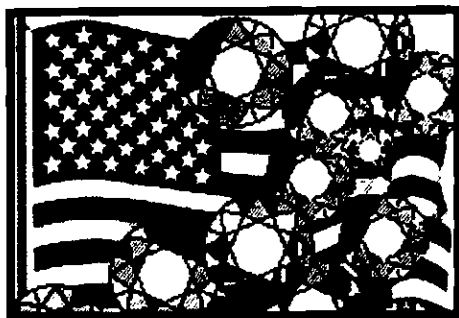


# ARTICLES



## The United States of America: A Cornerstone of the World Gem Diamond Industry In the 20th Century

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### SUMMARY

Throughout the 20th century, the United States has been the primary consumer of gem-quality diamonds. From the early 1900s to 1975, it consumed at least 50% of the world's diamond supply by both weight and value; from the late 1970s to 1999, its proportion of world consumption varied from about 40-67% by weight and about 28-48% by retail jewellery value. Japan is the only other country to qualify as a major consumer of gem diamonds in the 20th century and this has occurred only since 1972. As we enter the 21st century, gem diamond consumption continues its historic pattern of extreme reliance on the buying habits of one nation, *i.e.*, the United States.

### RÉSUMÉ

Durant tout le 20<sup>e</sup> siècle, les États-Unis d'Amérique ont été le premier consommateur de diamant de joaillerie. De 1900 à 1975, ce pays a utilisé au moins 50 % de la production mondiale, tant en poids qu'en valeur; de 1970 à 1999, sa part de la consommation mondiale de bijou a fluctué de 40 à 67 % en poids, et de 28 à 48 % en valeur au détail. Le Japon est le seul autre pays qui peut être qualifié de consommateur important de diamant de joaillerie au 20<sup>e</sup> siècle, mais seulement depuis 1972. Depuis le début du 21<sup>e</sup> siècle, la consommation de diamant de joaillerie continue d'afficher un profil historique d'extrême dépendance des habitudes de consommation d'un unique pays, *i.e.*, les États-Unis d'Amérique.

### INTRODUCTION

During its first full year of production in 1999, the Ekati Diamond Mine, in Canada's Northwest Territories, produced 2.51 million carats of rough diamonds. This instantly made Canada one of the world's important diamond producers with about 2% by weight and 4% by value of the world's rough diamond production. Within a few years at least one additional mine, Diavik, is likely to be in full production with the possibility that soon thereafter Canadian rough diamond production will reach 10 million carats annually, comparable to that of South Africa. Canadian diamonds are mined primarily for use in the gem and jewellery trade, as are the diamonds produced in most other countries.

The rapid rise of the Canadian diamond industry and the increasing likelihood that technological advances will lead to new worldwide discoveries (Levinson and Cook, 2000) raise the question of how the world market will absorb such production increases. This question can

only be addressed if the consumption characteristics of the market are known.

For this paper we assembled data on the consumption of gem diamonds, by nations, during the 20th century. The objective was to identify national consumption trends that may have bearing on the destination of Canadian diamonds. It readily became apparent that during the 20th century the United States was, and continues to be, the world's leading consumer of gem diamonds. As a result we have placed particular emphasis on gem diamond consumption in the United States, ranging from its historical development to the current consumption rate. Natural industrial diamonds are not considered in this paper.

### DATA COLLECTION AND CALCULATIONS

Statistical data on all aspects of the notoriously secretive diamond industry are extremely difficult to obtain and what production and consumption data are available are essentially informed estimates. With these caveats in mind, we compiled Table 1 from data in the literature that report the percentage of the world's gem diamonds that were consumed in the United States during specific years in the 20th century. The data for the first half of the century, which are relatively scant, are primarily from United States government publications, whereas those for the second half of the century are primarily from trade journals. Regardless of their source, most of the data emanate from De Beers in one way or another (*e.g.*, from statements in annual reports, marketing surveys) augmented, particularly in the early part of the century, from diamond import data collected by United States Customs. These data are sufficiently numerous and reliable for the purposes of this report.

For the first 75 years of the 20th century there was no distinction between gem diamond consumption on the basis of weight and value. However, this changed with the advent of the modern diamond-cutting industry in India in the mid-1960s when small, lower-quality diamonds began to appear on the market, in ever-increasing amounts, cut from material previously classified as industrial (Sevdermish *et al.*, 1998). By 1975 India was exporting 1 million (polished) carats of these low-valued diamonds, commonly called "near gems" in the rough form and "Indian goods" in the polished form, and the amount has increased steadily and enormously in recent years (currently to ~20 million carats annually; Sevdermish *et al.*, 1998). The United States has always been the single largest market for Indian polished diamonds ("1996: Diamond content equals...", 1997; Valla, 1998). Accordingly, to better interpret the trends in diamond consumption, from 1980 onward we separated United States' gem diamond consumption into two categories, "By Weight" and "By Value."

Data are not generally available for both the "By Weight" and "By Value" categories for each year; however, a simple relationship exists between them so that one can be calculated from the other. For example, data available for 1992 (Table 1) show that the United States consumed 28% of the world's diamond jewellery by retail value ("By Value") and 40% of the world's gem diamonds by weight ("By Weight"). This enables us to calculate a conversion factor of 1.43 ( $40 \div 28$ ) from "By Value" to "By Weight." Conversion factors of 1.40 and 1.37 can be calculated for 1988 and 1989, respectively, from other data in Table 1. An essentially identical conversion factor can be calculated from data published elsewhere but not used in Table 1 (*e.g.*, 1.39 in Hasenfeld, 1999). "By Value" data are much more abundant in the literature than "By Weight" data and, therefore, eight "By Weight" values were calculated for use in Table 1, using a conversion factor of 1.40 (average of the above four factors).

It would be much more desirable to have the actual retail value of the diamonds themselves, *i.e.*, the retail value of the diamonds rather than the retail value of the diamond jewellery. This is because the latter includes certain vari-

ables that are difficult to quantify, *e.g.*, the changing value of gold, the cost of jewellery workmanship, and the variable

markups for different types and qualities of diamond jewellery. However, sufficient data for the former, *i.e.*, the retail value of

**Table 1** Percentage of world gem diamonds sold in the United States during the 20th century.

Year	By Weight and Value	Reference
1906	>50	United States Geological Survey (1907)
1907	>50	United States Geological Survey (1908)
1914	70-75 <sup>1</sup>	Wagner (1914)
1919	75	United States Geological Survey (1922)
1928	>75	Shor (1993)
1929	80	Shor (1993)
1930	75-80	United States Bureau of Mines (1933)
1932	65-70	United States Bureau of Mines (1933)
1935	80	"Diamonds II: Cutters" (1935)
1939	67	"Diamond trading over 50 years" (1984)
1946 <sup>2</sup>	75	Shor (1993)
1955	75	United States Bureau of Mines (1956)
1956	75	Moyar (1958)
1957	90	Winston (1957)
1961 <sup>3</sup>	70	"Diamond stocks are down..." (1998)
1970	>60	"The Algemene Diamantbewerkerbond..." (1970)
1972	55	Special Contributor (1973)
1975	52	De Beers (1977)

Year	By Weight	By Value †	Reference
1980	42 <sup>4</sup>	30 <sup>5</sup>	"Japan holds the key" (1997)
1982	49 <sup>4</sup>	35 <sup>5</sup>	"Japan holds the key" (1997)
1984	57 <sup>4</sup>	41 <sup>5</sup>	"Japan holds the key" (1997)
1986	53 <sup>4</sup>	38	Boyajian (1988)
1987	49 <sup>4</sup>	35	Boyajian (1988)
1988	42 <sup>5</sup>	30 <sup>5</sup>	"World diamond jewellery consumption..." (1991)
1989	41 <sup>5</sup>	30 <sup>5</sup>	"World diamond jewellery consumption..." (1991)
1992	40	28	"U.S., Japan fuel..." (1994)
1996	50 <sup>5</sup>	35 <sup>5</sup>	"1996: Diamond content equals..." (1997)
1997	56 <sup>4</sup>	40	"Rising U.S. sales..." (1999)
1998	62 <sup>4</sup>	44	"Rising U.S. sales..." (1999)
1999	67 <sup>4</sup>	48	"Diamond producers: An investor's..." (2000)

† of world retail sales of diamond jewellery

- <sup>1</sup> 70-75% applies to "diamonds produced in South Africa" (Wagner, 1914, p. 341); however, South Africa was the source of essentially the entire world production.
- <sup>2</sup> We use "1946" only, although Shor (1993, p. 132) states that the United States accounted for 75% of world diamond consumption "...during the two decades after World War II...".
- <sup>3</sup> We use "1961" only, although "Diamond stocks are down..." (1998, p. 32) states that the 70% figure applies to "... the early 1960s...".
- <sup>4</sup> This value was obtained by multiplying the "By Value" percentage (next column) by 1.4; see text for explanation.
- <sup>5</sup> This percentage was calculated from data within the reference.

the diamonds, are not readily available. The data in Table 1 are plotted in Figure 1. Where the original datum is reported as "greater than," for example ">50," it is plotted as the integer (*i.e.*, "50"). Where a range is given in the original reference, *e.g.*, "70-75," the lower value (*i.e.*, "70") is plotted.

For the objectives of this paper it became necessary to compare the relative proportions of the world retail diamond jewellery sales in the United States and

Japan in the latter part of the 20th century (discussed further below). The comparative data are plotted in Figure 2; the sources of the data are presented in the footnote to that figure. As with the United States, a conversion factor can be calculated from "By Value" data to "By Weight" values for Japan. For example, in 1992, retail diamond jewellery sales ("By Value") in Japan accounted for 29% of world consumption whereas the comparable "By Weight" figure was 19% ("U.S.,

Japan fuel...", 1994). This yields a "By Value" to "By Weight" conversion factor of 0.66 ( $19 \div 29$ ) for Japan. The difference in the conversion factors for the United States and Japan, *i.e.*, 1.40 *versus* 0.66, is explained primarily by the fact that for most of the last quarter of the 20th century, consumers in Japan bought higher-quality cut diamonds than did consumers in the United States. However, since about 1996 the quality of diamonds purchased in Japan has fallen and is now comparable to that of the United States (Mirchell, 1999), so that the 1.40 conversion factor is currently applicable in both countries.

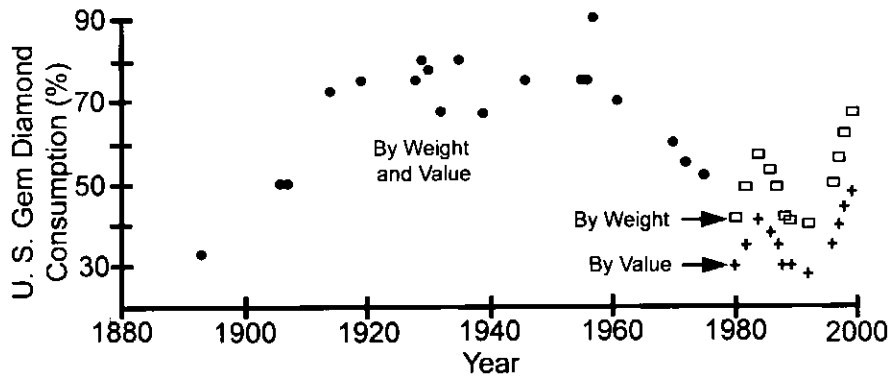


Figure 1 Plot of the percentage of the world's gem diamond production, by weight and by value, consumed by the United States in the 20th century based on the data in Table 1. See text for the explanation of why "By Weight" and "By Value" data are shown separately from about 1980 to 1999. The datum point for 1893 (value of 33%) is from Chilvers (1939).

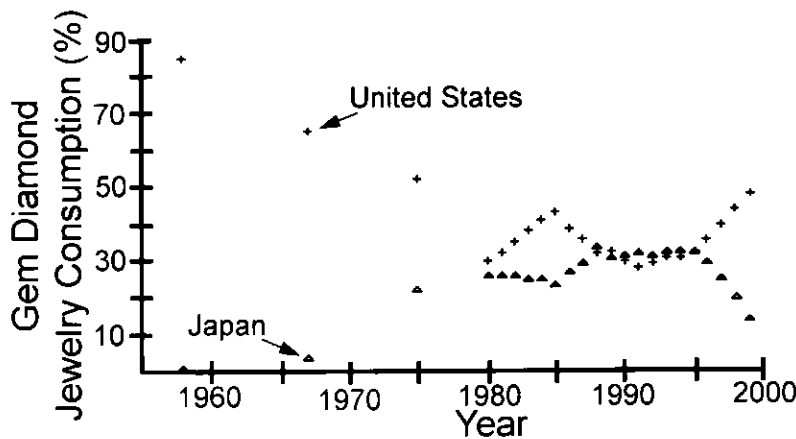


Figure 2 The proportion (in %) of world retail diamond jewellery sales in the United States and Japan (based on the retail price paid by consumers in US dollars) from 1958 to 1999.

Sources of data for Figure 2:

- 1958 (0%) and 1967(4%) for Japan: Until 1959 the importation of diamonds had not been permitted by the post-war Japanese government (Epstein, 1982) hence 1958 = 0%. The 1967 value is from Duval *et al.* (1996). 1958 (85%) and 1967 (65%) for the United States are estimated from data from approximate years in Table 1.
- 1975: De Beers (1977)
- 1980-1995: "Japan holds the key" (1997)
- 1996-1999: same as in Table 1 except for Japan in 1997 (25%) where Pruwer (1997) is used.

## DISCUSSION

The data in Table 1 and Figure 1 show that from the early 1900s (certainly from 1906 onward) to 1975 the United States consumed at least 50% of the world's supply of gem diamonds by both weight and value. From the late 1970s to 1999 its consumption of world production varied from about 40-67% by weight and about 28-48% by retail jewellery value. Thus, the United States has been the main consumer of gem-quality diamonds throughout the century.

During the last quarter of the 20th century the predominance of the United States as the main consumer of diamonds declined, particularly in the "By Value" category. This is because post-war Japan, where it was illegal to import diamonds before 1959 (Epstein, 1982), rapidly developed a voracious appetite for high-quality diamonds (Fig. 2). Within just 13 years, *i.e.*, by 1972, Japan had become the world's second largest "By Value" consumer of diamonds (Special Contributor, 1973) accounting for ~15% of world consumption (estimated from Fig. 2). This trend continued, reached its peak, and stabilized between 1988-1995 when Japan accounted for 31-33% of world consumption "By Value," slightly exceeding that of the United States for most of this period (again see Fig. 2). Applying the 0.66 conversion factor (discussed above) to the "By Value," Japan consumed about 21% of world diamond consumption "By Weight," or about half of that consumed in the United States (Table 1).

Since 1996 diamond consumption in Japan has been declining, in both

the "By Value" and "By Weight" categories, because of economic conditions, but this has been accompanied by a rise in consumption in the United States. Since the early 1980s, the United States and Japan together have consistently consumed more than 60% of the world's diamonds in both categories; in several years this value has exceeded 70%.

### **THE RISE OF GEM DIAMOND CONSUMPTION IN THE UNITED STATES (19th and Early 20th Centuries)**

In view of the importance of the United States to the past, current, and future world diamond industry, it is instructive to review the history of the rise of gem diamond and diamond jewellery acquisition in the United States in the 19th and early 20th centuries.

The acquisition of diamond jewellery in small amounts has been documented in the United States since Colonial times; for example, Martha Washington had a diamond wedding ring (Fales, 1995). However, with the discovery of the prolific South African deposits in 1867 and the beginning of diamond mining there a few years later, large quantities of diamonds began arriving in the United States. From a slow start in 1875, the United States soon became "ablaze with diamonds" (Fales, 1995, p. 309). By the end of the 19th century, three American women, Mrs. John Jacob Astor, Mrs. Clarence Mackay, and Mrs. Leland Stanford, were each said to own more fine diamonds than any of the European royal families, with the exception of the Queen of England and the Empress of Russia. The history of diamond jewellery in the United States from 1600 to 1900, with particular emphasis on the upper class, is recorded by Fales (1995).

Americans of lower social and economic standing also participated strongly in diamond jewellery acquisition. In the 1850s and 1860s, when most of the world's diamonds came from Brazil, there was already a significant demand in the United States where "even hotel waiters and [...] minstrels wear diamonds in rings and shirt fronts" (Worger, 1987, p. 5). From the mid-1870s, corresponding with the availability of South African diamonds, smaller varieties of diamonds began to sell to an ever expanding retail

market (Newberry, 1989). This phenomenon not only continued unabated into the 20th century, but gained momentum, as Cattelle (1911, p. 27-28) observed: "Twenty-five years ago [1886], few jewelers in the United States carried diamonds in stock; to-day there is scarcely a jeweller in the States, even in remote hamlets, who does not carry some, and jewelers of prominence carry an average of from one hundred thousand to a million dollars worth."

The most convincing evidence for the explosive demand for diamond jewellery among the ordinary citizens of the United States can be found in several retail and mail order catalogues of the time. The Sears Roebuck Catalogue (1897), which only displayed articles that people really wanted and bought, contained 109 diamond offerings (three pages) in a wide variety of forms, mainly rings, scarf and stick pins, shirt studs, ear drops, pendants, brooches and lockets. The Marshall Field & Co. Catalogue (1896) displayed 148 offerings (six pages) of similar types; this was a wholesale catalogue but with retail prices shown. The items were available from stock in Chicago and could well have been the source of some of the diamond jewellery obtained by the jewellers in the remote hamlets mentioned above. In Canada, the T. Eaton Co. Catalogue (1901) illustrated about 30 diamond rings (one half page) most of which also contained other gemstones (*e.g.*, sapphire, amethyst, peridot).

The above observations with respect to the development of a "diamond culture" in the United States in the late 1800s are confirmed by the declared value for customs purposes, of gem diamonds imported into the United States (United States Geological Survey, 1904; number of carats imported is not given). In 1867 about \$1 million of cut gem diamonds were imported; this figure rose steadily to about \$12 million in 1890. The importation of rough diamonds began in 1873 (\$176,426) corresponding with the beginning of the diamond cutting industry in the United States. By 1899, the total declared value of all gem diamonds, rough and cut, imported into the United States had reached -\$17 million, a very significant amount in the currency of the day.

### **THE ECONOMIC IMPORTANCE OF THE UNITED STATES TO THE DIAMOND INDUSTRY AT THE END OF THE 19TH CENTURY**

Clearly, by the end of the 19th century Americans were serious, and increasingly important, buyers of diamonds. It was in this time period that the economic health of the United States had its first major effect on the world diamond industry. Specifically, in the period 1890-1893, the declared value of gem rough and cut diamonds imported into the United States hovered around -\$13-14 million (United States Geological Survey, 1904). This equated to about one-third of the South African (= world) production (Chilvers, 1939), making the United States one of the major diamond consuming nations.

In 1893, however, the United States suffered a disastrous economic depression which lasted for several years during which time declared imports of diamonds dropped to \$4.6 million in 1896. These events prompted Cecil Rhodes, at the sixth annual meeting of De Beers in 1894, to observe that "... during the previous eighteen months America's purchasing power had fallen by 75 per cent" (Chilvers, 1939, p. 271). In 1896 De Beers' mines were operating at "...less than one-half of the company's full productive capacity, the output of diamonds being regulated by the wants of the world" ("The De Beers Diamond Mines," 1897, p. 123). These words were certainly inspired in large measure by the economic events in the United States and were a harbinger of what the diamond industry would cope with during future economic crises in the United States, *e.g.*, the Great Depression of the 1930s. By 1899 the American economy had recovered, diamond imports had accelerated to the -\$17 million level mentioned above, and the framework was in place for the United States to be the decisive factor in the diamond industry in the 20th century.

The rise of diamond acquisition by citizens of the United States appears to have been an evolutionary process and, as such, it is hard to assign a precise starting date. In this situation we are comfortable in agreeing with Lenzen (1970) that the United States began to become a major market (p. 143) "after the American Civil

War," and with Fales (1995) who concluded that (p. 310) "By the 1890s, Americans had become serious buyers of the world's supply of good diamonds." But what is the explanation for the demand for diamonds by the citizens, of all classes, of the United States but not in other, mainly major European, countries?

Numerous authors (e.g., Cattelle, 1911; Winston, 1957; Lenzen, 1980; Shor, 1993) have offered explanations that include: 1) the great prosperity enjoyed by all classes following the opening of the American middle and far west, commencing with the construction of railways and including the industrial revolution; 2) the limited choices of luxury goods; 3) advertising by jewellers in the United States, which soon made the words "engagement" and "diamonds" synonymous; and 4) the absence of a class system, as was the situation in parts of Europe where diamonds were mainly owned by the aristocracy. Further, in the early part of the 20th century, certainly by the 1920s, the rise of the "credit jeweller" enabled working and middle class consumers to buy diamonds "on time" or "on layaway" which greatly increased diamond consumption; some of today's largest jewellery chains, e.g., Zales, began as credit operations (Shor, 1993).

### THE UNITED STATES AND JAPAN AS MAJOR DIAMOND CONSUMERS

A major diamond-consuming nation is here defined as one that annually uses at least 10% of the world's supply, either "By Value" or "By Weight," for a consecutive period of 10 years in the 20th century. The only countries that satisfy this definition are the United States and Japan. During the years before World War I, the important consumers, in addition to the United States, have been variously reported as England, Germany, France and Italy for the period 1899-1902 (Williams, 1906), or Russia, Austria-Hungary, and Turkey and the Ottoman Empire for 1910 (Shor, 1993). However, none of these countries, either individually or in combination, amassed large amounts of diamonds. By 1918 this statement was made: "It is estimated that about half of the mined diamonds of the world are owned in the United States..." (United States Geological Survey, 1921, p.10). From the data presented in this

paper, that statement is equally applicable today (and may even be conservative).

Finally, in the context of the United States and Japan being major diamond consumers, it is worth observing the following statistics for the diamond industry from the beginning (1900) to the end (1999) of the 20th century:

1. The amount of diamonds (gem and industrial) mined: in 1900 = 2.1 million carats (all in South Africa; Levinson *et al.*, 1992); in 1999 = 112 million carats (United States Geological Survey, 2000).
2. The number of countries in which diamonds were mined (in amounts over 10,000 carats): in 1900 = 1 (only South Africa; Levinson *et al.*, 1992); in 1999 = 17 (United States Geological Survey, 2000).
3. The number of countries classified as major consumers of gem diamonds (from this paper): in 1900 = 1 (United States); in 1999 = 2 (United States and Japan).

Thus, whereas the 20th century witnessed a 53-fold increase in rough diamond production and a 17-fold increase in the number of countries in which diamonds are mined, there was only a two-fold increase in the number of countries that can be classified as major gem diamond consumers.

### CONCLUSIONS

The United States has dominated world diamond sales throughout the 20th century by consuming a hugely disproportionate amount of the world's gem diamond production. Although Japan is the only other country to qualify as a major consumer of gem diamonds, and only since 1972, the health of the world's gem diamond industry has been, and continues to be, dependant on the buying characteristics of United States consumers which, in turn, depends on the state of the nation's economy. Currently, the United States and Japan combined consume about 60-70% of world gem diamond production. As new mines are brought into production consideration must be given to this extreme reliance on the economic fortunes of just two countries.

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