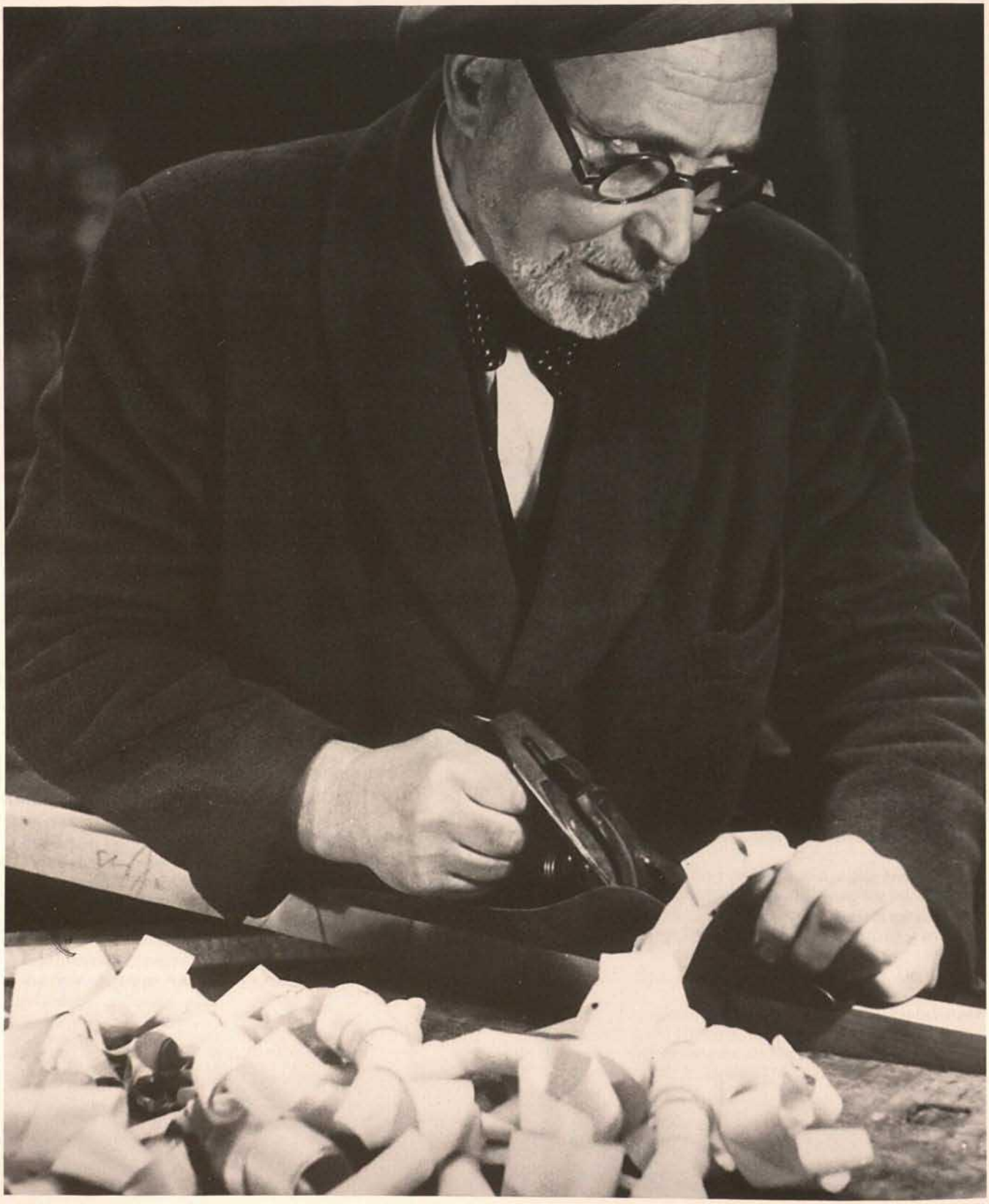


Fig. 1. Jean Dunand shortly before his death in 1942, planing wood

Mechthild Baumeister

Jean Dunand – A Master of Art Déco Lacquer

Jean Dunand was one of the most renowned French Art Déco artists, creating lacquer furniture and decorative objects that exemplified the sophisticated taste of his time. His innovative combination of traditional Oriental lacquer techniques with contemporary forms and abstract decorative designs established his international success.

Dunand's development as a lacquer artist is remarkable, especially considering that he was one of the first Western artists working with urushi. Born on May 20, 1877 in Lancy, Switzerland, Dunand started his artistic and crafts-oriented training at the age of 14 at the École des Arts Industriels in Geneva, completing his studies in 1896 with a degree in sculpture and design.[1] The city of Geneva granted the talented young artist a stipend to continue his training in Paris, where Dunand studied with the art nouveau sculptor Jean Dampt. Influenced by Dampt, who believed that a sculptor should also be a good craftsman, Dunand spent his summer vacations as an apprentice to a Geneva coppersmith. There he learned the traditional metalworking techniques for making household wares of hand-beaten copper and brass, known as Dinanderie.[2] Although Dunand found success as a sculptor, participating in major exhibitions of his time, such as the Exposition Universelle 1900 in Paris, commissions for carved furniture and interior decorations demonstrated to him the economic advantages of the applied arts. Consequently, he focused on his decorative metalwork and established himself as a Dinandier. It was in this context that he first experimented with coatings to prevent corrosion. He noticed that the Japanese metal vases sent to his workshop for restoration had a lacquer surface, that was not only protective but added a decorative effect. Fascinated by the Oriental lacquer technique and eager to apply it to his own metalware, Dunand invited several Parisian lacquer specialists to his studio to learn from them the secret of lacquer work. He was astonished by their lack of knowledge and considered them simply varnishers.[3] Pursuing his keen interest in this matter, he then contacted the Japanese lacquer artist Seizo Sugawara, who himself was interested in Dunand's metal working techniques. They agreed to exchange their workshop secrets.

Seizo Sugawara came from the small village of Johoji in the north of Japan, which is famous for its lacquerware. In 1900, at the age of eighteen, he arrived in Paris as part of the Japanese national delegation to the Exposition Universelle, to oversee the lacquerware sent from Japan.[4] Sugawara decided to settle in Paris, where he became an important figure in the art scene, teaching Western artists the Oriental lacquer technique. Dunand and the Irish artist Eileen Gray were his most prominent students.

The thirteen lessons Sugawara gave to Dunand in 1912 are documented in Dunand's personal notebook.[5] He recorded descriptions for preparing the lacquer, the tools and materials, the working procedure, and various decorative techniques, including their Japanese names. The interpretation of Dunand's notes, especially the Japanese terminology, is made easier by comparison with the extensive documentation of Johannes Justus Rein and John James Quin, who independently studied the traditional lacquer techniques in the late 19th century in Japan.[6] Working on behalf of the Prussian government, Rein presented one hundred sample boards and an accompanying report to the Königliche Kunstgewerbemuseum in Berlin in 1874.[7] Quin was commissioned by the British government to collect specimen and tools for the new Museum of Economic Botany at the Royal Botanic Gardens in Kew. By 1882 he had assembled an instructive collection of 170 items, including raw materials and tools, sample boards and objects demonstrating all stages of lacquering and decorative techniques, as well as finished lacquerware.[8] Both reports describe in detail the cultivation of the lacquer tree *Rhus vernicifera*, the extraction of the tree's sap, the refining of the lacquer, the lacquering procedure and traditional techniques of decoration.[9]

Dunand's notes and the sample boards he made during the lessons with Seizo Sugawara reflect the traditional Japanese lacquer technique. The type of lacquer most frequently noted by Dunand is 'Sessimé', which, according to Rein, is a purified, filtered and evenly flowing raw lacquer, rather than the lower quality lacquer by the same name obtained from branches.[10] Dunand describes 'Nashizi' as a high grade transparent lacquer and 'Schuaye', an oil-containing lacquer for use in ordinary and colored lacquerware.[11] Besides heat, Dunand mentions the addition of camphor for thinning and glycerin for thickening the lacquer.

The wooden sample boards made by Dunand during Sugawara's lessons demonstrate a 30 step process of producing a black lacquered surface (figs. 2 and 3). Following ten ground layers of 'Kekso', 'Sessimé', 'Ita', 'Kiriko', 'Dzinoko' and 'Sabi' (the components of which vary from layer to layer and contain different proportions of powdered burnt clay, finely ground clay, chopped hemp or cotton fibers, cloth, 'Sessimé', rice starch and water), three layers of black 'Louero' lacquer were applied and finished with two coatings of 'Sessimé'.[12] Between each application the dried layer was smoothed or polished with a stone, charcoal, finely ground clay, or powdered calcined deer antler.[13] Sugawara must have emphasized the importance of this procedure to Dunand, as indicated by this comment from the notebook: 'Lacquerers who do not know very well how to polish and smooth lacquer with charcoal are called camels, because a camel has two humps, similar to badly polished lacquer'.[14] Dunand describes the 'Louero' lacquer, called 'Ro-iro urushi' in Rein's terminology, as the highest quality black lacquer. It is obtained by the reaction of urushi with iron. A solution of iron filings in vinegar is added to 'Sessimé' and then the lacquer is heated and filtered.[15] In addition, he mentions 'Yuyen', a 'Nashizi' lacquer mixed with lamp black, and a lower grade 'Jôhana' lacquer, which contains oil and is blackened with iron powder. Dunand pointed out that oil-containing lacquers, such as 'Schuaye' and 'Jôhana', used for ordinary lacquer articles were never polished.[16] For colored lacquers various pigments were added, vermilion ('Schu') and iron-oxide ('Benigara') for red lacquer, cadmium and chrome yellow for yellow lacquer,

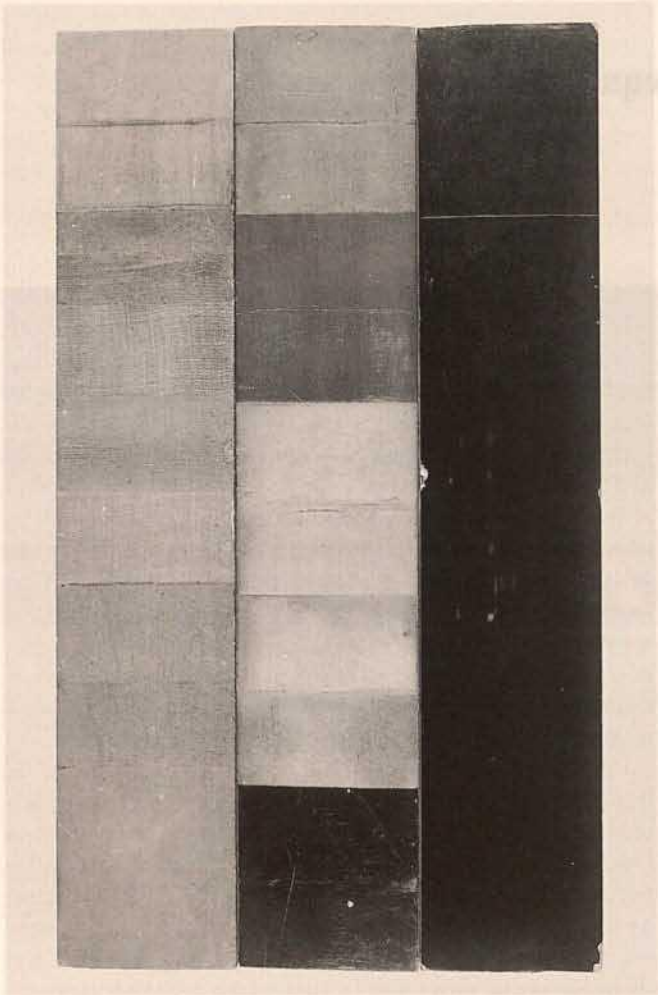


Fig. 2. Sample boards produced by Dunand during lessons with Sugawara in 1912

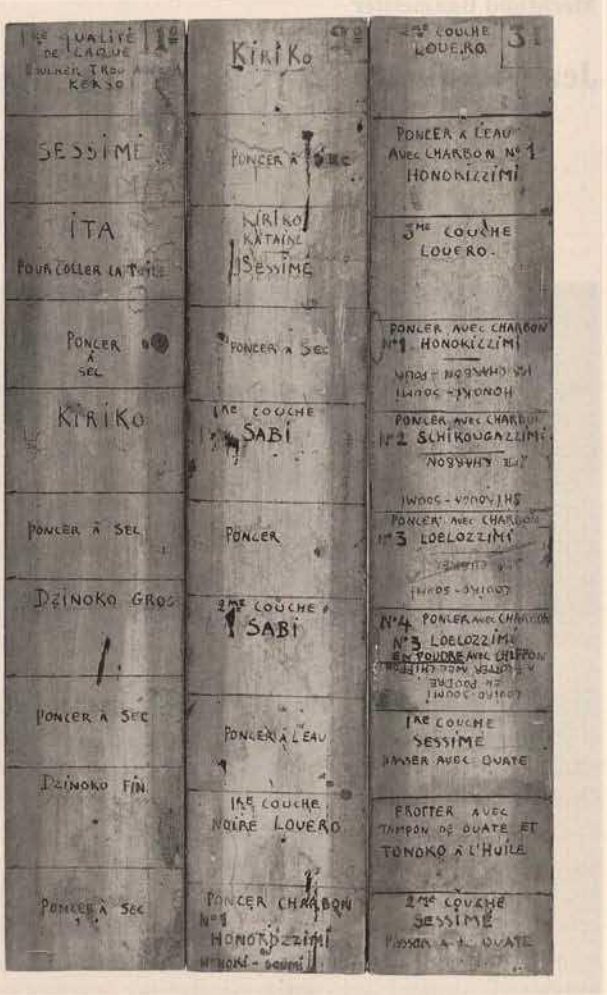


Fig. 3. Backside of sample boards listing the 30 steps for producing a black lacquered surface

Prussian blue for blue lacquer and barium sulfate, lead and zinc white as white colorants. Green lacquer was obtained either from a mixture of yellow and blue pigments or chromium oxide. Brown was achieved by mixing red 'Schu' and black 'Jôhana' lacquer. Sugawara also taught Dunand the application of gold lacquer, which incorporates metal leafs and powder, as well as other decorative techniques. Dunand noted the importance of a dust free environment for the drying of lacquer and that the lacquered object was placed in an armoire. However, he did not comment on the high relative humidity level required for curing lacquer. The use of 'Sessimé' on metal was specifically addressed and special mention was made of the fact that the lacquer applied to metal can be hardened in an oven.[17]

The lessons took place over a period of two months, which can only be considered a crash course.[18] They provided Dunand with an introduction to the Japanese lacquer technique, leaving this immensely talented craftsman with a new fascination that sometimes took on the air of a veritable obsession. When the lessons were completed Dunand continued experiments on his own. After World War I he proceeded with the installation of a lacquer studio in his workshop, located in the Rue Hallé in the fourteenth arrondissement in Paris. He obtained the lacquer from the French colonies in Indochina (now Vietnam), and most of the craftsmen who helped him with the lacquer work in his studio were also Indochinese. In a magazine interview of the early 1920s Dunand explained that he favored Asian assistants because they were experienced in working with lacquer and were not susceptible to the allergic reaction to urushi common among Europeans.[19] The 1920s and 1930s were Dunand's most successful and creative period; lacquer had become the integral element in his artistic oeuvre.[20] René Gimbel, a Paris based art dealer who visited Dunand in his studio on June 8 in 1920 copied Dunand's description of lacquer in his diary: 'Of course there are some art forms which are merely a matter of patience, like the lacquer which I love so much! Just look, and think how much work goes into preparing this stuff and making it. Here you have some trial attempts. On these tablets you can see the various stages of preparation. At the bottom, the first layer of lacquer, then comes the second, and at the top the twentieth. So you have to varnish or paint twenty times – or rather forty, as the

job has to be repeated on the other side to keep the wood from warping; otherwise it would crack, for you wouldn't believe how easily the lacquer can twist even the hardest wood into a semicircle. Actually, not forty but as many as a hundred preparations are required, since after varnishing you have to polish and before each varnishing there have to be twenty seasonings, each lasting four days. It'll surprise you to learn that the seasonings require damp conditions, and a dark room where water flows continuously, and that success is more certain at the full moon. So you'll understand that it's positively Oriental labor!'[21]

In his lacquerware Dunand combined traditional techniques with bright colors and modern forms, as well as abstract and figurative designs. Always searching for new applications and expanding the repertoire of his techniques, Dunand applied lacquer to furniture, wall panelings, paintings, portraiture, metal vases, jewelry, and textiles (fig. 11). His extraordinary creativity and his indefatigable stamina lead to an enormous production of lacquerware in the Dunand workshop.

Dunand participated in important art exhibitions of his time. His work was widely shown throughout Europe and the United States and it was acquired by major museums. In 1998 the Metropolitan Museum of Art mounted a small Jean Dunand exhibition showing works drawn mainly from its own collection.[22] This exhibition provided a welcome opportunity to study Dunand's lacquer techniques.

One of the most impressive interiors by Dunand was realized in 1928 for the penthouse of Templeton Crocker, the wealthy grandson of the founder of the Union Pacific railroad company, in San Francisco. Crocker's attention was drawn to Dunand's lacquer work by two exhibitions of contemporary French design shown in the mid-twenties in San Francisco. He commissioned a master bedroom, a dining room, and a breakfast room, all of which were decorated with lacquer.[23] The bedroom furniture is now in the collection of the Metropolitan Museum. The bedroom walls were originally decorated with lacquered panels, depicting a forest landscape (fig. 4).[24] The lacquer surface of the

Fig. 4. Bedroom by Dunand made for Templeton Crocker in 1928. The photograph was taken in 1928 in Paris before the room was shipped to San Francisco

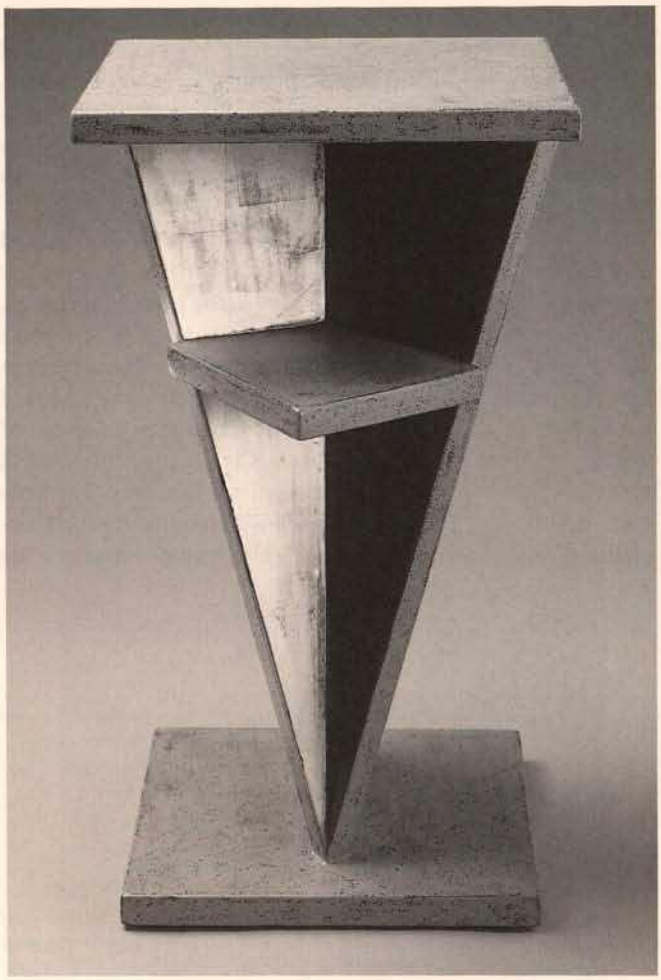


Fig. 5. Bedside table by Dunand from the bedroom made for Templeton Crocker. The Metropolitan Museum of Art, New York, Gift of Mr. and Mrs. Peter M. Brant, 1977 (1977.226.7)

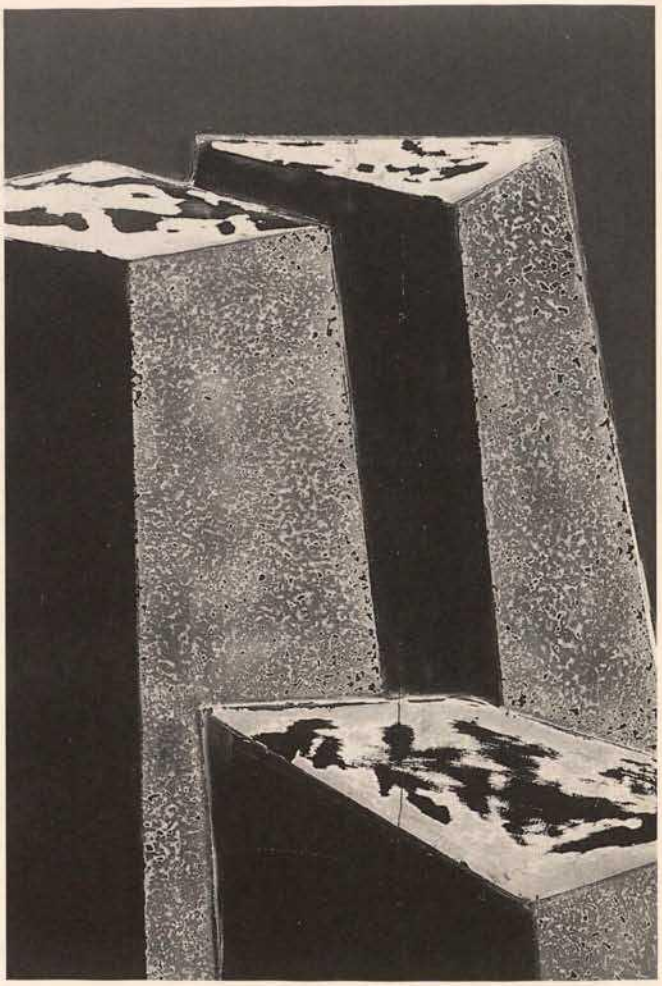


Fig. 7. Detail of 'Fortissimo' screen (cf. colour plate XXIII.5) showing the geometrically abstracted rocks

Fig. 6. Cross section of the mottled lacquer from the bedroom table, showing black laque arrachée applied to the ground layers and filled with a silver-gray lacquer. Microscopic magnification 50 x

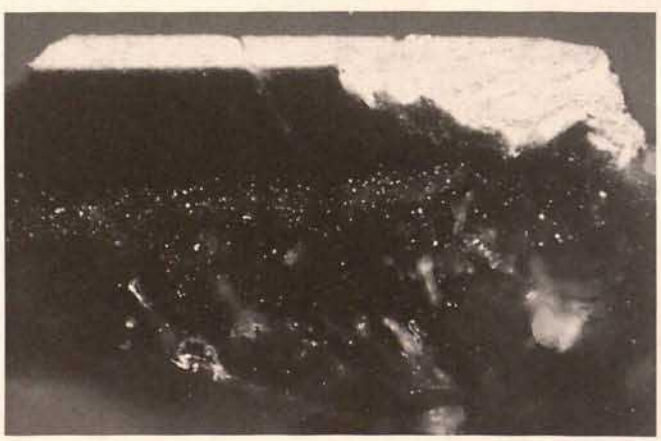
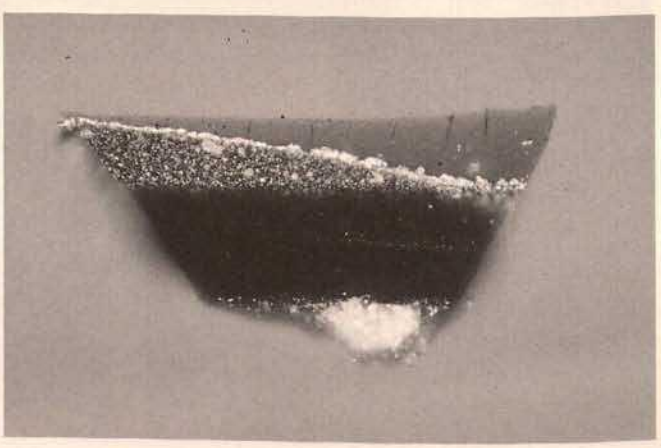


Fig. 8. Cross section of marbled side of rock showing black lacquer on ground layer, followed by an unevenly applied pigmented lacquer, which is covered with gold leaf fragments. The irregularities of the surface were filled with a transparent lacquer. The finishing layers vary in thicknesses and continuity, thus creating the speckled appearance of the illuminated side of the rock



furniture features mainly 'laque arrachée', a favored technique of the Dunand workshop in which the freshly applied lacquer was lifted with a flat wooden spatula creating an uneven surface (figs. 5 and 6). In this case the 'laque arrachée' consists of a black 'Louero' lacquer applied to the ground layers.[25] After drying, the surface was lightly smoothed and a silver-gray colored lacquer was applied over the black layer. The metallic effect of this layer was achieved by the addition of aluminum filings mixed with titanium white and cadmium yellow pigments to the lacquer.[26] Surface polishing revealed the raised peaks of the black lacquer within the silver-gray layer, resulting in a mottled effect. Plain silver-leafed and black 'Louero' lacquer were used to accentuate the shape of the furniture, providing a playful contrast to the mottled surface. The analysis of samples from the black and silver-gray lacquer indicated the presence of laccol, a substance found in urushi derived from the lacquer tree *Rhus succedanea*, which is native to Indochina, the present Vietnam.[27] This species is related to *Rhus vernicifera*, which grows in Japan and China and from which an urushiol-based lacquer is obtained.

'Laque arrachée' is the final surface decoration on a series of pictorial wall panels entitled 'Les peuples d'Asie et d'Afrique', which Dunand made for the 1931 Exposition Coloniale in Paris (figs. 9 and colour plate XXIII.4).[28] In this case the uneven texture of the matte brown 'laque arrachée' creates a striking contrast with the smooth and silver-leafed background. Records of a 'laque arrachée' sample board made in Dunand's workshop in 1931 describe the technique as follows: 'On a dried lacquer with gold leaf apply a coat of laque arrachée mixed with clay and draw the design in the freshly applied lacquer. After drying sand lightly with fine sandpaper.'[29]

More elaborate is Dunand's lacquer decoration on a pair of screens 'Pianissimo' and 'Fortissimo', which were made for the music salon of Mr. and Mrs. Solomon R. Guggenheim's residence in Port Washington on Long Island (colour plate XXIII.5).[30] Fabricated in 1925-26, the screens are signed by Dunand and his collaborator on this project, the sculptor Seraphin Soudbinine. The latter was most likely responsible for the design and for carving the relief figures of the angels and the geometrically abstracted rocks. The angels are decorated with an unusual gold-leafing applied to a red vermilion lacquer, juxtaposing smooth and wrinkled metal leafs, creating respectively, shiny and matte effects.[31] Differences in shading in the wrinkled gilding of the angels are achieved by the application of a coating to the darker areas rather than the use of gold leafs with different alloys.[32] The marbling of the towering rocks is achieved by a complex stratification, as illustrated by the cross section of a sample taken from an illuminated side of a rock (figs. 7 and 8). The black 'Louero' lacquer on top of the ground layer represents the side of the rock in shadow and appears as the darkest color in the marbling. A brown, pigmented layer was applied unevenly to the black lacquer and is covered with fragments of metal leaf. The irregularities were filled with a transparent lacquer and the surface was polished until the desired marbled appearance was obtained. Crushed eggshells were used to produce a white lacquer, a color otherwise difficult to achieve due to the dark natural tone of urushi. On the screens crushed eggshells were employed in combination with mother-of-pearl particles to represent the spiral-shaped clouds within the dark blue-green lacquered background, and in the gold lacquer of the angels' drapery.[33]

A technique first introduced by Dunand, which became a specialty of his workshop was the use of crushed eggshells to cover large surfaces. A drop-leaf table from ca. 1925 in the collection of the Metropolitan Museum serves as an example (colour plate XXIII.1). Depending on the desired effect, the eggshell was placed on the freshly applied lacquer either with its convex or concave side facing up. In the latter case the cavities were subsequently filled with lacquer, while in the former the convex eggshell appears mainly white after polishing. The chequered pattern of the table top and drop-leafs is achieved in this manner (fig. 12). The crushed eggshells were selectively positioned on a lacquer ground. Afterwards a grayish lacquer was applied, filling the hollow spaces of the concave eggshell particles and thereby creating a contrast to the adjacent predominantly white eggshell fields showing their convex side facing up. The grayish lacquer also filled the gaps in between the eggshell particles, thus enhancing the craquelure pattern of the eggshell mosaic. Viewing the cross section of an eggshell particle with its con-

Fig. 9. Wall panel from the series 'Les peuples d'Asie et d'Afrique', 1931, Musée des Arts d'Afrique et d'Océanie, Paris

cave side facing up under the fluorescence microscope indicated that the smoothed surface received a final coating of transparent lacquer (colour plate XXIII.2, 3).[34] Dunand's eggshell lacquer became so popular that he maintained a chicken coop in the courtyard of his workshop to guarantee a steady supply of eggs. In order to create different shadings and color contrasts, Dunand also incorporated eggshells of ducks, partridges, and exotic birds.

In a similar way, Dunand also experimented with embedding dried lacquer particles into a freshly applied lacquer, generally of a different color. The dried lacquer was obtained by applying a layer of a colored lacquer to a sheet of paper and heating it in an oven. After removing the paper, the dried lacquer was broken into pieces of the desired size.[35] Sieves with different gauge mesh were used to separate different particle sizes. Dried lacquer particles were also ground to produce a lacquer powder, which was sprinkled on freshly applied lacquer surfaces.

Another technique frequently used in the Dunand workshop was the so-called 'Coromandel' lacquer, in which the lacquered surface was engraved and the incised designs revealed the ground layers, which were either left exposed or were covered with colored lacquers. This technique was mainly applied to screens and wall panels, because 'Coromandel' lacquer provided a relatively simple technique for decorating large surfaces.

Dunand seems to have been more interested in the technical challenges and craftsmanship involved in the surface decoration with lacquer, rather than in the design itself, as indicated by his numerous collaborations with other artists and furniture designers, such as Jean Goulden, Paul Jouve, Seraphin Soudbinine, Jean Lambert-Rucki, Gustave Miklos, Émile-Jacques Ruhlmann, Eugène Printz, and Pierre Legrain. Dunand either executed the pictorial sketches in lacquer or he decorated the surfaces of sculptures and unfinished furniture sent to his workshop. Émile-Jacques Ruhlmann, one of the most important French Art Déco furniture designers, created the 'Chinoise' vanity in ca. 1929 (fig. 13). The dressing table was produced with different finishes, including plain black lacquer, and black lacquer with an abstract eggshell decoration, both executed in Dunand's studio.[36] Dunand's fascination with lacquer and his identification as a lacquer artist is also illustrated by his signature: 'Jean Dunand Laqueur', with which he often signed his work.[37]

Dunand continued to experiment with new ways of using lacquer. Among his most unusual applications were his portraits, which he based on his own photographs and sketches.[38] One of the portraits, in the collection of the Metropolitan Museum, shows Madame Juliette de Saint Cyr (fig. 10). Painted in ca. 1925 it features an eggshell mosaic background and a *laque arrachée* border containing a floral ornament. The fabric of Mme de Saint Cyr's abstractly patterned dress and her jewelry originated from Dunand's workshop as well. Mme Agnès, an influential Parisian milliner and member of the avantgarde had introduced Dunand to the fashion world and encouraged him to experiment with lacquering fabrics and producing jewelry, as well as other fashion accessories with colored geometric decorations in lacquer.

Farbtafel XXIII / *Color Plate XXIII* ▷

1 Drop-leaf table by Dunand, ca. 1925. The table top and drop leafs are decorated with crushed eggshells, arranged in a chequered pattern. The Metropolitan Museum of Art, Gift of Mr. and Mrs. Michael Chow, 1986 (1986.400)

2 Cross section of eggshell with concave side facing up from table top (cf. 1, fig. 12), filled with grayish lacquer and coated with transparent lacquer. Visible light, microscopic magnification 50 x

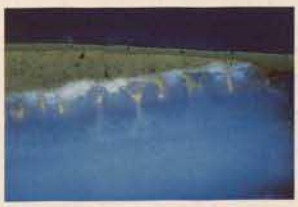
3 Fluorescence of same cross section (2). UV light, microscopic magnification 50x

4 Detail of wall panel from the series 'Les peuples d'Asie et d'Afrique', Musée des Arts d'Afrique et d'Océanie, Paris, showing the use of matte brown laque arrachée as the final surface decoration, here accentuated with gold leaf to represent ornamental buttons

5 Fortissimo' screen by Jean Dunand and Seraphin Soudbinine made in 1925-26 for Mr. and Mrs. Solomon R. Guggenheim. The Metropolitan Museum of Art, New York, Gift of Mrs. Solomon R. Guggenheim, 1950 (50.102.4)

△ 1

△ 2



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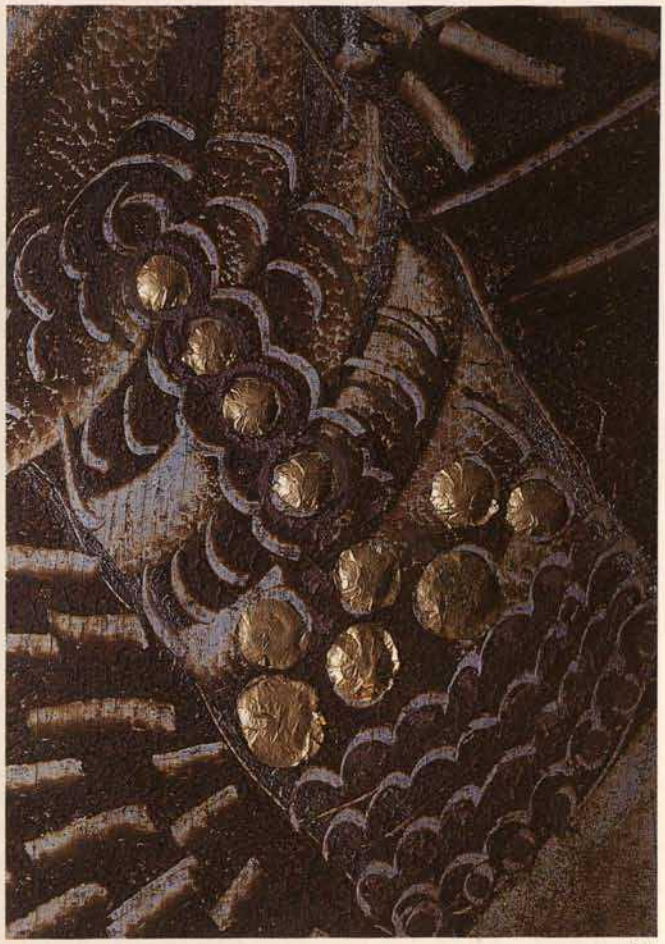

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Fig. 10. Portrait of Juliette de Saint Cyr by Jean Dunand, ca. 1925. The Metropolitan Museum of Art, New York, Bequest of Marquise Raoul de Saint Cyr, 1989 (1989.176.2)

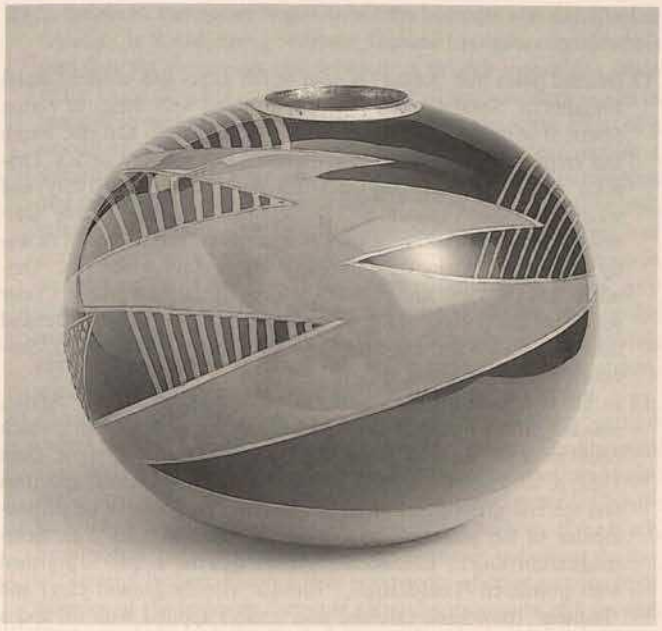


Fig. 11. Front of lacquered metal vase by Dunand, ca. 1925. The abstract geometric decoration was created with red and silver lacquer, applied to the black lacquered vase. The Metropolitan Museum of Art, New York, Purchase, Lita Annenberg Hazen Charitable Trust Gift, 1998 (1998.194)

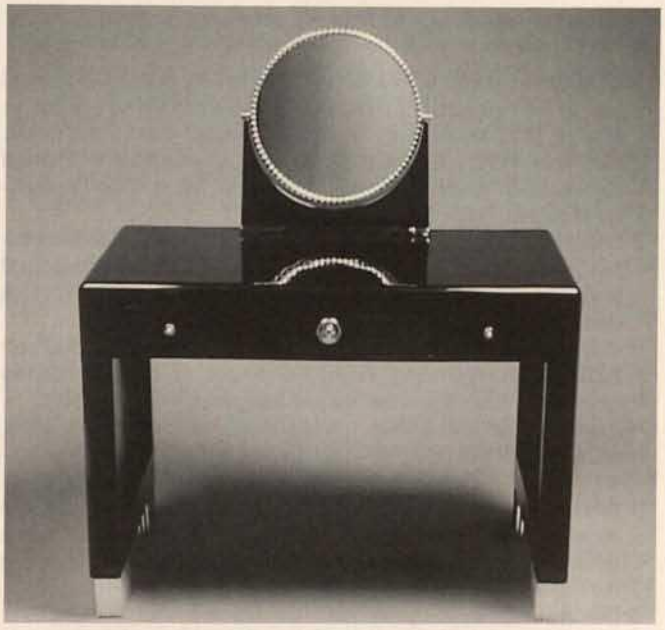
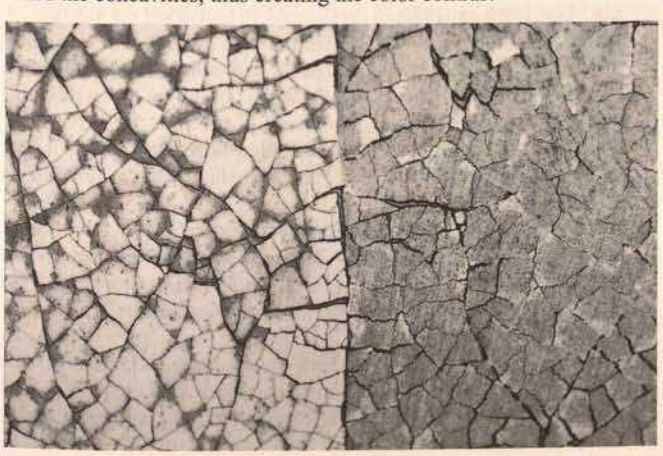


Fig. 13. 'Chinoise' vanity by Émile-Jacques Ruhlmann and Jean Dunand, ca. 1929. The Metropolitan Museum of Art, New York, Gift of Mr. and Mrs. Michael Chow, 1986 (1986.399.3a, b)

Dunand's most extensive commissions were the monumental decorative wall panelings for the luxurious ocean liners: the 'Ile de France' (1927), 'l'Atlantique' (1931), and the 'Normandie' (1935). Their luxurious interiors presented the best contemporary French design. For the 'Normandie' project Dunand was required to use fire resistant materials, which confronted him with yet another new challenge. He developed a gypsum-based material, which contained urushi and which could be cast, carved, and lacquered. The photograph shows Dunand demonstrating with a blow torch the fire resistance of a lacquered table, cast of his newly invented material (fig. 14).

The enormous demand for Dunand's lacquerware and the production of large-scale projects required the constant expansion of his workshop on the Rue Hallé. A ground plan from 1935 outlines his premises, which included a show room, an office, several lacquer studios including one for gilding, as well as designated areas for designing, model making, metal working, cabinet making, casting, and sculpture. For the curing of lacquered surfaces there were several humidity chambers, where water was running down the walls to maintain a high humidity level, and a large kiln for heat resistant substrates.[39] The number of craftsmen and assistants working in Dunand's studio varied depending on the scale of his commissions. In the twenties and thirties, Dunand had about 40-60 employees, nearly half of them Indochinese lacquer workers.[40] During the production of the decorative wall panels for the 'Normandie' Dunand employed more than 100 people to complete this enormous project.

Fig. 12. Detail of table top decorated with crushed eggshells, arranged in a chequered pattern. The eggshells that appear predominantly white were positioned convex side up, while the adjacent eggshells were placed concave side up and the subsequently applied grayish lacquer filled the concavities, thus creating the color contrast



Considering that Dunand's lacquer oeuvre is based on a two months course in the Japanese lacquer technique, his ingenuity in this field is remarkable. Dunand was an extremely open-minded artist and above all an outstanding, multi-talented craftsman, who was constantly looking for new inspirations, and was driven by his own high technical and aesthetic standards. Oriental lacquer presented to him a challenging medium that was difficult to master and provided endless opportunities to develop new techniques and applications. Dunand combined a modern sensibility with a traditional but foreign material, thereby making Oriental lacquer highly fashionable in the Art Déco period. His reputation and mastery of urushi was such that lacquer experts from Tokyo regularly paid visits to his studio to study his innovative techniques and to acquire representative examples of his lacquerwork.[41] His success was also based on the close collaboration with his oldest son Bernard, himself a lacquer artist, and the help of his many Asian assistants, who produced most of the lacquerware under Dunand's supervision.[42]

Dunand died at the age of 65 on June 7, 1942. Although faced with the shortage of materials during World War II, he continued to work and to find new ways to express his creativity. A photograph, taken shortly before his death, shows Jean Dunand planing wood; the resulting shavings were lacquered and applied to hats created by the milliner Mme Agnès (fig. 1).

Notes

1 Dunand was named Jules John, but after settling in Paris he adopted Jean as his first name in 1909. Dunand became a French citizen on May 29, 1922. MARCILHAC, FÉLIX: *Jean Dunand – his life and works*, New York, 1991, p. 26 and p. 37. This major monograph on Dunand was originally written in French: MARCILHAC, FÉLIX: *Jean Dunand – vie et oeuvre*, Paris, 1991.

2 Dinanderie is a term derived from the name of the Belgium town Dinant, which specialized in hand-crafted domestic and ecclesiastical metal objects made of brass, copper and bronze during the 12–15th centuries.

3 GAUTHIER, MAXIMILIEN: 'Vingt minutes avec M. Jean Dunand', in: *La Renaissance politique, littéraire, artistique*, ca. 1923. I would like to thank M. Félix Marcilhac for providing a copy of this article.

4 ADAM, PETER: *Eileen Gray – architect/designer*, New York, 1978, pp. 49–50. MARCILHAC 1991, pp. 28–29, and p. 170. LORAC-GERBAUD, ANDRÉE: *L'art du laque*, Paris, 1973, p. 100. LORAC-GERBAUD, ANDRÉE: *Les secrets du laque*, Paris, 1996, p. 160. Lorac-Gerbaud mentions in his 1996 publication that Sugawara came to Paris with a friend, the ébéniste Inagari, rather than with a Japanese delegation to the Exposition Universelle.

5 Dunand's notebook is preserved in the Dunand family archive.

6 The different phonetic transliterations from Japanese into French, German, and English have to be considered for the interpretation. To complicate this matter Dunand also used various spellings for the same Japanese term.

7 The location of most sample boards (each 20 x 13 cm) and the report is still unknown. Investigations conducted by Hans-Werner Pape, Chief Conservator, Kunstgewerbemuseum Berlin, revealed that the museum's inventory lists the transfer of 100 Japanese lacquer sample boards from Rein's collection, on April 9, 1934 to the Völkerkunde Museum in Berlin. According to Birgit Kantzenbach, Conservator at the Ethnologisches Museum, seven of Rein's sample boards from a later set are preserved in the Museum's collection. During World War II most samples might have been either destroyed or lost. I am grateful to Hans-Werner Pape and Birgit Kantzenbach for this information.
According to Rein, his report formed the basis of his later publication on Japanese lacquer work. REIN, JOHANNES JUSTUS: *Japan nach Reisen und Studien im Auftrage der königlich preussischen Regierung dargestellt. Land- und Forstwirtschaft, Industrie und Handel*, 2nd Volume, Leipzig, 1886, pp. 400–448. Published in English as: REIN, JOHANNES JUSTUS: *The industries of Japan. Together with an account of its agriculture, forestry, arts, and commerce, from travels and researches undertaken at the cost of the Prussian government*, New York/London, 1889, pp. 338–377.

8 Most of the 170 items from the Quin collection are preserved in the Economic Botany Collections, Royal Botanic Gardens Kew. QUIN, JOHN J.: *Report by her Majesty's acting consul at Hakodate on the lacquer industry of Japan*, London, 1882. QUIN, JOHN J.: *Urushi – The technology of Japanese lacquer*, reprint of the 1896 edition, Portland/Oregon 1995. JAESCHKE, HELENA: 'Reflections on lacquer', in: *Kew*, spring 1991, pp. 22–25. I am grateful to Naomi Rumball, Assistant Curator, Economic Botany Collections, Royal Botanic Gardens Kew, for providing a copy of Jaeschke's article.

9 Rein and Quin both identified the Japanese lacquer tree as *Rhus vernicifera*. The currently used and correct botanical name of the species is *Toxicodendron vernicifluum* (Stokes) F. Barkley; *Rhus vernicifera* D.C. and *Rhus verniciflua* Stokes are synonyms. VOGL, OTTO/QIN, MEIFANG AND MITCHELL, JOHN D.: 'Oriental Lacquers. 7. Botany and chemistry of Japanese lacquer and the beauty of the final art objects', in: *Cellulose Chemistry and Technology*, 1995, 29, pp. 273–286. I would like to thank Dr. Dennis Stevenson, Director of the Plant Research Laboratory, The New York Botanical Garden, for his help in clarifying these terms.

10 REIN 1889, p. 350. Dunand also refers to 'Sessimé' as a transparent lacquer and mentions that transparent lacquer is obtained from the tree-trunk.

11 The term 'Schuaye' is spelled in various ways in Dunand's notebook: 'Shuai', 'Schay', 'Shuay', 'Schuay' and 'Schuai'. The oil component of 'Schuaye' is most likely Perilla-oil, which Rein and Quin mention in connection with oil-containing lacquer. REIN 1889, p. 352. QUIN 1882, p. 8.

12 Dunand notes that 'Kekso' is used to fill joints and contains equal amounts of 'Sessimé' and rice starch mixed with hemp or cotton fibers. It is made of the same amount of 'Sessimé' and rice starch and employed for pasting cloth. 'Kiriko' is a mixture of 1/3 'Dzinoko' (powdered burnt clay), 2/3 'Tonoko' (finely ground clay) and water to which an amount of 1/4 'Sessimé' is added. Coarse 'Dzinoko' contains 'Sessimé', a little rice starch diluted with a lot of water and coarse 'Dzinoko' (powdered burnt clay) while fine 'Dzinoko' has the same composition, except using most likely a finer powdered burnt clay, which is not specifically mentioned. Dunand describes that 'Sabi' contains 'Tonoko' (finely ground clay) 'Sessimé', and a little water.

13 In his notebook Dunand mentions two stones by name: 'Arato', which according to Quin is a rough wet stone, and 'Nagato', which could refer to 'Nagura-to-ishi', the finest wet polishing stone. Quin 1882, p. 10. Three different charcoals are used and Dunand specifies that the end-grain direction of the charcoal pieces must be perpendicular to the polishing movement: 1. 'Honokizzimi', 2. 'Schirougazzimi' and 3. 'Loelozzimi'. Afterwards the lacquer is polished with powdered 'Loelozzimi', 'Tonoko' (finely ground clay) and 'Tsinoko' (powdered calcined deer antler) applied with oil and a cloth, cotton wool, or filter paper ('Yossimo Gami', also used for filtering lacquer). The best results are achieved by final polishing with the palm or finger, and women's fingers seem to be extremely suitable as Dunand noted: 'le doigt de femme est très bon pour bien finir.'

14 'Les laqueurs qui ne savent pas bien polir et dresser une laque avec leur charbon, sont dénommés "Chameaux", parce [sic] le chameau a 2 bosses, il est comme la laque mal dressée.' Another note from his booklet addresses the same concern: 'Les laques qui ne sont pas très bien polies sont appelées laques de paresseux.'

15 'Louiro – 1re qualité laque noire. Cette laque est faite avec la laque Sessimé – prendre de la limaille de fer – y mettre un peu de vinaigre – ensuite le mélanger dans la laque et passer sur le feu (avec le filtre).' Quin and Rein both mention, that in the preparation of black 'Ro-iro-urushi/Ro-urushi Haguro', a dye used by women to blacken their teeth, which is a solution formed by boiling iron filings in rice vinegar, is added to the lacquer. QUIN 1882, p. 7 and REIN 1889, pp. 352–353. Dunand mentions the use of 'Yossimo Gami' paper for filtering lacquer.

16 With regard to 'Schuaye', Dunand describes in one occasion the use of 'Honokizzimi' charcoal to smooth each of three layers of transparent 'Schuai' after drying for 2 hours; however, no final polishing is mentioned.

17 The temperature of the oven was noted as 100 °C for the first five hours, followed by 30 minutes at 150 °C and 10 minutes at 180 °C.

18 The lessons started on May 16 and continued until the end of June in 1912.

19 'Pour obtenir un laque réussi, vingt-deux opérations sont nécessaires. Et les matières prémières ne sont pas seulement d'un maniement difficile; leur nocivité ne me permet d'employer, à ce genre de travaux, qu'une main-d'oeuvre elle-même importée, si l'on peut dire; mes ouvriers chinois, japonais, annamites, manipulent impunément des produits qui font, sur l'ouvrier européen, effet de poison.' GAUTHIER ca. 1923.

20 At the 1921 Salon des Artistes Décorateurs in Paris Dunand exhibited for the first time a lacquer panel depicting fishing boats seen against a mountain landscape, which was based on a sketch by his friend, the painter Henry de Waroquier. MARCILHAC 1991, p. 35.

21 GIMBEL, RENÉ: *Diary of an art dealer*, New York, 1966, pp. 137–138. The diary was first published in French: GIMBEL, RENÉ: *Journal d'un collectionneur*, Paris, 1963, pp. 165–166.

22 The exhibition, entitled 'Jean Dunand: Master of Art Deco', took place from May 23 – October 25, 1998 and was organized by J. Stewart Johnson, Consultant for Design and Architecture and Jared Goss, Curatorial Assistant, Department of Modern Art, The Metropolitan Museum of Art.

23 A 1929 article in Vogue magazine, devoted to Crocker's luxurious apartment, praised its modern interior, which also included rooms designed by Jean-Michel Frank, Pierre Legrain and Mme Lipska. MILLER 1929.

24 In the above mentioned Vogue article the bedroom was described as follows: 'In the adjoining bedroom, Dunand has again contrasted his own love for movement and design with Frank's monotones. Here again, laque arrachée on the walls is worked into a modern design in tones of silver and grey with overtones of tan, giving the effect of a woodland. Over the head of the bed, a life-sized deer nibbles a miraculous green bough, and on an adjacent wall, his companion sips calmly from a spring. These deer are made of thin sheets of lead, inlaid with colours. The furniture, low and square, is of black and grey lacquer, with a note of white in the ivory knobs of the commode and the goatskin that covers the chairs. The curtains are of grey chamois in three shades.' MILLER 1929, p. 94. Photographs of the bedroom suite in the Dunand family archive show the following comment written on the back: 'Boiseries en laque arrachée argent, gazelle en plomb incrusté, meuble en laque chine gris et noir.'

25 Elemental analyses of cross sections of lacquer samples were carried out by Mark T. Wypyski, Associate Research Chemist, The Sherman Fairchild Center for Objects Conservation, The Metropolitan Museum of Art, using an energy-dispersive X-ray spectrometer (EDS) attached to a scanning electron microscope. EDS analysis of the black lacquer detected the presence of iron in the layer, indicating the use of 'Louero' lacquer. Fluorescence microscopy of cross sections from samples of the bedroom furniture showed a maximum of 8 ground layers, including cloth, applied to wood and plywood substrates. EDS analyses of the ground layers revealed large amounts of silicon, with lower quantities of magnesium, aluminum, sulfur, potassium, calcium, and iron, apparently a mixture of silica particles and clay. The bottom ground layers also contain bast fibers and wooden particles, the latter most likely in the form of saw dust. I would like to thank Mark T. Wypyski for performing all EDS analyses.

26 The metal filings and pigments were identified by EDS and X-ray diffraction analysis. Some silicon, phosphorus, sulfur, calcium and barium were also detected in the silver-gray lacquer, suggesting the presence of silica, barium sulfate and calcium phosphate particles, the latter possibly in the form of bone or ivory white.

27 The lacquer was analyzed by Prof. Dr. Tetsuo Miyakoshi, Department of Industrial Chemistry, Meiji University, using pyrolysis-gas chromatography/mass spectrometry. I am very grateful to Prof. Dr. Miyakoshi for conducting the analysis of four samples from the Dunand bedroom furniture. MIYAKOSHI, TETSUO: 'The analysis of urushi by pyrolysis-gas chromatography/mass spectrometry', in this publication. *Rhus succedanea* also grows in Taiwan, but because Indochina was a French colony at that time, it is more likely that Dunand imported his lacquer from there.

28 The panels are now in the collection of the Musée des Arts d'Afrique et d'Océanie in Paris, which is housed in the Palais Permanent des Colonies, where Dunand's panels were originally displayed. MARCILHAC 1991, pp. 119–120.

29 'Sur une laque d'or en feuilles sèche passer une couche de laque à la terre arrachée et tracer des décors dedans pendant qu'elle est fraiche. Après séchage passer légèrement en papier de verre fin.'

30 In addition to the two screens, which are now in the collection of the Metropolitan Museum, two double doors decorated with angels sounding horns and a small panel depicting St. Michael and the Dragon were also made by Soudbinine and Dunand for the music salon. Photographs of the original interior of the music room and both screens are published by Marcilhac. MARCILHAC 1991, p. 323, color plate 163.

31 The gilding was probably executed by a craftsman named Zuber, who was the specialist for gold lacquer in Dunand's workshop. EDS analysis of the red lacquer, identified vermilion as the red pigment, based on the presence of mercury and sulfur.

32 EDS analysis characterized the composition of the gold leaves as about 90 % gold, 7% silver and 3% copper by weight. Cross sections of the darker gilding viewed under a fluorescence microscope showed an orange fluorescence of the applied coating, which most likely indicates the use of shellac. It is known that Dunand used shellac, and in this case he might have chosen it because of its orange coloration.

33 The examination of cross sections from the blue green lacquer of the background showed a mixture of coarse blue, fine blue-green and yellow pigments. EDS analysis of the blue-green lacquer detected mainly chromium, aluminum, and cobalt, with traces of silicon, sulfur, calcium, and iron, most likely due to the use of cobalt blue, chromium oxide green and an organic yellow pigment.

34 For the fluorescence microscopy the following filter set was used: excitation filter 365 nm, chromatic beam splitter 395 nm and emission filter 397 nm.

35 Records of a sample board made in 1932 in Dunand's workshop describe the technique as follows: 'Sur une couche de laque noire coller des morceaux de laque à la terre rouge. – Morceaux obtenus en cassant une plaque de laque à la terre faite en passant une couche de cette laque sur du papier et en la faissant cuire au four. La laque à la terre rouge était obtenue avec de l'ocre rouge, de l'eau et moitié laque transparente, moité laque naturelle. Après séchage passer une couche de laque noire. Après séchage poncer et polir.'

36 CAMARD, FLORENCE: *Ruhlmann*, Paris, 1983. The dressing table with the black lacquer and abstract eggshell decoration as well as the matching chair are illustrated on p. 60 and 275.

37 In addition to signing his work, Dunand also stamped pieces produced in his workshop. The heated metal stamp left the following imprint on unexposed lacquered and wooden surfaces of the Crocker bedroom furniture: 'JEAN DUNAND – 72 RUE HALLE – PARIS – MADE IN FRANCE'.

38 In the 1927 October issue of the magazine Arts & Decoration a page was devoted to Jean Dunand's spectacular portraiture, showing four different portraits of famous French women. In Paris you must have a lacquer portrait, in: *Arts & Decoration,* October 1927, p. 134.

39 A-DAYOT, MAGDELEINE: 'Art et technique – une visite à Jean Dunand', in: *L'Art et les Artistes*, November 1936, pp. 57–62. MARCILHAC 1991, p. 172.

40 DUNAND, BERNARD: 'Jean Dunand', in: *Club français de la Médaille*, 1982, No. 77, p. 42–43 and 49.

41 GARNER, PHILIPPE: 'The lacquer work of Eileen Gray and Jean Dunand', in: *The Connoisseur*, May 1973, pp. 3–11. Dunand also participated in an exhibition of French decorative arts shown in Japan. MARCILHAC 1991, p. 72.

42 From 1925 on Bernard Dunand was Jean Dunand's closest collaborator. Thanks to his understanding and appreciation, as well as his own involvement as a lacquer artist, many utensils, materials, documents and sample boards from Jean Dunand's workshop are preserved. I had the honor to meet Bernard Dunand three weeks before he died at the age of ninety. The talk associated with this article was dedicated to Bernard Dunand. I am also most grateful to M. and Mme Christian Dougoud for their strong encouragement of my ongoing research about the lacquer techniques of Jean Dunand.

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Fig. 9: Réunion des Musées Nationaux, Agence photographique, Paris

Figs. 1, 14: Dunand family archive

Colour plate XXIII.1–4: Author; 5: The Metropolitan Museum of Art, New York

Fig. 14. Jean Dunand demonstrating with a blow torch the fire resistance of a lacquered table, cast with a newly developed material, 1935