

幻彩凝虹——清代宫廷玻璃烟壶

A Dreamy Rainbow: Royal Glass Snuff Bottle of Qing Dynasty

清代玻璃的世界坐标

The world landmark of glass in Qing Dynasty

玻璃，人类最早发明的人造材料之一。无论中国或是西方，玻璃器在古代一直是上层社会的奢侈品。因其制造工艺较为复杂，曾是最昂贵的科技文明。玻璃制品光亮透彻、晶莹剔透的特质，令人无限爱恋，古人曾将之视为无价之宝互为炫耀。

Glass is one of the artificial materials invented by humankind. Whether in China or in the West, glass was always an article of luxury used by the upper class in ancient times. Due to its complex manufacturing process, glass was the most expensive technological achievement. As glass products look clear, translucent, sparkling, and so lovable, ancient people regarded them as invaluable treasures and showed them off to each other.

中国，拥有三千多年的玻璃发展史。虽受到玉器、陶瓷等行业的影响未成主流，但其鲜明的民族特征与独特的艺术风格，在世界玻璃史上深受瞩目。战汉兴盛之后，清代康熙、雍正、乾隆三朝的宫廷玻璃器成为世界玻璃史上的巅峰之作。这些造办处玻璃厂按皇帝谕旨为皇家制造的各类玻璃器，代表了清代最高工艺水平。在当时，玻璃器皿比珠宝还要贵重。从档案中可以看到，清廷每年赏赐达赖、班禅的宝物里几乎都有玻璃类的器物。

In China, glass has a development history of over 3000 years. As baffled by jade ware, ceramics and other industries, glass does not form a mainstream in China, but it is still remarkable due to its distinct folk features and unique artistic styles. After thriving in the war times of Han Dynasty, royal glass works produced in Kangxi, Yongzheng and Qianlong period of Qing Dynasty became the pinnacle of world glass history. The glass factories under the Royal Workshop produced all kinds of glassware for the royal family according to the edicts of the emperor, representing the highest process level of Qing Dynasty. At that time, glassware was more expensive than jewelry. Today, according to the archives of Qing Dynasty, we know that the government of Qing Dynasty gave glassware as rewards to Dalai and Panchen Lama every year.

康乾盛世的玻璃器之所以能达到如此高度，与帝皇的喜爱并为之倾注大量财力精力密不可分。官修文件之光绪《清会典事例》记载：“……康熙……三十五年奉旨，设立玻璃厂，隶于造办处，设兼管司一人……四十九年，设玻璃厂监造二人……雍正……五年议准玻璃厂于拜唐阿内设委署催总一人……六年议准玻璃厂于拜唐阿内增设委署催总一人……圆明园活计库，顶戴委署库掌各四人……玻璃厂，留顶戴副司匠一人，顶戴委署库掌一人……”清宫玻璃厂奉旨

设立于康熙三十五年（1696），由德国传教士纪里安指导主持，厂址位于西安门的蚕池口。雍正年间在圆明园六所建立新的玻璃厂，一直到末代皇帝溥仪时期始终在烧制生产，前期多次扩大规模。

The high level of the glassware manufactured in Kangxi and Qianlong period of Qing Dynasty was mainly driven by the fact that the emperors of Qing Dynasty loved glassware very much and devoted a large amount of financial resources and energy to it. According to *Records of laws and system of Qing Dynasty*, an official file of Guangxu period, “…… in the 35th year of Kangxi period, by observing the imperial edict, a glass factory was established and managed by the Royal Workshop, and then an official was appointed to manage the factory…in the 49th year, two supervisors were appointed for the glass factory…in the 5th year of Yongzheng… it was proposed and approved to appoint a general supervisor for the craftsmen of the glass factory… in the 6th year, it was approved to reappointed a deputy supervisor for the craftsmen of the glass factory…for the labor house of the Old Summer Palace, four deputy officials were respectively appointed to be in charge of the house…for the glass factory, a vice supervisor of craftsmen and a manager of the warehouse were appointed…” In the 35th year of Kangxi period of Qing Dynasty (1696 A.D.), a royal glass factory was established according to the edict of the emperor and was hosted by Kilian Stumpf. This glass factory was located at Canchikou of Xianmen. Later, six new glass factories were built successively during Yongzheng period. Expanded for many times in early stages, these glass factories had been producing glassware until the period of the last Emperor Puyi.

康熙皇帝玄烨是清代皇帝中最喜欢学习西方科学技术的一代君主，曾请南怀仁等多位传教士在宫内讲授科技。玻璃器皿在现代只是一种随处可见的物件，但对于生活在十七世纪的康熙皇帝，玻璃生产还是非常神秘的。如何掌握这种技术，并制造出媲美西方的器物，是彰显大清朝作为天朝上邦的实力象征与政治砝码。也正是因为皇帝对玻璃生产的重视上升到政治层面，才创造出冠绝中西的中国清代宫廷玻璃器。晶莹剔透的玻璃器历经康熙朝的奠定基础、雍正朝的革新拓展、乾隆朝的辉煌发展，成为清代艺术品中的新宠和皇帝重要的赏赐品。Emperor Kangxi, alias of Xuanye, was a great emperor of Qing Dynasty, who preferred to study western science and technologies. He once invited several missionaries including Ferdinand Verbiest to give lectures in the court. Although glassware is very common today, for a Chinese emperor living in the 17th century, the production of glass was a mysterious thing. To master the technology of glass production to manufacture glass products which had the same quality as that of western glassware was a symbol of strength and political stake of Qing Dynasty. It is because the Emperor attached political significance to glass production that the incomparable royal glassware around the world was generated in Qing Dynasty. The crystal glittering glassware experienced the foundation stage of Kangxi period, the innovative stage of Yongzheng period and the prosperity stage of Qianlong period and became a new treasure among artistic works and an important gift given by emperors of Qing Dynasty.

中国第一历史档案馆保存的《造办处各作成做活计请档》（以下简称《清档》），详细记载了自雍正元年（1723年）至宣统三年（1911年）内务府所属造办处日常承领各种活计的档案，

包括金玉作、匣裱作、珐琅作等制作承修事项，当然也记录了玻璃厂制作的情况，是清宫玻璃制作的唯一重要史料。而据《清档》记载统计，玻璃鼻烟壶占到了所有清宫玻璃器的八成以上。因此从这些随身把玩的缩型艺术品，便可窥探中国清代宫廷玻璃器的魅力所在。

In *File of All Handicrafts Produced by Workshop of Qing Dynasty* (hereafter referred to as *Qing File*) kept by the First Historical Archives of China, there are detailed records about all kinds of jobs undertaken by the workshop of Imperial Household Department from the first year of Yongzheng period (1732 A.D.) to the 3rd year of Xuantong period (1911 A.D.), including production of gold and jade handicrafts, cases and paintings and enamels as well as other repairing jobs. Of course, this file also contains records of glass factories, so it is the unique historical material about glass production of Qing Dynasty. According to the statistics of *Qing File*, glass snuff bottles accounted for over 80% of all Qing glassware. Therefore, this portable toy-like condensed artistic form was a peeping hole of the charm of the royal glassware of Qing Dynasty.

千变万化的器物呈色

Ever changing glassware colors

玻璃制品最常见的就是透明色，如果制造玻璃的配料中加入某些金属氧化物，就可以使玻璃着色。玻璃中的着色剂能对投射到玻璃上的白光进行选择性的吸收，从而改变透过玻璃光线的光谱组成，使玻璃显示出各种颜色。显色的强弱与着色剂的种类及数量有关，也与工艺制度有关。例如加入氧化钴后的玻璃呈深蓝色，加入氧化铁后的玻璃呈蓝绿或黄绿色。组成玻璃的各种氧化物，在配料时所使用的一般不是纯氧化物，而是含有这些氧化物成分的天然矿物原料及贵金属，比如天然宝石或黄金等。在配料中还应添加适量其他氧化物，以使玻璃呈色更纯正。

The most common color of glassware is translucent. If some metallic oxide is added to the raw materials of glass, glass will take on a certain color. The colorant in glass can selectively absorb some part of the white light projected to it, so the spectrum of the light through the glass will be changed and the glass will display all kinds of colors. The strength of coloration depends on the type and amount of colorant and the production processing. For example, cobaltous oxide makes glass deep blue; ferric oxide makes glass blue-green or yellow green. Usually, oxides used in glass are not pure oxides but contain natural minerals or rare metals, such as natural gemstone or gold, etc. In addition, it is required to add other oxide appropriately to the raw materials so that the glass color will be purer.

据康熙四十四年（1705年）成书的王世祯《香祖笔记》中记载鼻烟“以玻璃为瓶贮之，瓶之形象种种不一，颜色变具红、紫、黄、白、黑、绿诸色。白如水晶，红如火霁，极可爱玩。”可见清初以玻璃瓶来贮存鼻烟，而且多为单色玻璃器，以颜色和造型传递单纯美感是单色玻璃鼻烟壶最具特色之处，尤为讨人喜爱。

According to *Xiangzhu Notes*, completed by Wang Shizhen in the 44th year of Kangxi period (1705 A.D.), snuff is “kept in glass bottles and these bottles are made into different forms and different colors, like red, purple, yellow, white, black and green. The white bottle looks like

crystal, the red one like a rainbow, so they are so lovely.” It is thus clear that snuff was stored in glass bottles in Qing Dynasty and most of these bottles were made of monochrome glass. Snuff bottles of single colors feature pleasing colors and forms, delivering a beauty of purity.

单色玻璃有“涅玻璃”与“亮玻璃”之分，“涅玻璃”指不透明玻璃，“亮玻璃”指透明玻璃。见于《清档》记载的单色玻璃有亮白、米白、月白、亮黄、呆黄、柿黄、鹅黄、金黄、酒黄、橘黄、蜜蜡色、琥珀色、金珀色、米黄、茶色、亮红、大红色、亮红色、粉红色、金红色、涅蓝、亮蓝、天蓝、深蓝、雨过天晴、紫青、天青、顶元紫、顶元紫青、亮绿、涅绿、豆绿、浅绿、松绿、假松石色、翡翠色、葡萄色、黑等。根据《清档》“雍正六年，三月二十二日据圆明园来帖内称，本月十九日郎中海望奉旨：照先做过的玻璃菊花碟子样收小些再做三十件，烧十五色，每色二件，摆在万字房西一路第七间屋内小洋漆书格上，分摆留落，每落五个。钦此”等资料证明雍正早期就可调配约二十种颜色的玻璃。

Single color glass can be divided into “obscured glass” and “bright glass”. The former refers to opaque glass, the latter transparent glass. According to *Qing File*, the colors of single color glass are various, including bright white, creamy white, pale blue, brilliant yellow, amber yellow, persimmon yellow, light yellow, golden yellow, wine yellow, orange, beeswax, amber, golden, beige, dark brown, bright red, scarlet, shiny red, pink, golden red, pale blue, bright blue, sky blue, deep blue, color of sunshine after rain, purple blue, reddish black, purple, blue, brilliant green, dull green, bean green, light green, green, turquoise, emerald, grape, black, etc. According to records in *Qing File*, “on March 22th, the 6th year of Yongzheng, the Old Summer Palace reported that Assistant Minister Haiwang was given an edict by the Emperor to make 30 smaller chrysanthemum pattern glass dishes as before. These dishes shall be made into 15 colors, 2 piece for each color. After completed, they shall be laid on the small painted book shelf in the 7th room of the first western row of swastika type house, placed into 6 groups, 5 for each group. Hereby you are ordered!” The records above show that 20 glass colors could be made in Yongzheng period of Qing Dynasty.

从颜色来讲，皇家品位对颜色的要求远远超出当时欧洲发达玻璃制造界。除了对红蓝宝石、祖母绿、玛瑙、水晶等宝石颜色的仿制，宫廷玻璃厂在西方传教士和中国最优秀工匠的共同努力下，创造出仿玉、仿琥珀、仿翡翠、仿碧玺、仿青金石、仿松石、仿雄黄、仿鸡肝石等各种仿色的配方，还创造了中国文人寄情于大自然美好景物的雨过天晴、湖水绿、紫青、月白、鹅黄、柿黄、西湖水、西瓜水、藕粉等颜色。雍正朝的玻璃器共有三十多种呈色，可谓缤纷绚丽，成为清朝玻璃制造工艺的闪光点。

In terms of color, the royal taste required much more than Europe then did. Apart from imitating the colors of red and blue gem, emerald, agate, crystal, the royal glass factory, due to the joint efforts of western missionaries and the excellent craftsmen of China, invented various color formulas to imitate colors of jade, amber, emerald, tourmaline, lazurite, turquoise, realgar, chicken liver stone, etc. and also created some special colors which showed Chinese liberators' love of natural beauties, such as color of sun shining after rain, lake green, violet, bluish white, light yellow, persimmon yellow, west lake water, watermelon water, lotus

pink, golden star, etc. During Yongzhen period of Qing Dynasty, there were over 30 glass colors, which were so profound and splendid, making shining points of glass manufacturing process of Qing Dynasty.

求新求变的工艺配方

Novelty aspiration of processing formula

历史上，东西方在玻璃生产中一直使用不同的原料配方，这与呈色审美、因地取材、制造工艺等差异有关。清宫玻璃厂的创建以西方传教士为主导，以广东和山东玻璃匠役为辅，因此玻璃器与元明时期传统的“药玉”大有区别。在皇家巨大财力的支持下，不计成本的进行各类试验，将东西方玻璃配方中的精华进行融合，以盆硝为助熔剂，以硼砂提高耐热度，以砒霜澄清铁氧，最终创造出了纯净鲜艳的清代宫廷玻璃配方。此外，亦成功引入以金显色的金红玻璃，使清代玻璃工艺达到新的高度。清三代玻璃器色彩艳丽纯正，料质净透清澈，气泡少密度高，都是配方改良的显著特征。

In history, westerners and Chinese people used different formulas of raw materials in glass production, which was affected by color generation taste, material sources, manufacturing process, etc. The establishment of the royal glass factories of Qing Dynasty was dominated by western missionaries and assisted by glass craftsmen from Guangdong and Shandong. As a result, glassware of Qing Dynasty was quite different from the traditional “medical jade” of Yuan Dynasty and Ming Dynasty. Supported by the huge financial resources of the royal family, a large amount tests were made without considering cost and the essences of western and eastern glass formulas were integrated to a new process. Mirabilite was used as flux, borax used to increase thermal resistance, arsenic used to remove ferric oxide, which finally created the pure and bright-colored royal glass formula of Qing Dynasty. In addition, ruby glass of golden color was successfully introduced so that the glass production process of Qing Dynasty climbed to a new height. The glass of the periods of three emperors of Qing Dynasty features bright and pure colors, clear and transparent material, few bubbles and high density, showing that the glass formula then was improved.

在皇帝对玻璃器及鼻烟文化的喜爱及引导下，东西方文化与工艺技术的碰撞，淋漓尽致的体现在清代宫廷玻璃鼻烟壶的器形纹饰上。有采用西方十七世纪工艺潮流风格的抽象几何图案，如各种磨棱造型、各色八角玻璃鼻烟壶；又有符合中国文化取向，线条柔美雅致的葫芦形、海棠形、油篓形、茄形、竹节形、卵圆形、鲤鱼形玻璃鼻烟壶；更将中国琢玉工艺引入玻璃装饰中，在玻璃鼻烟壶上雕刻出精美的文字图案，如螭虎纹、夔龙纹、梅蝶纹、万字纹、双福双寿、如意肩、包袱式、节节双喜等传统纹饰。

As emperors of Qing Dynasty loved and promoted glassware and snuff culture, the collision of eastern and western cultures and process technologies was fully demonstrated in the form and pattern of the royal snuff bottles of Qing Dynasty. Some adopted the western abstract geometric pattern of the processing trend in the 17th century, such as grinding edges, octagon glass snuff bottle; some conformed to the Chinese culture taste, including a lot of graceful and elegant forms like gourd, begonia, oil bottle form, egg plant, bamboo, egg, Chinese

character “吉” (ji) form, carp, etc. Moreover, the Chinese process of carving jade was introduced into glass decorations. All kinds of fine patterns were carved on the glass snuff bottles, like tiger, dragon, plum and butterfly, swastika, two Chinese characters of “福” (fu) and “寿” (shou), Ruyi shoulder, bag type, double “喜” (xi) and other ancient style patterns.

为何外国传教士主持下的清宫玻璃厂，出品的器物如此民族化？是因为这些玻璃器完全受皇帝的旨意制造。“雍正三年，谈事录。闰三月初三日，据郎中海望奉旨：朕看从前造办处所造的活计好的虽少，还是内廷恭造样式，近来虽其巧妙，大有外造之气，尔等再做时，不要失其内廷恭造之势。钦此。”可见，雍正朝改进的不止是玻璃器呈色配方，而且对器物的样式风格做了明确的规范，为乾隆朝的蓬勃发展奠定了坚实的基础。

Why the glass factories managed by western missionaries produced glassware of impressive national style? The answer is that all these glassware were manufactured according to edicts of the emperors of Qing Dynasty. “According to Discussion Records in the 3rd year of Yongzheng period, on the 3rd of Leap March, Haiwang, assistant minister, received an edict from the emperor: “I found that there were few fine glassware produced by the workshop before, but they strictly followed the royal patterns. Recently, the glassware is very exquisite, but they are of exotic style. When glassware is manufactured next time, you shall follow our royal style. Hereby you are ordered!” This shows that during Yongzheng period, apart from the improvement of the formula of glassware, their patterns and styles were also clearly regulated, which laid a firm foundation of the prosperous development of glassware in Qianlong period of Qing Dynasty.

除了颜色、纹饰的追求，宫廷玻璃器在工艺上也不断推陈出新。技师们将吹制、刻花、磨琢等玻璃装饰技巧熟练掌握并将之表现的尽善尽美。从史料我们了解到康熙朝已有单色玻璃、画珐琅玻璃、套料玻璃、刻花玻璃、洒金玻璃等品种。雍正朝在前朝的基础上开创了描金玻璃。到乾隆时期，清代玻璃制造达到了最鼎盛的时代，不仅大量制作了套料玻璃、画珐琅玻璃，更是增加了金星玻璃、戗金玻璃、搅玻璃、缠丝玻璃等多种新工艺。

In addition to requirements of color and pattern, the royal glassware process was also gradually innovated. The technicians mastered flowing, design carving, grinding and other glass decoration skills and expressed them perfectly. According to the historical records, a lot of glass varieties like single color glass, painted enamel glass, flashed glass, etched glass, gold spotted glass, etc. were invented in Kangxi period. When it came to Yongzheng period, based on the development of former generation, a new kind of glass, gold glass, was created. Then, the glass production of Qianlong period reached its summit in Qing Dynasty. A lot of flashed glass, and painted enamel glass were made, and many new processes were adopted like aventurine glass, gold inlaid glass, mixing glass, in-painting glass, etc.

就工艺而言，玻璃胎画珐琅的创制是结合中西的技巧体现，在宫廷鼻烟壶中最精致也最具特色。由于玻璃和珐琅二者熔点相近，烧制时必须精准控制温度，过低则发色不佳，过高则导致变形。而且每种颜色釉料的熔点不同，因此一件色彩绚丽的玻璃胎画珐琅器，常需要多次烧制，因其成品率不高愈显珍贵。

In terms of process, glass-body painted enamel reflects the combination of western and eastern skills, and the royal snuff bottle of this glass is the most exquisite and the most unique type. As glass and enamel have similar fusing point, when manufacturing them, it is necessary to control the temperature. If the temperature is too low, the color will be poor; if the temperature is too high, the bottle will transform. Of course, as the melting points of each color glaze are different, a colorful glass-body painted enamel ware shall be burned for many times. As the rate of finished products is low, this kind of glassware is very precious.

清代内廷制造玻璃制品不计成本，但求事成。如乾隆二十一年四月初六日，乾隆皇帝想按照挂在水法殿游廊内的西洋玻璃灯样式，制作四对五色玻璃灯，让太监胡世杰传旨玻璃厂，先画设计图稿并且估价，玻璃厂在七月十九日上奏说：“为成做西洋玻璃灯四对，共约估买办物料、煤、木工价银三千六百二十两一钱零，另缮清单，一并画样恭呈预览等因具奏。”奉旨：“玻璃灯照样准做，其所用物料工价银两，知道了。欽此！”从活计档记录可知造价惊人，制作之间较长。宫廷玻璃器价格昂贵，寻常百姓甚至一般官员可能都无法享受。为了烧炼出色彩丰富、质地精纯的玻璃器，甚至不惜添加黄金、宝石等珍宝，如乾隆十七年（1752年）玻璃厂所用工料清单中有“配玻璃用头等金叶三两”等记录。

在清代最全盛的时局下，宫廷玻璃器以结合中西方的精良配方为原料，借鉴各种珍稀珠宝烧炼出绚丽多彩的颜色，以历代雅玩珍品为范本，将东西方文化审美相融合；以天子万承之尊谕旨造办，指定样式精工细作。即便是一珠一壶，也不得半点草率，充分体现了宫廷审美趣味及科技创新的完美融合。幻彩凝虹，当之无愧！

In the full bloom of Qing Dynasty, by following the best Chinese and western formula to select materials and imitating all kinds of rare jewels, the royal glass factories produced profound glassware of gorgeous colors. By taking elegant treasures and artworks of the past generations as the model, the glassware of Qing Dynasty integrated the esthetic tastes of the west and the east and was carefully manufactured according to the required patterns by the emperors. Even when making a small bead or a small bottle, the glass factory then dare not slack at it, which fully represented the perfect fusion of the royal esthetic taste and technological innovation. Like a dreamy rainbow, the snuff bottles are worthy of savoring carefully!

(完)

(THE END)

征引书目：

张荣，〈清宫造办处玻璃器综论〉，《光凝秋水——清宫造办处玻璃器》，紫禁城出版社。
林业强，〈清宫玻璃厂三题〉，《光凝秋水——清宫造办处玻璃器》，紫禁城出版社。

杨伯达, <清代玻璃配方化学成分的研究>, 《故宫博物院院刊》, 1990 年第 2 期。
张荣, <忽看不似水, 色绝如隔尘——清代雍正御制玻璃>, 《虹影瑶辉 李景勳藏清代玻璃》,
香港中文大学文物馆。
张维用, <明朝内官监、清宫造办处与博山琉璃>, 《冰花楼诗文集》, 远方出版社。

Works cited:

Zhang Rong: *Overview of glassware of the royal workshop of Qing Dynasty, Condensed light in autumn water: glassware of the royal workshop of Qing Dynasty*, The Forbidden City Press.

Lin Yeqiang: *Three aspects of glass factories of Qing Dynasty, Condensed light in autumn water: glassware of the royal workshop of Qing Dynasty*, The Forbidden City Press.

Yang Boda, *Research on chemicals of glass formula of Qing Dynasty*, Journal of the Palace Museum, the 2nd issue, 1990.

Zhang Rong, *Like water like cloud: royal glassware of Yongzheng Period of Qing Dyansty, Elegance and Radiance: Grandeur in Qing Glass The Andrew K.F.Lee Collection*, Art Museum of The Chinese University of Hong Kong

Zhang Weiyong: *Official supervisors of Ming and Qing Dynasty, the royal workshop of Qing Dynasty and Boshan enamel, Binghualou Poem Collections*, Yuan fang Press.