Newsletter*, v. 8, no. 6, September 1974, pp. 1–104, esp. p. 27.

24. *Statuts de la société Etablissements Gallé*, April 6, 1925. Notarial archives of Me Droit, Archives Départementales de Meurthe-et-Moselle, 70E190.

Although largely forgotten today, it was once well known that aerial feats were celebrated by some Gallé vases in the 1920s.²⁵ These two last series have the same shape, are made of the same translucent white crystal, and are almost certainly contemporaneous (or nearly contemporaneous) productions. One could therefore argue that the polar bears refer not just to the North Pole, but specifically to Bear Island, the part of the Svalbard archipelago near where Amundsen died when his seaplane crashed on June 18, 1928, while he was trying to rescue another polar expedition, led by the Italian general Umberto Nobile. This dramatic attempt and the accident were closely followed by the press and the public in France because they involved a French seaplane piloted by René Guilbaud, who had taken part in Bernard's expedition to Madagascar two years earlier.²⁶ So, having honored Bernard in 1927 with the Sea Gull (see below), the Etablissements Gallé would probably have done the same for Amundsen and Guilbaud with the Polar Bears in late 1928 or early 1929.

The Elephants vases stand out because they were a mold-blown series, and a seemingly popular one as well. They were made in two colors: ivory and greenish brown (Figs. 9 and 11). The ivory on yellow variation can be seen on a packing room shelf of the Etablissements Gallé in an undated photograph (Fig. 12), presumably taken about 1925 or perhaps on the occasion of Bernard's visit in May 1927. The elephants theme was also employed in marquetry for some small, square tabletops (Fig. 13). The fact that the Elephants glasses were "Relief" vases, with a shape very different from that of the Sea Gull and Polar Bears, suggests that they constituted an earlier series. This is confirmed by Jean Bourgoigne's account, which mentions an elephants series shortly before 1926 (see above).

This theme may have been developed in response to a general public interest in exotic and colonial imagery in the 1920s. Elephants were abundant in the French colonies, including Equatorial Africa and Laos, which was also called the Kingdom of a Million Elephants. In 1925, preparations were well under way for the big colonial exhibition of 1931. There was already a colonial pavilion in the 1925 Paris Art Deco exhibition. But no other Gallé vase, mold-blown or otherwise, can be easily linked either to this vogue or to the use of animals as symbols of special events before and after 1925, which strongly suggests that the elephants design was made for another commemorative series.

This series may have been inspired by the second automotive expedition across Central Africa, later dubbed the *Croisière noire* (Black Cruise). Organized with much publicity by the French automobile manufacturer Citroën, this second expedition of Georges Marie Haardt and Louis Audouin-Dubreuil, following a shorter one across the Sahara in 1922–1923, led a convoy of eight half-tracks (one of which was named *Eléphant à la Tour*

²⁵ Janine Bloch-Dermant, *Le Verre en France: D'Emile Gallé à nos jours*, [Paris]: Editions de l'Amateur, 1986, p. 41.

²⁶ The very popular illustrated magazine *L'Illustration* serialized the whole adventure during the summer of 1928.

[tower elephant]) from October 28, 1924, to June 26, 1925, across 20,000 kilometers.²⁷ The explorers were also photographers and filmmakers. One of them, Alexandre Jacovleff, was a painter and illustrator who brought back striking paintings of the people and the landscape. At the end of the expedition, many pictorial accounts were provided by the press, notably in *L'Illustration*, arguably the most popular magazine of that time. These accounts featured a visit to an elephant farm in the Congo and an elephant hunt, among other episodes. An exhibition was organized in the Pavillon de Marsan of The Louvre, and a documentary film was soon made. The celebration of this colonial adventure with an elephants-themed vase would need to be confirmed by some more specific evidence. The 1925 *croisière noire* was the equivalent on land of a 1927 aerial expedition, which flew over the same countries.

Auguste Herbst as Designer of the Mold-Blown Vases

For identifying the designer of the new series, an important event is the departure from the Etablissements Gallé, on September 15, 1924, of Jean Rouppert, who had been frustrated by unfulfilled artistic aspirations. This gifted self-taught draftsman was also a sculptor and painter with experience in metalworking, thanks to time spent as a blacksmith. For the previous five years, he had been the main artist responsible for drawing the new designs (Fig. 14).²⁸ The study of his recently discovered archives, including his drawings, allow us to rule him out as the creator of the designs used for the mold-blown pieces.

Rouppert was not replaced immediately, but by 1927, two new designers had been retained: Georges Dethorey and Théodore Ehrhart (Fig. 15), who are still almost unknown.²⁹ They are credited with most of the Art Deco-style pieces of the late 1920s, but their hiring appears to have been later than the production of the first mold-blown vases. It is doubtful that they would have been assigned the design of an important new series just after their arrival. According to Jean Bourgogne, the Etablissements Gallé experienced some difficulties in trying to engage new artists at that time. The competition with other factories was severe.

This leaves Auguste Herbst (1878–1961), artistic director of the factory since 1919, as the obvious author of the new designs (Fig. 16). In 1925, he was the last remaining member of the talented team of artists gathered by Emile Gallé in the 1890s. Louis Hestaux, the main painter, and Paul Holderbach, the modeler and sculptor, had died in 1919 and 1921 respectively, while the painter Paul Nicolas had left to set up his own studio in 1919. The last member of the team recruited, in October 1898, Herbst would be the last to maintain Gallé's

²⁷ Jean-Pierre de Rycke, *Africanisme et modernisme: La Peinture et la photographie d'inspiration coloniale en Afrique centrale (1920–1940)*, Brussels: Peter Lang, 2010, pp. 55–72.

²⁸ Ronald Müller, *Jean Rouppert: Un dessinateur dans la tourmente de la Grande guerre*, Paris: Harmattan, 2007. I am grateful to the author for his help regarding Rouppert's career in the Etablissements Gallé.

²⁹ Jean Bourgogne identified both Dethorey and Ehrhart in the photograph taken for the Bernards' visit in May 1927. He also attributed to Ehrhart many of the drawings he gave to the Musée d'Orsay, but almost nothing else is known about them.

artistic heritage in his firm (Fig. 17). In 1905, shortly after the death of his master, Herbst was placed in charge of special projects such as the prestigious display case (*vitrine à deux corps*) for the collection of Gallé vases in the Conservatoire National des Arts et Métiers in Paris. Four years later, he was the main designer of the Gallé display at the Exposition Internationale de l'Est de la France, in Nancy — which was, in effect, the last major Art Nouveau exhibition. Herbst also submitted new designs for the glass and furniture series. He produced some spectacular landscapes inspired by his holiday travels, including the popular *Lac de Côme* large vases that followed a trip in July 1914. Herbst had the full confidence of Paul Perdrizet, with whom he had woven a special relationship: they had worked together, as early as 1908, on some archaeological drawings, followed in the 1910s by vases derived from Greek and Egyptian pottery.³⁰

During the war, Herbst was deported, from 1915 to 1918, to a concentration camp in Villefranche-de-Rouergue, Aveyron, because of his German nationality.³¹ He had been born in Strasbourg, but his father was German. Herbst had fled Alsace to escape his military duties, but he had neglected to request French naturalization. He continued to work from the camp, sending drawings to the factory and remaining in touch with Paul Perdrizet, who tried unsuccessfully to obtain his release. Several landscapes with ruined castles were created during this period.

Herbst's role evidently expanded in the 1920s. In Nancy, at least, the Etablissements Gallé was still somewhat prestigious, and their vases were chosen as honorific gifts. This was the case in 1919, when the municipality decided to send a special present to Georges Clémenceau and General Ferdinand Foch, the two great victors of the war. They were offered some Gallé vases, and Clémenceau received a cup that may have been made by Emile Gallé.³² But the Etablissements Gallé regularly received commissions for new work, wood marquetry or crystal vases, for special occasions and commemorations. Judging from the few accounts of these commissions in the press, Auguste Herbst was the designer for each of them. In 1928, for instance, he created a wooden tray for the 100th anniversary of the Swedish Institute of Forestry in Stockholm, which was made at the request of the French Ecole Nationale des Eaux et Forêts in Nancy.³³ One year earlier, he had designed the Sea Gull vase to honor the aviator Marc Bernard for having completed the first air connection by seaplane between France and Madagascar (see Figure 10).³⁴ On May 12, 1927, Bernard was

³⁰ Samuel Provost, "Les Sources des décors égyptisants sur les verreries et marqueteries des Etablissements Gallé," *Arts Nouveaux*, no. 32, 2016, pp. 30–37.

³¹ I owe this information to the research Marie Llosa kindly conducted for me in the Archives Départementales de l'Aveyron, 4M561 and 4M604.

³² *Journal de la Meurthe*, March 16, 1919. Paul Perdrizet himself delivered to the recipients in Paris this "royal present," as he called it in a letter to Albert Daigueperce, January 25, 1919 (private collection). I have not been able to locate this cup in the Clémenceau estate.

³³ "Un hommage de l'Ecole des Eaux et Forêts," *L'Est Républicain*, September 27, 1928.

³⁴ "Le Comité des fêtes offrira un vase Gallé à l'aviateur Bernard," *L'Est Républicain*, May 8, 1927.

feted in Nancy, where he received from Auguste Herbst and Paul Perdrizet the original Sea Gull vase, with the bird symbolizing his seaplane. Bernard's visit to the Etablissements Gallé's showroom was recorded with a photograph (see Figure 15). Perhaps the undated pictures of the adjacent packing room (see Figures 5 and 12) were taken on the same day.

There is little doubt, therefore, that Auguste Herbst was the artist responsible for most, if not all, of the firm's other larger pieces dating from the 1920s, including the Elephants, the Polar Bears, and probably the earlier mold-blown fruits and floral series and lamps (Figs. 11, 18, 27, and 28). Among his drawings acquired by the Musée de l'École de Nancy in 2014, there is a sketch of a polar bear (Fig. 19) that resembles the design of the 1927 vase closely enough to confirm that the design was his. Herbst continued to work for the Etablissements Gallé until the very end. He was laid off in the early 1930s, when the factory closed.

Production of the Mold-Blown Glass Series

Although the chronology and authorship of the mold-blown designs can be reconstructed, information on the technical aspects of their manufacture is hard to come by. Most of the factory archives were voluntarily destroyed in 1936 to clear the future from the shadow of the past, or so it was explained later.³⁵ Fortunately, a valuable source on this subject survives: the notebooks of Jean Bourgogne.³⁶ After graduating as an engineer, he joined the family business in 1926. He spent the next three years learning the trade, going from one workshop to another, to gain as much knowledge as possible about the various trades of the Etablissements Gallé. Bourgogne made extensive notes regarding his observations at every step of the glassmaking process. His recollections are therefore far more trustworthy than the much later accounts of various former workers in the Gallé factory. Among them was René Dézavelle, who stands out because he provided a written record of his 11 years (1919–1930, with an interruption in 1925)³⁷ as a painter on glass there. However, his account dates from 1974, more than 40 years after he was laid off, so its accuracy is in doubt, as many erroneous details reveal.

The new industrial apparatus was larger than before the war, but not much more so. As before, only one glass-melting furnace was active at any time, although a replacement furnace was built to take over after four or five years of service. Thus the furnace from 1922 lasted until 1927, and the new one fired that year was the last. It was shut down in 1930, never to be operated again. This was a recuperative gas-fired pot furnace, similar to the one employed before the war, but with six pots; the fire-clay containers served as melting crucibles housed inside the furnace. The furnace therefore had only two more pots than in

³⁵. Hakenjos [note 14], p. 106, n. 594.

³⁶. All of the technical information about the glassmaking process in the following pages came from this source.

³⁷. Dézavelle was employed from August 1919 to October 1930, with an interruption for military service in 1925. See Dézavelle [note 23], p. 35.

1914 (Fig. 20), so the increase in production was probably no more than 50 percent. This is confirmed by the number of glassblowers, who used six chairs, up from five before 1914 and only three during the war. Each chair was served by a team of six workers, led by the gaffer (*chef de place*) or senior glassblower, with the gatherer, a second blower (*grand garçon*), and three assistants (*gamins*) as young as 14 or 15. The municipal census of 1911 lists 34 glassblowers from the Gallé *halle de verrerie*.³⁸ They probably numbered only in the low 40s in the 1920s.

Paul Perdrizet commented on this rather reasonable growth in a speech given in November 1930 to honor Emile Lang, director of the factory, who was then awarded the Légion d'Honneur.³⁹ Perdrizet had envisioned some enlargement of the factory in the late 1920s, most notably after the drastic devaluation of the franc in 1928, and he praised Lang for putting the brakes on these projects. The global financial crisis of 1929 had proved him to be correct. Investments in the factory were still being made as late as 1930. One of them involved a new stand-alone building for the blower motors, but the volume of production remained limited by the capacity of the lone glass-melting furnace.

Compressed Air / Mechanical Blowing

Productivity significantly increased after the war, thanks to some technical changes in the workshops. Among them were the introduction of mechanical blowing and the widespread use of cast iron molds, the two innovations necessary for the creation of the mold-blown series.

Mechanical glassblowing was not a recent invention in the 1920s, but it was still sparsely used in the artistic glass industry. In 1882, Léon Appert and his brother had patented a system that employed compressed air for glassblowing, with or without a mold, for their glass factory in Clichy.⁴⁰ They published their invention in the magazine *La Nature* the following year, with several engravings illustrating their apparatus (Fig. 21).⁴¹ Their goals were to permit the blowing of larger pieces than were normally possible for a man and to lower, even eliminate, the health hazard resulting from this activity. Glassblowing was

³⁸. Registre de population de Nancy, Archives Départementales de Meurthe-et-Moselle, 6 M 33.

³⁹. Paul Perdrizet, [*Discours de remise de la légion d'honneur à Emile Lang*, November 22, 1930]. Archives Paul Perdrizet, Université de Lorraine, Nancy. There is a brief account of the ceremony in *L'Est Républicain*, November 24, 1930, p. 3.

⁴⁰. The first device for blowing with pressurised air was the "pompe Robinet," a manual pump invented by the glassblower Robinet at Baccarat in 1821 (see Alexandre Sauzay, *La Verrerie depuis les temps les plus reculés jusqu'à nos jours*, 2nd ed., rev. and enl., Paris: L. Hachette & Cie, 1869, pp. 147–148). For the Apperts' invention, see Anne-Laure Carré, "Une stratégie de valorisation de l'innovation: Léon Appert et le soufflage mécanique du verre," *Les Cahiers de Verre & Histoire*, no. 2, 2013, p. 402.

⁴¹. Frères Appert, "Le Soufflage du verre par l'air comprimé," *La Nature*, no. 527, July 5, 1883, pp. 87–91.

causing multiple respiratory diseases among the workers, sometimes extending even to the very young apprentices.

The Appert apparatus was simple enough. A nozzle, connected by a flexible tube to tanks of compressed air, was adapted to the blowing iron in various manners, according to the type of glassblowing. The Appert brothers presented four different kinds of setup, one of which had a gooseneck (*col de cygne*) shape (Fig. 22), allowing the glassblower to use it with a mold. For mold blowing, the gaffer had to stand in an elevated position, on a stool or a platform, above the assistant, closing the articulated mold around the parison. The gaffer then rotated the iron along a vertical axis in order to avoid leaving marks from the mold's joints on the glass : the nozzle had to be adapted on its upper end, and the tube distributing the compressed air was therefore raised vertically.

It is possible (but not necessary) that the Etablissements Gallé employed this same apparatus from the Appert Frères firm. Appert was their supplier for other glassblowing equipment during and before the war.⁴² But by 1920, other firms were providing this kind of hardware. According to Jean Bourgoigne, in 1926 and probably thereafter, only one of the six chairs was equipped with a mechanical blowing system. It consisted of a vertical tube that was probably similar to the Appert apparatus. When the time came to use it, the gaffer simply inserted the mouth of the blowing iron into the tube, engaging a spring that released the compressed air. This simple system permitted a fast transition from mouth blowing to mechanical blowing when work was concentrated on a large piece or a "Relief" vase. It countered the major criticism leveled at mechanical blowing: its lack of flexibility, which was probably one of the main reasons why only one chair was set up with this apparatus.

Significantly, the only chair equipped with mechanical blowing in the Gallé factory belonged to Julien Roiseux. He was both the most senior and the most talented glassblower since the time of Emile Gallé himself (Fig. 23). Born in Belgium in 1857 and French-naturalized in 1890, Roiseux had been a gaffer in the Parisse glass factory in Le Bourget, near Paris, in 1890–1891, before he joined the Cristallerie Emile Gallé in 1895. Following the departure of Joseph Burgun, the glassblower from Meisenthal who had been instrumental in setting up the Gallé glass factory, Roiseux was regarded as the true manager of the blowing and hot-working operations. He was awarded a silver medal in class 73 (*Cristaux et verreries*), at the Paris world's fair of 1900.⁴³ Twenty-five years later, he was still leading the glassblowers, and he probably continued to do so until the furnace was shut down late in 1930. He would thus have overseen the blowing of the "Relief" vases, but he certainly did not blow them himself, even with the assistance of mechanical blowing, because he was 68 years old in 1925.

⁴². Provost [note 1].

⁴³. François Le Tacon, *Émile Gallé, maître de l'Art nouveau*, Strasbourg: La Nuée Bleue, 2004, p. 258.

Bourgogne supplies the names of seven gaffers for the six chairs at that date. It is worth noting that five of them had been active in 1911: Edouard Tritschler (43 years old in 1925), Emile Krebs (53), Théodore Schmitt (59), Gustave Schweitzer (31), and Julien Roiseux. The war had seemingly changed little in the *halle de verrerie*. It is therefore not surprising to find Roiseux in charge of supervising the new series in the 1920s, especially because they were mainly large pieces.

Compressed air was produced by a rotary vane compressor operated by electric motors. At first, its use was primarily intended, not to power mechanical glassblowing, but to supplement the natural air supply for the gas generators of the main furnace and to feed the secondary burners. But when mechanical blowing was introduced, it soon became apparent that the air pressure obtained was insufficient for the larger molds, and especially for the relief molds. Another inconvenience was that the air had to be cut off in the secondary burners for the duration of the mechanical blowing. An independent air blower was then built to provide stronger air pressure: a Ledoux pump that was electrically operated from the floor of the glass factory. When he was ready to blow in the mold, the glassblower just turned on the pump, and then turned it off after he was finished. There was no tank to store the compressed air. The air pressure applied by this system to the blowing of larger pieces was from one to 1.250 kilograms per square centimeter above standard atmospheric pressure. By comparison, Appert had calculated that the maximum pressure obtained by mouth blowing was 0.150 kilogram per square centimeter, and only for a short period. Ordinarily, mouth blowing was delivering pressure between 0.005 and 0.030 kilogram per square centimeter.⁴⁴ Mechanical blowing therefore drastically increased the air pressure available, which was a necessity for the new cast iron patterned molds.

The Cast Iron Molds

In Emile Gallé's day, glassblowers were already using molds for all of their industrial series (Fig. 23). Regular glassblowing was largely reserved for the small series or unique pieces. Most of the molds were made from wood in a special workshop in the factory. They had a limited life span, even if they could be repaired. Their longevity depended on their shape and on the skill of the glassblower. A wooden mold could typically produce from 50 to 200 pieces, which was sufficient for most of the series made in the first decade of the 1900s. These traditional wooden molds continued to be used frequently after the war. Georges Vinnisdorfer, a locksmith by trade, was hired sometime before 1911 to craft them, and he remained busy in this pursuit into the late 1920s. He even had his own workshop in the factory.

Even in the early 1900s, the need for more durable molds led to the making of metal molds from cast iron or bronze. The latter was easier to work with, but it was also more expensive than cast iron, so it was rarely employed. Cast iron molds were also costly because they had to be commissioned from a foundry in Paris, where they were made from a

⁴⁴. Frères Appert [note 41], p. 87.

plaster mold. This expense was apparently one reason why the factory ceased producing table glasses soon after Emile Gallé's death: they required too many molds and were not profitable.⁴⁵ Dézavelle asserted that the glassmaker Delatte, active mainly in the 1920s and 1930s, did not use molds for his vases, hoping to contain their cost.⁴⁶ This anecdote holds at least some truth, in that the making of molds from cast iron (or even steel, in the case of Lalique) incurred significant expense. They were ordered only for new shapes with an anticipated long production run, thus affording a good chance of offsetting their cost.

There is no doubt that the strategic and commercial decision in favor of large industrial series after 1904 led to an increased use of cast iron molds. In the 1920s, the Gallé factory had a vast assortment of molds in different sizes, both for closed shapes, such as vases or bottles, and for open shapes, such as cups, candy boxes, and ashtrays. They were usually made from two or three articulated parts, and fitted with handles to open and close them. Only smaller objects came from a single-part mold. Cast iron molds had to be pre-fired with a blowtorch, until they were almost dark red, before they could be used. Otherwise, the difference in temperature between the glass and the metal would cool the former too quickly. Another major difference distinguished molds for round pieces from those for angular or irregular shapes. In making round objects, the glassblower turned the glass inside the molds, whose inner face was coated with powdered coal. This gave the glass a very smooth surface, as well as a more brilliant aspect. For angular or irregular shapes, no rotation was possible and greater air pressure was needed for the blowing to fill the mold.

The innovation in 1925 came not from the use of cast iron molds in general but from a new kind of sculpted molds. As François Le Tacon aptly remarked several times,⁴⁷ the "mold-blown" designation could technically apply to all of the industrial series from the 1920s, for they were all blown in a mold. The pieces commonly known today as "mold-blown" (*soufflé-moulé*)—that is, mechanically blown in a mold engraved with a decorative pattern—should properly be designated as "blown with molded decoration."

A simpler solution, perhaps, is to revert to the historical designation by the Etablissements Gallé: "Relief" vases or lamps. As the name implies, the new technique allowed the blown piece to acquire an intricate ornamental design from the mold itself, in a simpler and more efficient fashion than what could traditionally be achieved with additional work on the evenly and smoothly shaped forms from the undecorated molds. The inner surface of the cast iron molds was engraved with the negative of the desired ornaments: fruits, flowers, leaves, or even animals. These were first carved on a plaster replica, probably by Louis Léonard, the modeler shown in the Bernard engraving (see Figure 15). This

45. Letter from Henriette Gallé to Albert Dagueperce, March 13, 1904. Private collection.

46. Dézavelle [note 23], p. 91. André Delatte is an important but hitherto little studied glassmaker in Nancy between the two world wars: Olland [note 18], pp. 108-109.

47. François Le Tacon, "Les Techniques et les marques sur verre des Établissements Gallé après 1918," *Le Pays Lorrain*, v. 74, no. 4, October–December 1993, pp. 203–217.

customized work was done according to the replica in the Parisian foundry in charge of making the molds.

What set the Etablissements Gallé "Relief" vases apart from the mold-blown series by Lalique was the use of multicolored, multilayered crystal in combination with these engraved molds. In fact, these vases or lamps were a traditional industrial Gallé series, but with the added feature of higher relief than what was permitted by simple acid etching. The mold was the only change in the making of these new pieces. The parison was of the same type, and the initial blowing was still done by mouth, before the glass was introduced into the mold. Then, only air-compressed blowing was used to fully expand the glass inside the mold. After the piece had been annealed, the ornamental design was completed with acid etching, as in the past. The technical innovation was minimal, but the combination of high relief allowed by the engraved molds and traditional cameo engraving and color blending achieved by acid etching produced some rather spectacular results (Fig. 24). These pieces still looked much like the popular industrial Gallé series, but with the benefit of embossed features on the surface that captured the light.

To achieve the maximum effect from the relief, the decorative patterns were selected mainly from fruit-bearing trees, with plums, apples, oranges, and cherries the clear favorites (Figs. 25 and 26). There were a few floral designs (clematis, rhododendron, tulip, crocus; Fig. 27), some seashells and crabs, and the famous elephants, but no landscapes. The range of decorative themes used for these vases and lamps was therefore restricted to designs made to benefit from high relief.

The Place of the Relief Vases in the Gallé Product Line

Relief molds had a more limited use than their evenly shaped regular counterparts. The engraved decoration on the relief molds narrowed the range of possible ornaments within a given shape. The decorative pattern in relief on the surface of a molded vase was also somewhat limited in terms of possible colors, although vases such as the Calla (*Arum*) and the Plums were produced in several different hues. Blue oranges or apples, for example, were out of the question. This was not the case with the regular molds, which allowed the same shape to be adorned with many different patterns in many different colors—as can be seen, for instance, in the vast Gallé catalog of lamps.⁴⁸

Moreover, the difficulty and high cost involved in the making of relief molds impelled the Gallé firm to limit this technique to medium-sized objects (both lamps and vases), which were nevertheless more expensive than items of similar size fashioned in regular molds. Prices in the Etablissements Gallé series portfolio from 1927, which was certainly used as a sales catalog for the American market (and is now in the Rakow Research Library of The Corning Museum of Glass), show that while "Relief" vases were not the most expensive

⁴⁸ . Alastair Duncan and Georges De Bartha, *Gallé Lamps*, Woodbridge (Suffolk), U.K.: Antique Collectors' Club, 2013, pp. 94-233.

items available, they were at the higher end of the price range (Fig. 28). For two vases of comparable size, the "Relief" version cost about 20 to 30 percent more than an ordinary one. A vase 30 centimeters tall would sell for \$60, while its counterpart in relief would cost \$80. Another consequence is that "Relief" vases, while bigger than the average, were not the largest such objects available, because there would not have been a market extensive enough to justify their manufacture.

Of the 355 different items listed in the 1927 catalog, 266 are vases of various shapes and sizes, but only 14 are "Relief" vases: five different versions of the Plum design (two tall vases and three globular ones), two Clematis, and one each of Apples, Tomatoes, Mountain Ash (*Sorbus aucuparia*), Gooseberry (*Ribes grossularia*), Cucurbitaceae (two different kinds), Seashell, and Algae. All of these are of medium size (H. 19–39 cm), compared with dozens of series offering items six to 20 centimeters tall, and with many models between 45 and 60 centimeters tall. This is, of course, only one variable in determining the cost of a vase—and a crude one, for that matter. The number of crystal layers and of pattern layers (e.g., of acid baths) provided a more precise manner of determining the price. But in this period of standardized production, there was a close connection between the size of the vase, the complexity of its decorative design, and its price.

Not all of the "Relief" vases known today from the art market and museum collections are present in the 1927 sales catalog. The Arum and Elephants vases, for instance, are missing, as are other series (crab, tulip, and crocus vases, as well as cherry lamps). Perhaps these were considered ill-fitted to the American market, if indeed this album was a sales catalog specifically printed for exports to the United States, as the penciled prices in dollars suggest. Or perhaps they had been discontinued by that date. Other series may not yet have been created. Whatever the explanation, the impression of paucity given by this catalog is well confirmed by other sources. The now incomplete sales catalog of Pierre Perdrizet leads to the same conclusion, as do the auction catalogs and the few museum collections that include such works.

Assessing the total number of "Relief" pieces produced is an impossible task, given the lack of sales records and other unknowns. Only one chair was equipped to produce them, however, which means that these pieces could not have accounted for more than 16.7 percent of the production. In fact, this percentage was much smaller because Julien Roiseux's work involved more than blowing these pieces exclusively. But it was probably a little higher than the 3.9 percent (14 out of 355) suggested by the 1927 catalog, which gives only an estimate of the number of examples, not the overall quantities produced. At any rate, this resulted in thousands of pieces.

According to Dézavelle,⁴⁹ the larger vases were produced in no more than 10 to 12 copies, while the smaller objects, such as candy boxes and small vases, were replicated in series of 20 to 30 objects. The latter figure seems to be very conservative, but the former one

⁴⁹ . Dézavelle [note 23], p. 27.

is certainly possible for the most prestigious pieces. Another important source of information is the July 1925 inventory of the factory. A complete analysis is beyond the scope of this article, but with 17,275 items in 41 categories, this inventory certainly suggests that many series were produced in hundreds of copies, while the higher-end items numbered tens of copies. Finally, this large inventory in a period of commercial success is probably an indication that the total production annually was well above 30,000 pieces.⁵⁰

To summarize, the high cost of the engraved cast iron molds, the limited use of compressed air in the factory, and the relatively small range of designs available to take advantage of this new technique were probably the main factors restricting the production of "Relief" pieces. Another factor was the rather short production run of less than six years (late 1925–1930), compared with the longevity of the common floral or landscape series, some examples of which were produced over a period of 10 to 15 years, and perhaps longer. This was a spectacular attempt to modernize the Gallé product line: by borrowing a popular technique from contemporaneous industrial glass production, while maintaining the general style for which the firm was known. But it was both too little and too late. It is perhaps telling that the last large prestige pieces produced by the Etablissements Gallé are not "Relief" vases: the Sea Gull and the Polar Bears, designed about 1927, did not reprise this technique, probably for cost-related reasons or because the "Relief" vases had failed to meet commercial expectations.

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⁵⁰ . This production level had already almost been attained in 1913, given the gross sales figure for that year (1,137,000 francs) and the known average price (about 40 francs). For an estimate of the production volume before 1914, see Provost [note 2], pp. 361–363.

FIGURES



FIG. 1. Jean Roupert, advertisement for the Etablissements Gallé, 1920. Private collection.



FIG. 2. Mold-blown vases, about 1925-1930, from sales catalog of Pierre Perdrizet, Private collection.

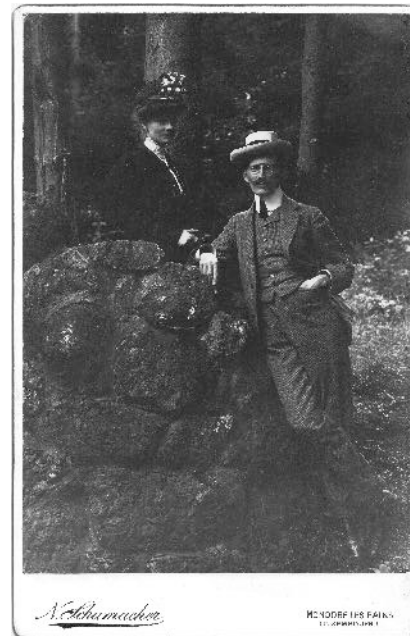


FIG. 3. German eagle and thistles, multilayered acid-etched glass. Etablissements Gallé, 1915. Collection of the Palais des Ducs de Lorraine, Musée Lorrain, Nancy, © Fabrice Gousset.

FIG. 4. Paul Perdrizet and Lucile Gallé during their honeymoon in Luxembourg, August 1906. N. Schumacher. Private collection.



FIG. 5. Etablissements Gallé packing room, about 1928. Private collection. Pierre Perdrizet is standing at back, left, before the desk. Several mold-blown vases, as well as a crackled glass vase and a *Lac de Côme* vase, are visible on the table and the shelves.

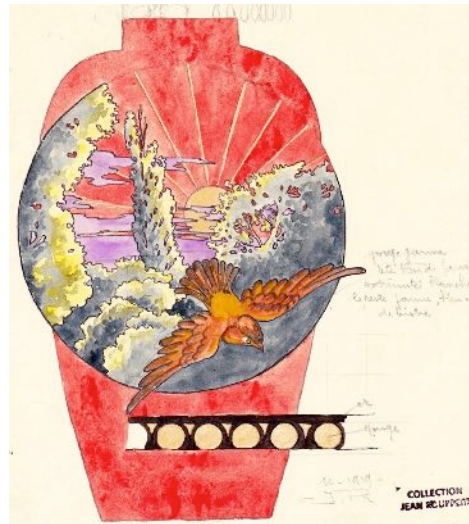


FIG. 6. Gallé family in the avenue de La Garenne residence's garden in Nancy, about 1918. Private collection. *Left to right*: Claude Gallé, Jean Bourgogne, Thérèse Bourgogne, Lucien Bourgogne, and Lucile Perdrizet.

FIG. 7. Vase, watercolor. Jean Rouppert, 1919. Private collection. An example of this vase, from the Funke-Kaiser Collection, is in the Kunstgewerbemuseum, Cologne (listed with an incorrect date).

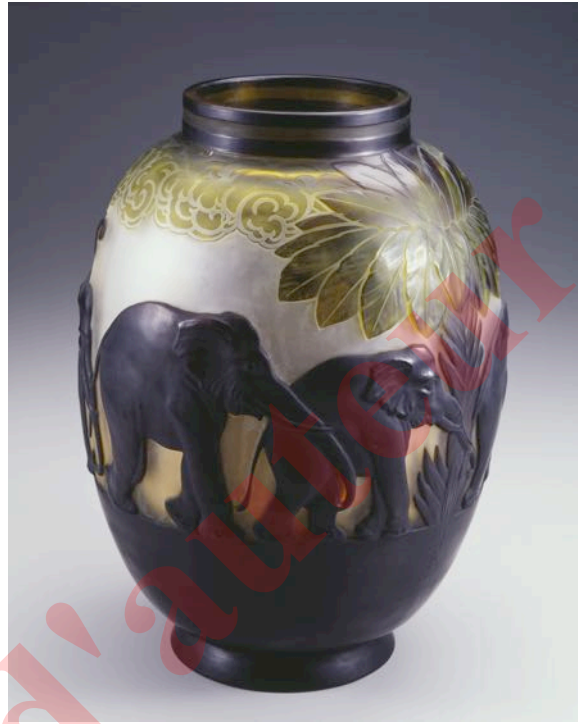
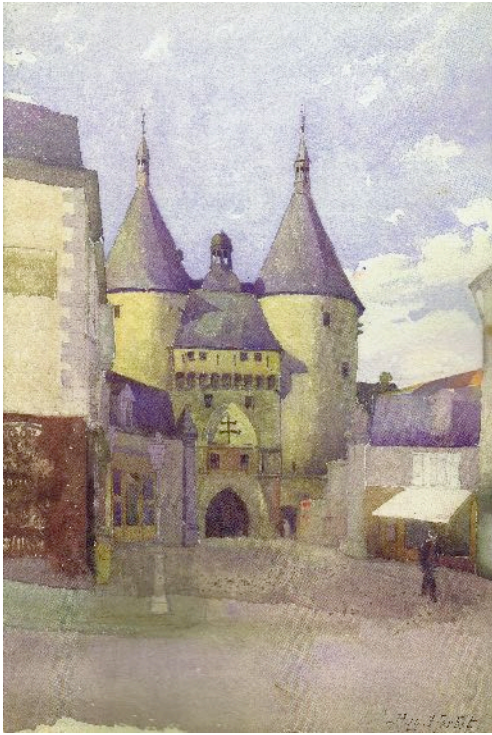


FIG. 8. *Porte de la Craffe*, watercolor. Auguste Herbst, undated. Private collection. This Nancy landmark was illustrated on vases, as well as in marquetry, from 1900 to the 1910's, when Herbst was one of the main artists in the Etablissements Gallé.

FIG. 9. Elephants vase, greenish brown version. Etablissements Gallé, about 1925. Collection of the Kitazawa Museum of Art, Japan (inv. no. 14436, GC-31).

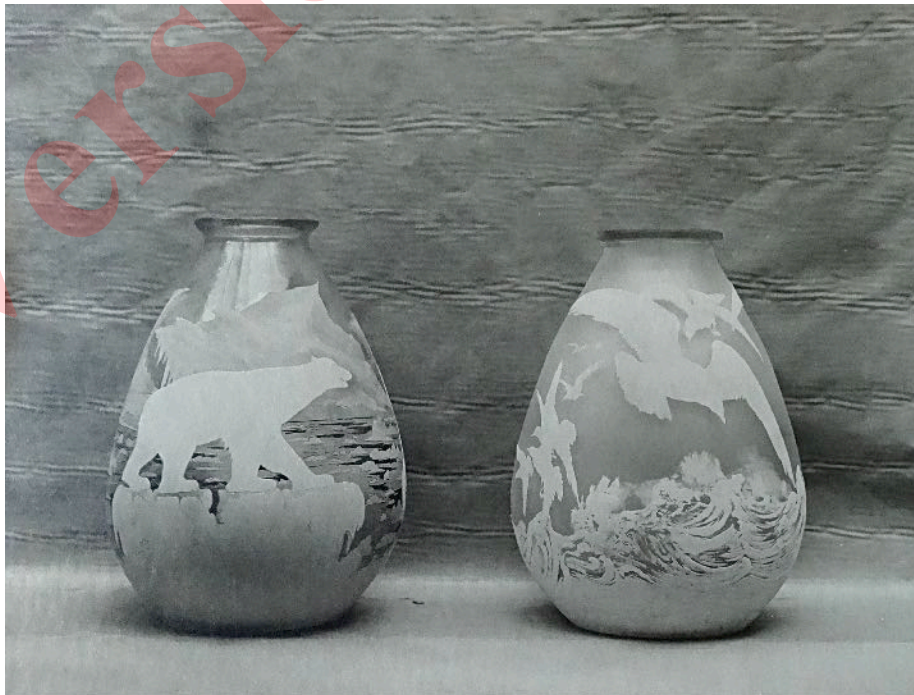


FIG. 10. Sea Gull and Polar Bears vases. Etablissements Gallé, photo from the Perdrizet sales catalog, about 1928–1932. Private collection.



FIG. 11. Elephants vase, ivory-colored version. Etablissements Gallé, about 1925. © Pierre Aubert Photographie-Maison de vente Art Auction France-Plaisance Baron.

FIG. 12. (1) Ivory on yellow Elephants vase and (2) mold-blown Plums vase in the Etablissements Gallé packing room. Detail of an undated photograph, about 1927. Private collection.

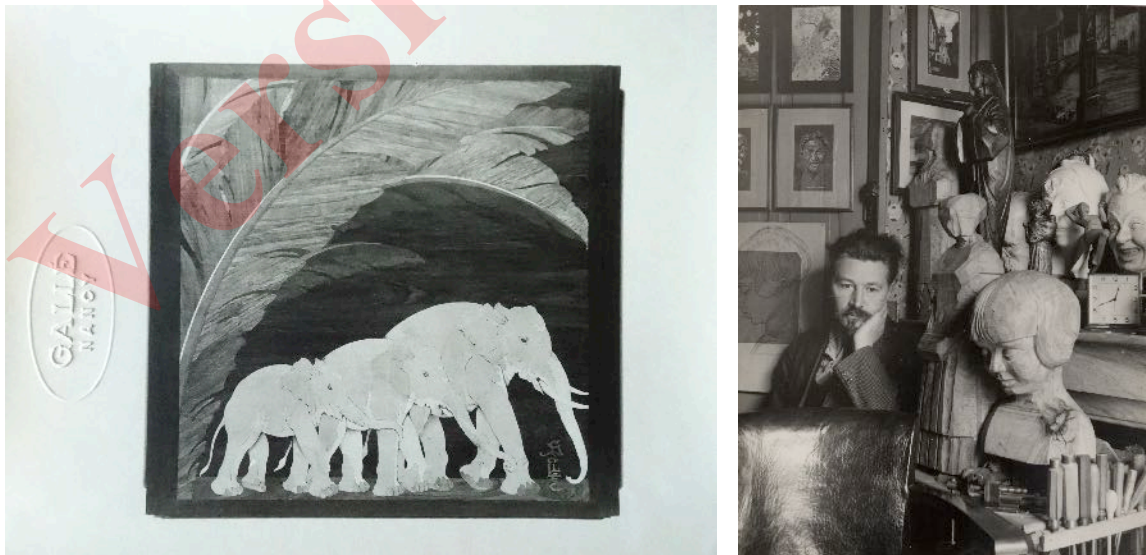


FIG. 13. Elephants marquetry on square table. Etablissements Gallé, photo from the Perdrizet sales catalog, about 1928–1932. Private collection.

FIG. 14. Jean Rouppert in his studio, 1935. Private collection.



FIG. 15. Reception for the aviator Marc Bernard and his wife by Paul Perdrizet and the principal employees of the Etablissements Gallé, May 12, 1927. Private collection. *Left to right:* M. Machin (designer), Georges Dethorey (designer), Théodore Ehrhart (designer), Emile Lang (factory director), Marc Bernard and his wife, Eugène Rousselot (packing room manager), unknown man, Paul Perdrizet (administrator), unknown man, Louis Léonard (modeler and designer), and Auguste Herbst (artistic director).



FIG. 16. Portrait of Auguste Herbst in the 1950s, undated. Private collection.

FIG. 17. Starfish vase. Auguste Herbst, undated. Damien Boyer © Musée de l'Ecole de Nancy fonds Herbst, inv. 2014-10.



FIG. 18. Polar Bear vase.
Etablissements Gallé, about
1928. Glasmuseum Hentrich,
Düsseldorf (P 1977-25).



FIG. 19. Sketch of polar bear for letter-holder. Auguste Herbst, undated (after 1931). Damien Boyer © Musée de l'École de Nancy, fonds Herbst, inv. 2014-197.



FIG. 20. Main furnace of Gallé glassmaking factory, with four pots, 1911. Private collection.

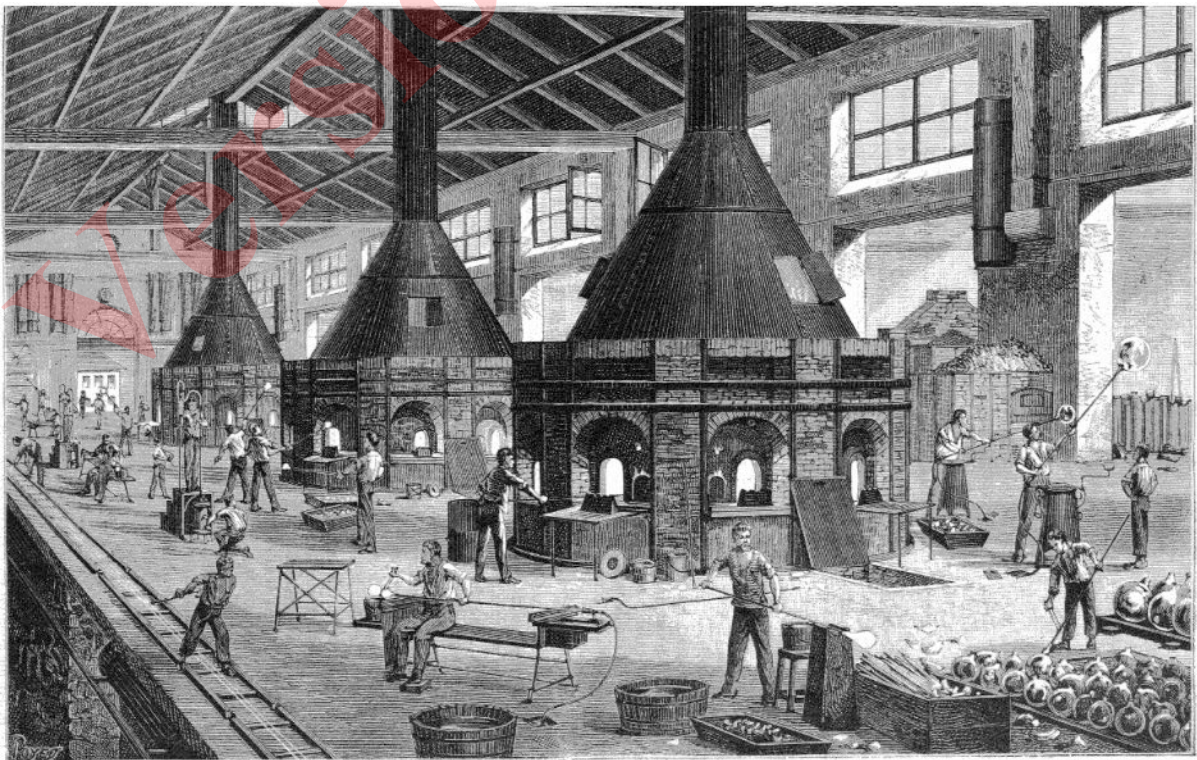


Fig. 4. — Vue d'ensemble de la verrerie de MM. Appert frères, montrant le travail du nouveau procédé de soufflage du verre par l'air comprimé. A gauche, sous le sol, on a représenté les cylindres accumulateurs avec leur canalisation.

FIG. 21. Mechanical glassblowing in Appert glassmaking factory, Clichy. Appert [note 41], fig. 4.

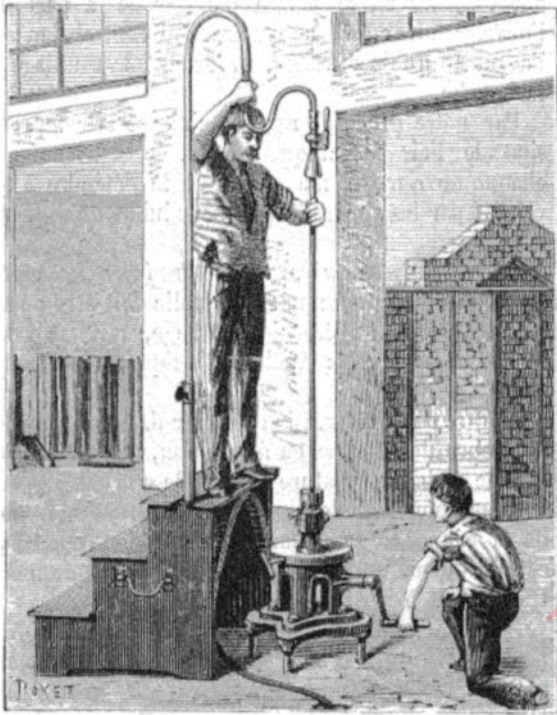


Fig. 2. —Appareil pour moulage par l'air comprimé.



FIG. 22. Appert gooseneck glassblowing tube. Appert [note 41], fig. 2.

FIG. 23. Julien Roiseux (*third from right*) directing the blowing of a vase in a mold, in front of Emile Gallé (*second from right*) and Emile Lang (*right*), about 1895. Private collection.



FIG. 24. Rhododendron "Relief" lamp. Etablissements Gallé, about 1925. Collection of the Kitazawa Museum of Art, Japan (inv. no. M10156, GC-55).



FIG. 25. "Relief" series (three Plums vases, one Clematis vase). Etablissements Gallé sales catalog, September 1927, pl. 40. Rakow Research Library, The Corning Museum of Glass (bib. no. 55138).



FIG. 26. "Relief" series (Tomatoes, Cherries, and Apples vases). Etablissements Gallé sales catalog, September 1927, p. 53. Rakow Research Library, The Corning Museum of Glass (bib. no. 55138).



FIG. 27. Arum (Calla) "Relief" vase. Etablissements Gallé, about 1925. Glasmuseum Hentrich, Düsseldorf (P 1977-20).

FIG. 28. Distribution of vases and lamps according to height and price, from Etablissements Gallé sales catalog, 1927. Rakow Research Library, The Corning Museum of Glass (bib. no. 55138).

