AN EXAMINATION OF THE NAPOLEON DIAMOND NECKLACE

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Napoléon Bonaparte gave an extraordinary diamond necklace to his empress, Marie-Louise, in 1811. Its intriguing history involves both royals and con artists (and one individual who was both), and it was ultimately donated to the Smithsonian Institution in 1962. Infrared absorption analysis of 101 stones in the necklace revealed that a high proportion of the larger diamonds are the relatively rare type IIa; most of the smaller stones are type IaAB. The luminescence behavior of the diamonds to ultraviolet exposure correlates with their diamond types.

Napoléon Bonaparte presented the diamonds now known as the Napoleon Necklace (figure 1) to his second wife, Marie-Louise of Austria, Empress of France, as a gift to celebrate the birth of their son, Napoléon François Joseph Charles, the King of Rome (later the Duke of Reichstadt), in 1811. The history of this jewel is well documented, and the brief summary presented here is based on an account by Bratter (1971) and unpublished research conducted in the National Archives of France by Marvin C. Ross. Mr. Ross was employed by American socialite Marjorie Merriweather Post, who donated the necklace to the Smithsonian Institution in 1962 (Post, 1997), and his notes are currently stored at the Hillwood Museum in Washington, DC (with copies at the Smithsonian).

The necklace was assembled in Paris by the firm of Nitot and Sons. Jeweler Ernst Paltscho (1811), who examined it at the time, estimated its value at 376,275 French francs. This was an enormous sum of money, approximately equal to the Empress's regular household budget for an entire year. Several portraits were subsequently painted of Marie-Louise wearing the necklace (e.g., figure 2).

When Napoléon was exiled to Saint Helena in 1815, Marie-Louise returned to Austria with her personal jewels, including the diamond necklace. After her death in 1847, the necklace passed to her cousin, Archduchess Sophie, who removed two diamonds from the necklace in order to shorten it and put them into earrings (the current whereabouts of these earrings is unknown). Following the Archduchess's death in 1872, the necklace was inherited by her three surviving sons, one of whom, Charles Louis, later acquired the interests of his two brothers. Charles Louis's third wife, Maria Theresa, inherited the Napoleon Necklace upon his death in 1914.

One of the more unusual episodes in the necklace's history took place in 1929, when Archduchess Maria Theresa sent the jewel to the United States to be sold. The agents she chose represented themselves as "Colonel Townsend," who had allegedly served in the British Secret Service, and his wife "Princess Baronti," a novelist (Nicolet, 1930; Bratter, 1971). These representations were false, and in fact the couple's true identities have never been con-

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Figure 1. The Napoleon Necklace, assembled in 1811, was presented by Napoléon Bonaparte to his second wife, Marie-Louise, to celebrate the birth of their son. It is composed of 234 diamonds weighing about 263 carats (width of the necklace as shown is about 20 cm), and is currently on exhibit at the National Museum of Natural History, Smithsonian Institution, in Washington, DC. Photo by Chip Clark.

firmed. Maria Theresa was seeking $450,000 for the necklace, but after the stock market crash in October of that year, the Townsends realized that a sale for this sum was impossible. They enlisted the assistance of Archduke Leopold of Hapsburg, Maria Theresa's grandnephew, to authenticate the necklace to prospective buyers and to provide credibility to the story that it was being offered at the bargain price of $100,000 because Maria Theresa was desperately in need of money. The Townsends negotiated deals to sell the necklace, first to New York jeweler Harry Winston and then to one Harry Berenson of Boston, but both backed out. David Michel, a New York diamond dealer, finally bought it for $60,000. The Townsends sent $7,270 to Maria Theresa and kept the balance of $52,730 to cover their "expenses related to the sale," which included a reported $20,000 for Leopold.

Prior to the sale, however, Maria Theresa had revoked the Townsends' authority to sell the necklace and sent an emissary to New York to retrieve the diamonds. The affair ultimately went to the courts. In the end, the necklace was returned to Maria Theresa and Leopold went to jail, while the Townsends fled the authorities and dropped out of sight.

In 1948, the Hapsburg family sold the necklace to Paul-Louis Weiller, a Paris industrialist and patron of the arts. Harry Winston acquired the necklace in 1960 and sold it to Marjorie Merriweather Post. In 1962, she gave the necklace in its original case (figure 3) to the Smithsonian Institution. The necklace is currently on exhibit in the Natural History Museum's National Gem and Mineral Collection Gallery.

The Napoleon Necklace contains 234 colorless to near-colorless diamonds set in silver and gold (again, see figure 1); the diamonds total approximately 263 carats, with the largest stone weighing about 10.4 ct. The piece consists of 28 old mine–cut diamonds, from which are suspended a fringe of nine pendeloques (five pear shapes—some with rounded points—alternating with four ovals) and 10 briolettes. Above each pear shape is mounted a small brilliant, while the four ovals are attached to motifs decorated with 23 smaller diamonds (figure 4, left). Each of the 10 briolette mountings is set with 12 rose-cut diamonds (figure 4, right).

In his description of the necklace, Paltscho (1811) detailed each stone by cut, weight, and price. The origins of the diamonds were not noted, but in 1811 the only significant diamond sources were India and Brazil. Paltscho does not describe the

Figure 2. This painting by Giovan Battista Borghesi depicts Marie-Louise wearing the diamond necklace while she was Duchess of Parma, after Napoléon's abdication in 1815. It currently resides in the Galleria Nazionale in Parma, Italy; courtesy of Scala/ Art Resource, New York.

quality of the stones, and, as far as is known, they have never been removed from their mountings.

Materials and Methods. We studied 101 of the 234 diamonds in the necklace: the 52 larger diamonds (~2.5–10.4 ct) and a selection of the others. We used a Meiji binocular microscope with attached polarizers to examine surface and near-surface features. We could not conduct a detailed study of the diamonds' interiors because the stones could not be removed from the historic and fragile mounting. We measured infrared spectra using a Bio-Rad Excalibur Series Fourier-transform infrared spectrometer (4 cm^{-1} resolution) fitted with a UMA-500 microscope. The microscope made it possible to direct the IR beam through the table and large culet of the old mine–cut diamonds. We observed the ultraviolet (UV) luminescence of all 234 diamonds using a Super Bright long- and short-wave UV lamp (365 and 254 nm respectively). UV luminescence descriptions for the 52 larger diamonds are given in a table available in the *G&G* Data Depository (www.gia.edu/gemsandgemology).

Results and Discussion. After almost two centuries, the necklace is in generally good condition. Several solder joints have been repaired, and a few of the larger diamonds show minor chips. There are obvious crystalline inclusions in some of the diamonds; for the most part, these appear to be sulfide crystals with associated disc-shaped tension halos (Richardson et al., 2004).

Luminescence reactions of the 52 larger diamonds to UV radiation (figure 5) fell into three groups. The six diamonds in the first group were inert to both long- and short-wave UV. The seven diamonds in the second group displayed pinkish orange fluorescence that was more intense to short-wave than long-wave. The strength of the short-wave UV luminescence ranged from weak to strong, depending on the diamond. No phosphorescence was observed from the diamonds in the second group. The third and largest group (39 diamonds)

Figure 3. Shown here is the original case for the Napoleon Necklace (21.8 cm in diameter), made in Paris by Gruel (see inset). It is also part of the Smithsonian National Gem Collection. Photos by Kenneth Larsen.

Figure 4. At left is a detail of one of the necklace's four oval pendeloques (1.5 cm; diamond no. 40 in the G&G Data Depository table), which is set with 23 smaller diamonds. The mountings for the briolettes (right, width 1 cm; diamond no. 37) are set with 12 rose cuts (some are very small and not visible in this photo). Photos by Chip Clark.

exhibited blue fluorescence that was stronger for long-wave (medium to very strong) than for short-wave (very weak to strong) UV. Diamonds in this group that showed strong fluorescence also exhibited strong whitish phosphorescence (again, see the table in the *G&G* Data Depository for complete descriptions).

The diamond types of the 52 larger diamonds, as determined from the IR spectra, are indicated in figure 5. Thirteen diamonds are type IIa (i.e., without nitrogen bands visible in their IR spectra; Fritsch and Scarratt, 1992); the remainder are type Ia diamonds with both A and B nitrogen aggregates (IaAB). These type Ia diamonds are similar to one another in that all contain small-to-moderate amounts of hydrogen, showed the Raman absorption line, and had (in most cases) high levels of platelets (e.g., figure 6, left). The absorption band at 1430 cm^{-1}, which is nitrogen

Figure 5. When the Napoleon Necklace is exposed to UV radiation (here, combined long- and short-wave UV), a variety of responses—pinkish orange, blue, or inert—can be observed. The diamond types, as determined by infrared spectroscopy, are labeled for the 52 larger stones; label colors correspond to the type of fluorescence: pink for pinkish orange, white for blue, and gray for inert. Photo by Chip Clark.

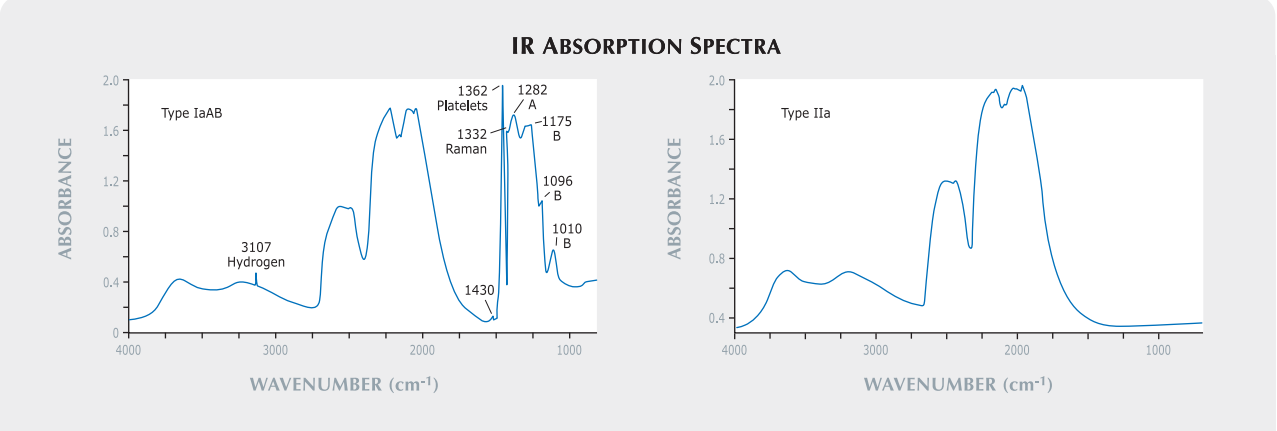

Figure 6. Typical infrared spectra of diamonds from the Napoleon Necklace are shown here for a type IaAB diamond (left, diamond no. 2), which shows the Raman line and absorption bands arising from the presence of A and B aggregates, platelets, and hydrogen; and for a type IIa diamond, which shows only the intrinsic absorption of diamond (right, diamond no. 37).

related (and correlates to N3 in type Ia diamonds; Zaitsev, 2001) was observed in the spectra of 19 of the 39 larger IaAB diamonds and in eight of the 49 smaller ones.

Comparison of luminescence behavior with diamond type reveals that type IIa diamonds were in the first and second fluorescence groups and showed either no fluorescence or pinkish orange fluorescence. The type Ia diamonds were in the third group of 39 stones that showed blue fluorescence. Interestingly, *all* of the larger type Ia diamonds in the necklace fluoresced (though very weakly in some cases), which is a significant departure from the overall average of 35% for colorless diamonds as reported by Moses et al. (1997).

It is also noteworthy that 13 of the 52 larger diamonds in the necklace are type IIa (again, see figure 5, and, e.g., figure 6, right); this includes seven of the nine large pendeloques, five of the old-mine cuts, and one of the briolettes. It appears that 200 years ago, as today, the finest large colorless diamonds were often type IIa (e.g., King and Shigley, 2003). Pinkish orange–fluorescing type IIa diamonds are commonly called *Golconda diamonds* (Scarratt, 1987; Fritsch, 1998), in reference to the historic trading area in India, a possible source for these stones. Golconda diamonds typically are described as having a faint-to-light pink color. However, no pink hue was evident in the type IIa diamonds in the Napoleon Necklace (as observed in the setting). This is consistent with observations on the larger (20.34 ct) diamond in the Marie Antoinette earrings (also in the Smithsonian National Gem Collection), which Fryer and Koivula (1986) described as colorless to near colorless (again, as observed in the setting) and is another type IIa diamond exhibiting pinkish orange fluorescence. (Note that Fryer and Koivula also reported blue fluorescence for this stone; however, our examination—conducted with the diamond unmounted—showed a pinkish orange reaction to short-wave UV.) The 34 ct Little Sancy, yet another historic colorless diamond, exhibits the same properties (E. Fritsch, pers. comm., 2007).

When examined between crossed polarizers, all the type IIa diamonds showed banded and cross-hatched extinction patterns with first-order interference colors of gray to blue. This feature, called "tatami graining," is typical of type IIa diamond (Smith et al., 2000).

Conclusion. Not only is the Napoleon Necklace a historic icon, but it also contains gemologically notable diamonds. Infrared spectroscopy indicated that 13 of the 52 larger diamonds are the relatively rare type IIa and are colorless to near colorless with good clarity, consistent with the jewel's imperial pedigree. Apparently, the standards used 200 years ago to select the finest diamonds are similar to those still used today. The necklace is equally spectacular under an ultraviolet lamp, and the diamonds' luminescence behavior correlates to their diamond type. Furthermore, it seems that colorless

or near-colorless type IIa diamonds showing a pinkish orange fluorescence are more common than previously thought. Indeed, those characteristics were usually associated with pink Golconda diamonds, but the diamonds examined here show no obvious bodycolor.

The Napoleon Necklace is one of the most spectacular jewelry pieces of its period. With this report, it joins other items in the Smithsonian's National Gem Collection for which gemological data have been preserved in the literature.

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