9-8-2008

Chinese Fireworks

Haiwang Yuan
Western Kentucky University Libraries, haiwang.yuan@wku.edu

Firecrackers and Fireworks

The general Chinese term for firecrackers and fireworks is *huapao*, which is a portmanteau of *yanhua* and *paozhu*. *Yanhua* (smoke and flowers) or *yanhuo* (smoke and fire, or colorful fire when *yan* is pronounced in a different tone) refers to fireworks. *Paozhu* (cannon bamboo) or *paozhang* (cannon stick) stands for firecrackers, which used to be called *baozhu* (exploding bamboo).

Origin

Wang Anshi (1021－1086), a great thinker and man of letters of the Song Dynasty, once wrote in a poem: "*baozhu sheng zhong yi sui chu*; *chunfeng song nuan ru tusu*," meaning:

> "Amidst the crackling of exploding bamboo a year is gone;
> In the warmth of a spring breeze we drink the wine of *tusu*."

This well-known couplet vividly described how people of his time celebrated the Spring Festival, or Chinese New Year. What stands out in the line is *baozhui*. In fact, the tradition of burning bamboo to create loud noises as part of Chinese New Year celebrations goes far back in history. Written in the late Western Zhou Dynasty (1046 BC-771 BC), a verse from the classic *Shi jing*, or *Book of Songs*, reads, "*Ye ru he qi? Ye wei yang, tingliao zhi guang* (How goes the night? It's not yet midnight, but *tingliao* is already blazing)." Here *tingliao*, according to historians, refers to a kind of torch made of bamboo, and as it burns, it makes crackling noises.

Why did the Chinese celebrate their New Year with crackling bamboo? Scholars from the Western Han (206 BC -AD 8) through the Southern Song (1127-1279) dynasties all recounted a popular belief that the noises could expel or scare away a mountain demon.

How did the tradition start? According to a legend, on every Chinese New Year's Eve, a monster *nian* would come out of the mountains to prey on humans. A god in the guise of a beggar scared the monster away with the crackling of burning bamboo. Humans then followed his example. *Shen yi jing* (*Book of Gods and Spirits*), a classic of the Han Dynasty (202 BC-AD 220), seems to have given a more practical answer: In ancient times, when camping deep in the mountains, people used bonfires to cook and to keep themselves warm. A strange animal called *shansao*, however, often harassed them despite the fire. It carried a disease that could cause chills and fever. The campers then used bamboo as the firewood. As it crackled while burning, it kept the frightened animal away from them.

History

While burning bamboo was still prevalent during the Southern Song period, people had already begun to stuff saltpeter (potassium nitrate) into bamboo sticks to get more exciting effects as they burned. The discovery of this compound was attributed to alchemists in the 7th or 8th century, who used it along with sulfur and charcoal to produce *dan*, or "pills of immortality."

But with the right ratio of the three components (61.54%, 30.77%, and 7.6%), they chanced to create gunpowder. The lucky person was said to be Sun Simiao (AD 541 or 581-682). Alchemist as well as a pharmacist, he was regarded as the father of gunpowder in China.

Another step was made at the same time when bamboo was used to make paper. Until then, paper, though invented in or even before the 2nd century, had not been affordable to the average Chinese. The Song people rolled sheets of paper into small tubes, stuffed gunpowder into them, fixed a fuse into each, and the first modern-day *baozhu*, or firecrackers, came into existence. They then strung and fused smaller *baozhu* crackers together so they could be set off one by one in close sequence to create continuous explosions. They called this type of clusters *bian* (whip) or *bianpao* (whip cannon). By the time, the military had already employed rockets in battles, and the technology led to the invention of *ertijiao* (kicking twice) or *liangxiang* (sound twice), both referring to cannon crackers. It could be set on the ground or held gingerly in the hand, with the ignition of the fuse, its lower section exploded and produced from its bottom a powerful jet that catapulted the top part into the sky where it exploded again with a loud report that could spread far and wide.

Yanhua, or fireworks, did not become popular until the Qing Dynasty (1644-1911) although there are claims that it had been invented a few hundred years earlier. Some historians ascribe the birth of modern fireworks to Yongzheng Emperor (1678-1735). It was said that in the first year of his reign (1723), he ordered that *huapao* of novelty be made for the coming Lantern Festival celebration. The burden fell on the shoulders of Li Tai, a *huapao* specialist. The stressed Li Tai was relieved when he chanced on the colorful sparks shot out of beaten irons in a blacksmith's. He got the idea of mixing different sizes of iron particles with gunpowder to create the fireworks and propelling them into the sky with saltpeter.

Types

By 1930s-40s, there had been a great variety of fancy fireworks, such as "ground mouse," "swan with eggs," "drops of gold," "turnip flower," "big-leaf orchid," "big-leaf chrysanthemum," "double plum blossoms," "three layers in a row," and "double dragons playing with a pearl."

Fireworks fall into the big categories of *shengkong* (rising into sky), *tuzhu* (spitting pearls), *penhua* (throwing out flowers), *shizhuan* (turning and spiraling), and *xianxiang* (ignited while hanging). And they are subdivided into over a thousand different types. Take the *shengkong* category for an example. There are fireworks that can rise to different heights and those mixed with firecrackers or equipped with parachutes.

Production

Fireworks consist of combustibles (powders of aluminum and iron), flash and sound compositions, and glue (usually natural resin and dextrin). The compositions are rich in potassium chlorate, antinomy sulphide, potassium perchlorate, and potassium benzoate. The

production of fireworks involves a complex process of composition grinding, sifting, drying, purifying, mixing, granulating, and pressing.

Early in the mid 18th century, Liuyang County of Hunan Province had become a center of *huapao* (firecrackers and fireworks) production, with the capacity of producing 140,000 cartons a year. Today, there are over 7,000 factories in the business with about 1,000,000 employees. They are mostly in the provinces of Hunan and Jiangxi.

Market

Not only is China a birthplace of *huapao*, but it's also the largest producer and exporter since 1860s. Statistics show that in 2005, China sold 13 billion RMB yuan (over 1.8 billion U.S. dollars), a third of which from exports to over a hundred countries. That amounts to 90% of world's production of, and 80% of world trade in, firecrackers and fireworks.

For safety reasons, most Chinese cities banned firecrackers and fireworks in the 1990s. With the rise of national pride amidst economic success, the mounting cry for respecting traditions lifted or partly lifted the ban in nearly all the cities, thereby reopening up a large domestic market. To promote more international trade, Liuyang, a stronghold of China's *huapao* industry has held the Liuyang International *Huapao* Festival every other year since 1990.

Challenges and Possible Solutions

The Chinese *huapao* industry still faces a number of challenges, such as poor management, small-scale production, substandard technology, deficient training mechanism, and weak pollution control. As a result, fatal accidents occur frequently. From October to November in 2007 alone, 86 people died in 12 accidents. The fire that reduced a huge storage hub in Foshan City, Guangdong Province, on February 14, 2008 proved devastating to the industry throughout the country.

Efforts are being made to build better storages and plans are being developed to produce smokeless, nontoxic, pollution-free, low-noise, non-combustible products that will be both safe and entertaining.