Nanfeng Dragon Kiln

Shiwan, Foshan district, Guandong Province, China
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The ancient Chinese potters were masters at transforming raw clays and minerals into utilitarian ceramic articles and exquisite works of art through the controlled use of heat in the process known as firing.

As an industrial ceramist I understand and can explain the technical side of how this transformation takes place. I can go on at length about how alumino-silicate based clays and minerals can be made to combine at high temperature with natural occurring fluxing minerals to form the hard, vitreous and glassy covered ceramics which we see in our everyday lives as articles of tableware and cookware, floor and wall tiles, bathroom sanitaryware and decorative household ornaments.

What I find less easy to put into words is the feeling I get when having placed a hand-made and glazed clay ceramic article into a homemade kiln - the term for a high temperature oven – and impatiently waiting for the kiln to cool down I can snatch that article out of remnant heat to see how it has been transformed by the firing process.

Sometimes the result is not what I was looking to achieve, often disappointing, often frustrating, but just occasionally, what I take out of the kiln is a piece of such artistic beauty or of such a technical achievement that I can only compare the firing process to an act of alchemy and it leaves me, quite frankly, amazed, delighted and extremely satisfied.

Viewing the work of other ceramists is something I never tire of, especially when there is an opportunity to talk with them and learn from their knowledge as well as share with them my own experiences.

Such an occasion took place during my first visit to China where, as part of a business trip, I found myself quite by accident in the town of Shiwan, home to of one of the most famous examples of the Chinese ceramic tradition, the Dragon Kiln.

So, what is a Dragon Kiln?

In this presentation I'll attempt to answer this question and I'll keep the explanation as non-technical as possible.

Courtesy of photos of models of dragon kilns, exhibited in the Shiwan cultural site museum I'll briefly describe how these kilns work and what makes them so special.

I'll then show a series of photos I took during my visit to the center where I was fortunate to have a personal guided tour by one of the center's young trainee potters and also meet up with one of the master potters and talk with him about how the produces his pottery at the center.

If some of my photos in this presentation look a bit drab this is because the weather turned overcast for my visit and it rained most of the time I was at the site. Nevertheless, whilst my photos were a little off the weather did absolutely nothing to dampen my tour of this incredible example of Chinese ceramics cultural heritage.

I'll finish this presentation with an image of an article I bought in the site gift shop, a simple tea bowl with an absolutely gorgeous rich iron red glaze which I'd practically give my left arm to be able to produce in a kiln of my own design. Some day ....

So, to begin, a brief introduction of the Nanfeng Dragon Kiln abstracted from the internet.

- The ancient Nanfeng Kiln, where the pottery art of Foshan originated, is located in Shiwan Town, Chancheng District of Foshan City. Being the oldest kiln of China, the history of the kiln can be traced back to the Ming Dynasty (1368-1644).
- According to historical documents, the city became a ceramics base during the Tang (618-907) and Song Dynasties (960-1279). In the Ming (1368-1644) and Qing Dynasties (1644-1911), the ceramics were highly developed and the pottery of Shiwan Town achieved national fame. The 'Dragon Kiln' played a dominant role among the kilns of Shiwan Town. Such a kiln is always built against a hill and winds its way along the slope, resembling a gigantic dragon. The Nanfeng Kiln is the most ancient one of the three existing Dragon Kilns.
- Although production has never stopped, the antique kiln is well preserved. It is rarely found in China or indeed in the rest of the world, and the kiln is considered as a 'live cultural relic'. The mouth of the ancient Nanfeng Kiln faces south and a giant banyan tree gives a pleasant shade at the end of the kiln. In summer, there is always a good breeze; therefore, the kiln gets its name 'Nanfeng' which means south wind. It is considered miraculous that the 400-year-old banyan tree can survive in such high temperatures and in such an infertile location and it is considered to epitomize the heart and soul of the dragon kiln.
- Watching the process of making pottery is fascinating. When timbers are put into the kiln, the burning kiln looks like a firedrake falling from heaven and the temperature can reach up to 1,300℃ (2,372 F). In the Nanfeng Kiln, the traditional pottery making techniques live on. Temperature control is practiced by the skilled workmen according to their experience instead of modern apparatus. It is astonishing that each piece of pottery made is unique even if they come from the kiln at the same time. The instability of temperature of the wood-burning kiln brings in the variety of the products and some of them are rare and precious.

‘*abridged and modified extract from a Chinese Travel Guide*’

Simplistic model of a typical dragon kiln

The Nanfeng kiln is set at a considerably steeper angle and is longer than this model portrays

My explanation of the dragon kiln – this is a variety of 'climbing' kiln designed by centuries old pottery communities in China as a means to fire vast quantities of ceramic articles produced by family potters within the community.

The kiln consists of a long arched-roof tunnel built up the slope of a hillside – the reason these kilns are know as climbing kilns. This tunnel has a lower entrance, a fire hole or fire box, into which pine wood is burnt to raise the temperature of the kiln. The heat from the entrance rises up through the tunnel to the base of a chimney at the far end and highest point of the kiln through which it escapes creating a natural draft to pull more heat through the kiln tunnel.

The temperature in the kiln is controlled by the amount of wood being fed into the firehole, by a damper at the base of the chimney controlling the escape of heat to the atmosphere and by the constant introduction of thin laths of wood through a number of fire holes situated along the length and width of the arched roof. A kiln firing will last 24 - 36 hours with the temperature inside the kiln reaching 1300 ºC (2,372ºF).

Articles to be fired are placed into and taken out from the kiln through a number of side entrances along it's length which are bricked up during the firing process.

Cross-section of a dragon kiln firing tunnel.

Ceramic articles are stacked inside the kiln, often inside protective refractory containers known as saggers, which prevent wood fed through the roof of the kiln from dropping onto the clay articles and damaging them.

Dragon kilns hold a vast amount of ceramic articles and were traditionally used to fire everything from utilitarian cooking or storage items to purely decorative items, large and small.

Articles are made from locally sourced plastic ‘moldable’ clays mixed with finely ground sandstone. Highly resinous pine wood from nearby forests is used to ‘fire’ the kiln up to its peak temperature at which point the minerals and clays from which the pottery is made fuse and transform into a hard, dense and vitreous ceramic known as ‘stoneware´.

Traditional village ceramics rarely have a covering glaze deliberately applied to the pottery article. Instead the firing process itself develops a thin glossy patina to the surface of the articles, produced by the interaction at the peak firing temperature of the vitrified ceramic with metallic fluxes in the burnt ash of the pine wood used to fuel the kiln. Due to the random nature of this interaction no two pieces of pottery fired in the kiln are ever alike, varying in degree of gloss and of color tone.

Dragon kilns were often stacked with product over a several week period until full, after which firing would take place over 1 – 3 days dependent on the length of the kiln.

Entrance to the Nanfeng Kiln site

The cultural heritage site of the Nanfeng Kiln and its associated ceramic training center and museum is located in the center of Shiwan town, in an area surrounded by shops selling ceramic articles made in the numerous potteries, large and small, located in the Foshan area. The site showcases two dragon kilns, the Nanfeng Dragon Kiln and the High Kiln

Originally the 2 kilns standing at this site would have been built on one of a number of similar sized small hillsides in the area. In its heyday the locality boasted up to 400 working dragon kilns producing prodigious quantities of ceramic ware which was traded throughout China and neighboring countries. Nowadays it is somewhat curious to see the center surrounded by multi-storey office blocks and home dwellings with barely a hill in sight!

The site is open to visitors 7 days a week and for a small entrance fee of 25 Yuan (4 USD) visitors can take a trip back 500 years into the past.

On either side of the main entrance to the site are 2 imposing walls made from large refractory bricks, a number of which are sculpted with amusing figures of overly rotund Chinese deities in cheerful poses.

The term refractory means ‘able to withstand high temperature without fusing or melting’. The same material used to make these bricks is used to make the wall and roof arch of the dragon kiln, to line its floor, and to make the saggers into which ceramic articles are placed during the firing process.

A walk through the main entrance brings the first sight of the two Dragon Kilns.

The High Kiln on the right is a showcase kiln, no longer in use, serving solely for demonstration purposes for visitors to the center.

The Nanfeng Kiln on the left has been in continuous use for the past 500 years and although it has had parts rebuilt many times over the centuries it continues to be fired once per month and is the oldest continually firing kiln of this type in China.

The red figures on the steps in martial arts pose depict Bruce Lee, the world famous martial arts star and actor, who was born in this area. Prior to my visit the center had hosted an exhibition dedicated to him

The approximately 100 ft long working Nanfeng Kiln is a mirror design to its partner the High Kiln.

At the entrance to the kiln stacked pine wood lengths can be seen ready to be used to fire the kiln.

At present the kiln is fired once per month using exactly the same technique developed five centuries previously and its operation relies purely on the knowledge and skill passed down through generations to the master kiln fireman of the center.

This side view of the High Kiln shows the climbing nature of the dragon kiln which is covered by the stepped roofing sections to protect the kiln roof from the elements.

The kiln is open along its length for inspection by the public and by following it from the lower end to the chimney end one can not only appreciate its size but also it's construction and how it works, as shown in the following slides.

The large Banyan tree growing at the far end of the showcase kiln has its roots growing directly out of the porous sandstone side walls supporting the kiln from which the tree derives needed moisture and nutrients.

Most Chinese tourist sites have minimal information in English, fortunately the Nanfeng Dragon Kiln site is an exception and the translations are very good – saving me some writing!

A tour of the High Kiln starts at the lower and business end of the firing process, i.e. the firebox and kiln mouth.

Beginning with small strips of lighted kindling followed by lengths of stouter pine wood logs fed through the two small arched openings into the firebox of the kiln, the temperature in the kiln is gradually built up.

As the highly resinous pine wood burns to a high temperature a good proportion of the ash produced falls into lower ash pits from where it can be raked out during the firing process. Part of this ash is also sucked through the kiln by the flames and flow of hot air rising up towards the kiln chimney and passes over the surface of the clay articles with which it reacts to form a glossy patina finish. As the flames lick the surface of the ceramic articles they also influence their fired color. Where flames directly make contact with the normally beige colored ceramic body they darken its color to varying shades of orange brown.

The temperature of the kiln is assessed visually by the kiln fireman by judging through spy-holes in the walls of the kiln during the firing process how red or red/white is the appearance of the inside of the kiln as the temperature rises.

Along the kiln’s length on alternative sides of the tunnel are situated a number of side entrances. Ceramic articles to be fired are loaded through these entrances which are then temporarily bricked up with refractory blocks during the firing process and opened up again after the firing finishes to remove the cooled ceramic articles.

Bundles of thin laths of pine wood can be seen stacked along the kiln’s length ready to be introduced into the kiln during firing through the purpose made holes in the arched roof.

In this side entrance, located further up and on the opposite side of the kiln, can be clearly seen a number of refractory saggers into which the ceramic articles are placed. The external coloration of the saggers is caused by years of ash deposits falling onto the surface during repeated kiln firings.

The holes in the side of the saggers, along with deliberate gaps left between them as they are stacked allow some of the flames and ash to penetrate into the saggars and make contact with the ceramic articles creating burn patterns on the clay surfaces and the chemical reaction between the ash and the ceramic body which gives the glazed patina to the surface of the articles.

Occasionally items will have purpose made glazes applied to them prior to firing but usually this is not the case.

This photo taken from two thirds of the way up the length of the kiln above the roof shows the fireholes, called *Xiahou*, through which the thin laths of pine can be introduced into the kiln as the firing progressed.

These holes have removable refractory plugs placed in them to prevent the escape of heat from the kiln as the temperature is built up during the firing process. They also serve to release hot air from the kiln during the cooling down process once the firing is completed.

This view taken from the roof of the kiln looking up towards the end of the tunnel where the chimney is located gives a true impression of the inclination of the kiln when compared to my tour guides standing next to it.

The lady on the left in the striped dress, Chen Chen, is a young potter who has been working at the site for the past 5 years learning the skills of the local artists as practiced throughout the centuries.

Next to her is Johana, an export sales manager in one of the factories that supplies glass mosaics to the company I work for. She previously worked at the site for 5 years as a tour guide and it was in an incidental conversation with her during a visit to her factory that I learned of the location of this site and was invited to visit it.

To the right is my work colleague, Jackie, a much needed translator and knowledgeable companion during my business trip to China.

Further up the kiln is another side entrance where visitors can walk into the tunnel and view the inside of the kiln.

In true Chinese decorative fashion a number of saggers inside the kiln are decorated with sprays of artificial cherry blossom - items that wouldn’t survive a second during the real life firing of the kiln!!!

I don’t think you need to be a linguist able to read Chinese symbols to know that the sign above the door probably reads ‘ Mind your head!’

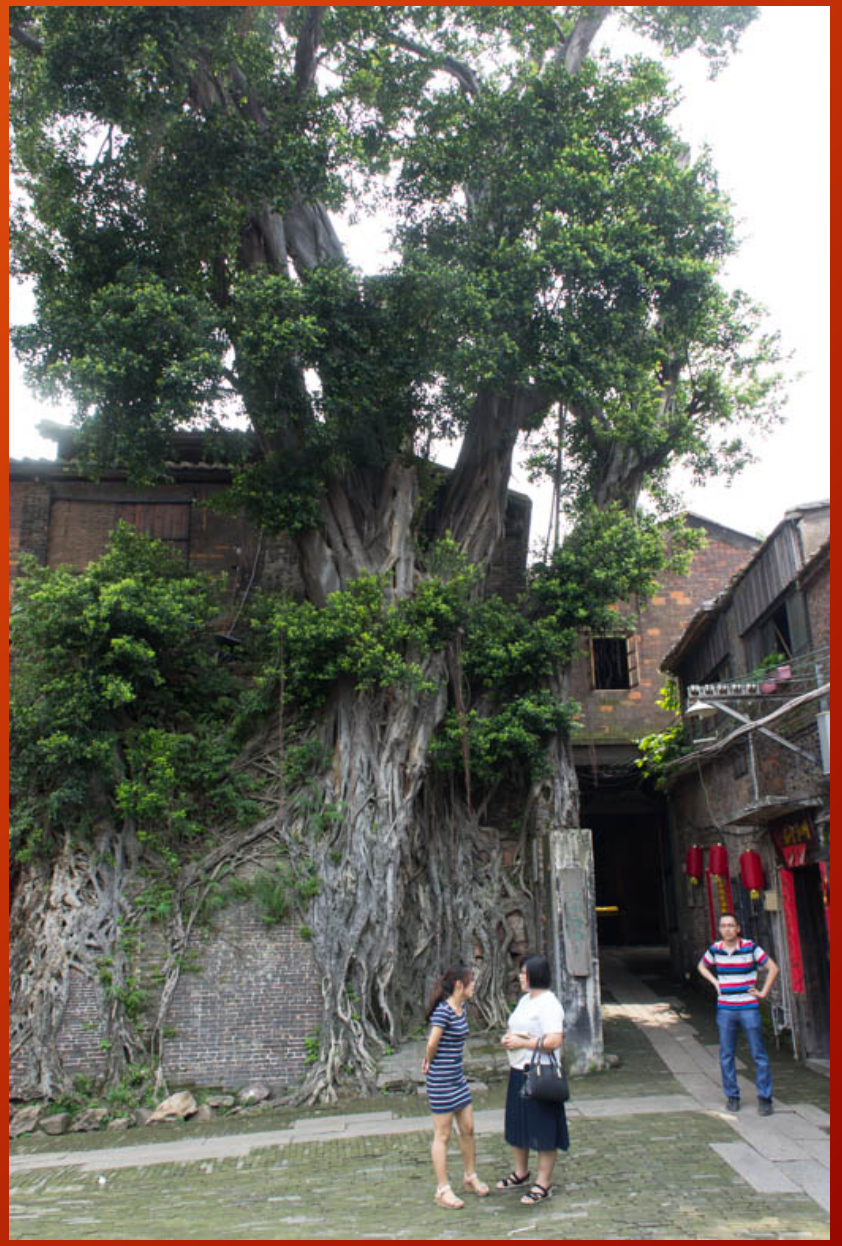
This photo of Chen Chen and Johana standing inside the kiln tunnel gives a real sense of just how large these dragon kilns are.

I was very surprised on entering the kiln to see just how cavernous it was. Seeing the kiln from outside where a large proportion of it is encapsulated by its surrounding walls and is sunk into the original hillside its difficult to imagine just how big it is internally and how much product would be needed to fill it prior to each firing.

After exiting the kiln tunnel we descended a flight of stairs and passed around the base of the kiln chimney to what would have been the base of the hill upon which the kiln was originally built.

Access to the chimney base itself was restricted and as it had just started to rain again we decided to seek shelter in one of the building surrounding the kiln, but not before pausing to look at the 400 plus year old banyan tree growing straight out of the limestone blocks supporting the kiln wall!

The constant humidity of the climate in this part of China no doubt has helped this magnificent tree to not only survive but to grow to a prodigious height, easily dwarfing the tall chimney of the kiln which can just be seen behind it, however, the nutrients needed to feed it during its growth have been extracted over the years from minerals in the very porous sandstone blocks used to build the kiln wall. A truly amazing example of nature prevailing in a seemingly impossible environment!



This final image of the High Kiln shows again the inclination at which the dragon kilns were built and, in the case of this particular kiln, the superstructure of the buttressed walls supporting the main kiln tunnel and its protective roofing buildings.

One has to wonder if the roots of the banyan tree will eventually cover all of those blocks….. Maybe after another 5 centuries!

After completing the tour of the High Kiln I was introduced to one of the master potters at the site and with the help of Johana as translator I was able to learn the history of how the pottery community in the Forshan district developed over the years, from where the local potters obtained the clays and minerals used in their craft and how these same materials are used to the present day.

I was invited back to the site at any time of my choosing to make a pottery article there and have it fired in the Nanfeng kiln as a lasting memento of my visit - an offer I hope I can take up in the not too distant future.

Naturally I had to have my photo taken with the master potter and his family!

My visit finished with an all too brief look at the very large ceramic museum on the site, along with a visit to a showcase area displaying articles made at the center and including a demonstration by a group of ladies producing delicate montages of extremely small figures in a process known locally as ‘microfiguring’.

I was also invited to Chen Chen’s small pottery studio to view her work and try my hand at throwing an article on her potter’s wheel . This resulted in a total failure but proved at least that I could still almost dominate a fast spinning ball of clay between my hands!!!

The time consuming and painstakingly detailed work of Microfiguring

As for trying my hand at throwing a pottery article, well I'm not about to show anyone the results of my failure to produce a sound piece. However, to my surprise my attempt was captured on camera by Jackie who emailed me this image a couple of days after the visit.

I guess the expression on my face tells all!

So much for the forum acronym of NPDH – No Photos, Didn't Happen! I have the evidence - ☺

To end this presentation, here is the small bowl I purchased from the site gift shop which now commands a treasured spot in my small collection of ceramic articles – *3.25" diam. X 2.74" ht.*

I hope you enjoyed this tour of the Nanfeng Dragon Kiln Cultural Site - Jim Moss ☺