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**Chelsea Physic Garden though the ages**

Michael Holland

Hello, my name is Michael Thomas Holland FLS and I am Head of Education at Chelsea Physic Garden. I have been working there for 21 years and originally studied for a BSc in Ecology at Lancaster and Oregon State Universities before becoming involved with environmental education for which I still have a great passion.

This will be a talk as much about technology and innovation as it will be about people and plants, but it will be all centred on one place – Chelsea Physic Garden. Having said that, there will be a few key international excursions along the way too which link to the Garden’s long history, characters and the origins of some of its plants.

Chelsea Physic Garden’s 343 year history spans **five** centuries and I will give a summary each of these as well as highlight **five** notable people and, of course **five** useful plants that are somehow linked to those people to help tell this story. Plus they are all plants which are still grown at the Garden. The narrative pathways I could take are almost infinite and I am certainly missing out a myriad of notable people and plants, some of which will be in ‘soft focus’, but this is a version of the Garden’s history. Any one of these 15 landmarks could fill a lecture such as this.  So, just to recap, there will be 15 landmarks plus the following preamble...and a brief look beyond.

The Apothecaries of London were originally members of the City Company of Grocers but were granted independence by James I in 1617. By 1632 they had set up shop in Blackfriars in the City of London, and eventually became the largest of the Livery Companies. Their headquarters were destroyed by the Great Fire of London, which they probably did not think was all that great. In 1673 they established a new site a few miles upstream in the village of Chelsea or Chelsey.

Incidentally, the word ‘apothecary’ derives from ‘apotheca’ which was a store for spices and herbs. Apothecaries needed to be able to identify the herbs they would be purchasing to mix their products and thus avoid adulteration, poisonings or ineffective treatment.

The Garden was formed at a point in history where the understanding of the human body and the nature of medicines were in transition – with superstition entwined with religion and beliefs in alchemy were giving way to actual science. Despite doctors being required to study at a university to qualify as early as the 13th century in Europe, this did not ensure they had the ability to effectively cure their patients and indeed even into the 17th century many trained doctors  felt they were above actually touching those in their care. Some surgeons moonlighted as hangmen and their equipment and methods might be very similar to that of a torturer.

The ‘seedling’ Garden (approximately 4 acres in size) was founded on the site of previous market gardens and served three purposes. 1. It provided a base for the Apothecaries’ barge as well as those of the vintners, goldsmiths, skinners and tallow chandlers (who paid rent). From here the Apothecaries and their apprentices could conduct ‘herborising’ expeditions to adjacent sites such as Battersea and Putney Heath for botanical training. 2. It provided a site for the growing of plants used in medicines - it did and still does benefit from a gently south-facing slope with a sandy soil (which favours Mediterranean type plants), and having many of these plants gathered on field trips and elsewhere did make the study of them more convenient.  3. As importantly it was useful for correct plant identification by the Society’s apprentices. It would be unwise to spend all that time studying how to heal people and then poison your first patient with a plant that looks a bit like a non-poisonous one. [With many 21st century pharmaceuticals, many of the most effect medicines are indeed the most poisonous plants.] So it was a Garden above all for training and still serves this purpose. I am thoroughly proud to be ‘Head teacher’ at what we now call ‘London’s oldest outdoor classroom’.

**17th Century: beginnings
John Watts, Curator/Director from 1680-1692/3**

A merchant apothecary by trade,  John Watts was appointed to order, manage and care for the Garden in January 1680 at a salary of £50 with two gardeners and with the remit to plant ‘with foreign as well as native plants’ which he did make a good start on. It was due to Watts that the Garden first developed its international links after he was visited, in 1682 by Dr. Herman, Professor of Botany at Leyden who suggested a plant exchange of some sort. Watts then went to Holland to start this exchange of genetic material and no doubt valuable awareness of the young Garden itself. This trip was extremely important in initiating the international botanic garden seed exchange (*Index Seminum*) system which still exists today - with seeds being sent to hundreds of other gardens and universities worldwide.

Hans Sloane (who was a student there at the time) wrote to John Ray, on 11 November 1684, telling him how Mr Watts *‘has a new contrivance, at least in this country; viz. he makes under the floor of his greenhouse a great fire plate, with grate, ash-hole etc, and conveys the warmth through the whole house, by tunnels; so that he hopes, by the help of weather-glasses within, to bring or keep the air at what degree of warmth he pleases, letting in upon occasion the outward air by the windows. He thinks to make, by this means, an artificial spring, summer and winter’.* One of the plants that Watts cultivated would certainly have appreciated this new technology since it was so far from home- more about that in a moment.

In February 1687/8 astronomer Edmond Halley related to the Royal Society an observation made by John Watts: *‘that a bell-glass being whelmed over a plant and pressed down hard that there shall be very little if any communication with the outward air, the plant shall notwithstanding grow and thrive rather better’* [we’ll hear more about this phenomenon in about 140 years] and then ‘but if brown paper or any other non-transparent things be pasted on the same glass, the plant shall turn white and wither, and in a little time die, whence he conceived it was necessary to the maintenance of vegetable life that light should be admitted to the plant’. This revelation seems so obvious to us, but such is the nature of scientific discovery and hindsight.

By 1692 he had clearly lost interest in the Physic Garden and was trading plants in faraway lands and reportedly had not turned up to work for a ‘quarter of a year’. I am occasionally late for work due to the Victoria line being delayed, but 3 months late is clearly unacceptable. He soon stepped down, but had left his mark, in a good way.

**Quinine - Cinchona spp.**

The diarist John Evelyn came to look at the new greenhouse in 1685 and commented on Watts growing ‘the tree bearing the Jesuits’ bark’ (the source of the scarce and expensive anti-malarial quinine). He wrote in his diary of 7th August that *‘what was very ingenious was the subterranean heate conveyed by a stove under the conservatory all vaulted with brick so as he (Watts) has the doors and windows open in the hardest frosts, secluding only the snow’.*

It is naturally found in Andean tropical forests and is in the Rubiaceae family along with coffee and madder. Linnaeus named the genus in 1742 after the Second Countess of Chinchón, the wife of a viceroy of Peru. According to some accounts, she suffered from malaria and was cured by a botanical remedy made of the powdered bark of a native tree.

The Quechua Indians of Peru called it ‘the bark of barks’ or ‘quina quina’, due to its healing properties. They generously divulged its secrets to the Jesuit missionaries around 1650, not knowing the demand for its medicinal properties in outside world which would eventually led to its collection almost to extinction. One of the ailments it could cure was malaria. The term malaria originates from Medieval Italian: mala aria—"bad air"; the disease was formerly called *ague* or *marsh fever* due to its association with swamps and marshland. It used to be rife in Europe and North America. Oliver Cromwell died from this disease and perhaps could have been saved if he had not refused the Jesuit’s (catholic) bark.

Cinchona bark became scarcer and scarcer (partly due to it being stockpiled by those with knowledge of its whereabouts, connections and money, such as Hans Sloane). During an attempt to synthesise quinine using coal tars in 1856, a young Englishman William Perkin accidentally made a synthetic dye he called ‘Mauveine’ or ‘aniline purple’ and retired very well off indeed.

The popular Gin & Tonic cocktail was introduced by the army of the British East India Company in India where malaria was a persistent problem. British officers in India in the early 19th century took to adding a mixture of water, sugar, lime and gin to the quinine in order to make the drink more palatable (as the powdered bark is one of the most bitter flavours ever).

**18th Century: correspondence, experiments & exchanges
Philip Miller Gardener from 1722-1770**

Miller was a Scotsman from a gardening family and was appointed by Sir Hans Sloane. Under his care and expertise ‘the apothecaries’ garden at Chelsea became the most richly stocked botanic garden in Europe and a hub of information gathering and sharing, both nationally and internationally. The Garden became the horticultural *Google* of its day.

In 1736, a 29 year old Carl Linnaeus visited the Garden to meet with Miller to attempt to persuade him to adopt the ‘new’ binomial system of botanical nomenclature and the sexual approach to plant classification that he was so keen to catch on in the scientific world. Miller was initially neither taken with the young Swede’s attitude nor his ideas, but after almost 30 years Miller realised Linnaeus’s wisdom and did adopt the ‘new’ system.

The 1st volume of Miller’s Gardeners Dictionary was published in 1731 and the 8th (which weighed about 8kg) in 1768. These were guides on how to garden and therefore made these skills accessible for the first time to ordinary mortals, not just academics and professional gardeners. Financially, even more so when they were published as abridged versions from 1735. They included; personally tried and tested practical tips on kitchen gardening with the seasons, fruit pruning methods, propagation, flower gardening, wilderness creation, pineapple cultivation, greenhouse and even stove construction. They featured botanical jargon, plant anatomy and introduced a myriad of previously unknown species from the furthest stretches of the known world. [Inspired to do the same by Hazel Le Rougetel, Miller’s biographer, by way of tribute, this transcript is written in Garamond -the same font - as Miller’s dictionaries.]

Miller was shaped and influenced greatly by those around him, and in turn influenced the botanical world, in terms of horticultural expertise, variety, insight and knowledge to this day.
I will in passing mention that Miller had, amongst other things, a passion for cultivating roses, but the next plant is an altogether world changing plant, without which you might be naked, or at least semi-clothed.

As well as appointing Miller, becoming landlord to the Apothecaries and making sure we only pay £5 rent per year for ever (as long as we teach about ‘useful’ plants), introducing the idea of milk chocolate to Europe (allegedly) and collecting enough artefacts in his 92 year long life that they became the nucleus of the British Museum, Sir Hans Sloane had dealings in the American colony of Georgia and called upon the expertise of Miller to provide the plants of Cotton - Gossypium spp.

**Cotton - Gossypium spp.**

In the Mallow family along with hibiscus, hollyhocks and cocoa, cotton is a remarkable plant. The fine threads of its fruits or bolls are individual cells, 2000 times longer than they are wide. Cottonseed oil is used for cooking and in products like soap, margarine, emulsifiers, cosmetics, pharmaceuticals, rubber and plastics. It is also used in textiles, thickening drinks, chewing gum, banknotes, sausage skins, paper, explosives and the manufacture of celluloid for the earliest cinema films by pioneers such as the Lumiere brothers. A most up to date use is the poisonous gossypol from its seeds which inhibit sperm production and therefore a potentially useful male contraceptive pill, under trial at the moment.

In the early 1700’s  there was a period where cotton was banned in England due to the silk and wool workers kicking up such a fuss about their livelihoods being threatened by this ‘new’ fabric. It was more comfortable, fashionable and affordable so they had just cause to be worried. Moralists agreed that Eastern luxuries, and cotton textiles in particular, corrupted the moral fibre of society and made a mockery of the “strange Trollops in Callicoe Gowns”, as a 1703 comedy at the London Royal Theatre called such plebeian women wearing colourful Indian cottons.

The fibres are so tightly packed onto each of the tough seeds that extracting them was quite time consuming.  [I have tried it myself, but for the opposite reason; to obtain the seed to grow the plants and therefore remove as much of the fibre as possible to make germination easier.] Various contraptions and machines were devised to make the industry more efficient, including one of the most significant, in 1794, a ‘cotton gin’ (short for ‘engine’) by inventor Eli Whitney. A single cotton gin could generate up to 25 kg of cleaned cotton daily. This contributed to the economic development of the Southern states of the United States, a prime cotton growing area; some historians believe that this invention allowed for the African slavery system in the Southern United States to become more sustainable at a critical point in its development. Some also say that this invention unintentionally led to the American Civil War, but that is perhaps a subject for another talk.

More chemicals are sprayed on cotton than any other crop. It accounts for less than 3% of the planet’s farmed land, but uses about 25% of its pesticides. This is largely due to the veracity of the cotton boll weevil. Definitely the greater of two evils.

Back to the 18th century briefly...

Miller was a hard act to follow and towards the end of the 1700’s William Forsyth (great great great grandfather of entertainer Bruce Forsyth) found the Miller-created momentum of incoming international plants flooding to the Garden quite overwhelming.

A rock garden, one of Europe’s first, was built in the1770’s with basaltic ballast from one of Joseph Banks’s voyages, fused bricks from Chelsea pottery kilns, flint and parts of the Tower of London; it still stands towards the centre of the garden to this day.

**19th Century: empire building via innovation
Nathaniel Bagshaw Ward - member of the Garden’s management board from 1833.**

Necessity is the mother of invention, but so too are accident and serendipity, it turns out.
Nathaniel Bagshaw Ward lived in Wellclose Square in what is now Tower Hamlets and practised in that area, a stone’s throw from the Tower of London and St. Katherine’s Dock. In those days this would have been a heavily industrial area with ships and chimneys bellowing out all manner of toxic coal smoke and therefore unsuitable for growing many plants outside. Dr. Ward's modest garden in London was only barely successful, with few if any of his ferns surviving.

He was an amateur entomologist and botanist and took trips to the countryside to collect specimens to observe at home. On one excursion, around 1829, Dr. Ward collected the pupa of a sphinx moth which he brought home along with some of the soil around it and kept it in a sealed jar. After some time he noticed that a fern and some grass had started to develop in the soil at the base of the jar and thrived for years without any external air getting in. The water inside the jar carried out it very own water cycle as if a miniature world of its own.

In Ward’s words: *‘I observed the moisture which during the heat of the day rose from the mould condensed on the surface of the glass and returned whence it came thus keeping the earth always in the same degree of humidity’.*

No mention of the moth which undoubtedly ended up with a pin through its abdomen as was the way in the Victorian era.

Ward hired a carpenter to build a case for further experimentation. He specified that the frame was to be built as tightly as possible, with the hardest of woods to resist decay from condensation, and soon the first 'Terrarium' was born. In July 1833, he conducted his first major experiment by shipping two custom built cases filled with a number of native British ferns and grasses to Sydney, Australia. After six months on the high seas, the cases arrived in Sydney Harbour with all the plants alive and thriving.

Michael Faraday lectured to the Royal Institution on the new Ward’s invention in 1838 and Ward published his experiment and followed it up with a pamphlet in 1842, On the Growth of Plants in Closely Glazed Cases. So, via accident and curiosity led to one of the most important botanic/economic discoveries of the Victorian age, the Wardian Case.

Curator Robert Fortune was not with the Garden long as he was poached by the East India Company to take on the huge task of transporting 100,000 germinating tea seedlings from China to India to establish the tea industry there; the first use of the Wardian Cases on a commercial basis. They were used globally until air freight in the 1950’s became a more viable option.

As a board member, Ward was extremely supportive of Thomas Moore the Curator in reviving the Garden after the Society of Apothecaries nearly abandoned it in the 1850s.

Due to an increase in road traffic the Chelsea Embankment road was built in the 1870’s and altered the layout of the Garden and increased its size, slightly.

Despite poor standards horticulturally at the Garden there was an increase in teaching. In 1899 it was taken over by the City Parochial Foundation.

Linking to Ward and his discovery, I could have chosen rubber, quinine, pineapples, tobacco, cork, cinnamon, ginger, indigo or ferns, but due to its empire building capacities, its continued popularity and the fact that it is a medicinal plant I have chosen the Tea plant Camellia Sinensis.  It is an evergreen Asian shrub from a genus named after Jesuit botanist Camellius, many of its cousins are popular with gardeners for their colourful flowers and glossy foliage. As a beverage it has been used for 5000 years, possibly more. Said to be ‘discovered’ as a potion by Emperor Shen Nung in 2737 BCE it is not only part of many of our own daily rituals, but has played a part in ceremonies in Asia for as long. In China, offering a cup of teas shows respect to an elder, says sorry and gives thanks on a wedding day. From a health point of view, tea contains antioxidants, lowers cholesterol and raises High-density lipoprotein (that is the good cholesterol), and raises metabolism. Green tea can also reduce fatty deposits in the liver, can boost immune function, and kill bacteria living in the mouth.

While your imaginary cuppa cools down, here are a few factoids about tea:

* The country where most tea is drunk per person is Turkey.
* Expenditure on coffee in Britain first overtook the amount spent on tea in 1998.
* The United Kingdom drinks about 165 million cups of tea a day
* There is an estimated 1,500 different types of tea.
* Tea is the most widely consumed beverage in the world, after water.
* There are 6 basic categories of tea: 1) white, 2) yellow, 3) green, 4) oolong, 5) black, 6) post-fermented

**20th Century: Research and networks**

After the 1st World War, all the Garden’s men folk miraculously came back alive and well. The same cannot be said about poet Wilfred Owen who spent one of his last days in England at the Garden with his friends including Osbert Sitwell and Sasoon for an ‘ideal summer’s afternoon’ in the sun.

There was an increase in necessary research projects based at the Garden, largely under Curator Hales. These included plant physiology and pathology, and included research on cereal responses to day length and the effects of plant hormones amongst others.

During the 2nd World War, the garden was not forced to grow food crops, but instead provided anaesthetics to University College Hospital, including Digitalis (Foxglove) and Hyoscyamus (Henbane) plants.

The late 1970’s saw the Garden at another financial and inevitably morale low point, echoing the one 80 years earlier. There were great uncertainties about its future as the City Parochial Foundation dissociated any control and a new course of money was essential to support the upkeep of the plants, the people and the place. The Garden’s glasshouse heating bills alone are quite significant. There were failed attempts of support/partnering from Kew, RHS, Natural History Museum, National Trust, Royal College of Physicians and others, so some key trustees raised a significant endowment, registered the Garden as a charity, opened its doors for the first time to the general public in 1983 and started a Friends scheme, which now has over 6000 members.

An Education Officer, Ruth Taylor started connecting with local schools from the mid 1980’s and this is the foundation that I am still building upon. In 1996 our Education centre was opened with expanded education programmes and offerings via Dawn Sanders and me. At that time, we worked under **Sue Minter** Curator from 1991-2001.

Sue was the Garden’s first female Curator and really knows her plants.

After a career in publishing she retrained in horticulture and joined the Royal Botanic Gardens, Kew where she became Supervisor of the Palm House during its restoration in the 1980s and designed the replanting.

Sue’s passions whilst Curator included conservation of plants and plant knowledge and medicinal plants in their many guises. In 1993 she, alongside the Garden’s first female Head Gardener Fiona Crumley, created the Garden of World Medicine, which featured traditional medicinal plants used by people from India, New Zealand, Australia, South Africa, China, Mediterranean and Northern Europe.  This highlighted the fact that 80% of the world’s population depend on herbal medicine as their source of primary health care and half of the top twenty-five pharmaceuticals derive from natural products, many of them plants.

She wrote a couple of self-led trails to the Garden focussing on Genetically Modified crops and Endangered knowledge of indigenous peoples relating to plants. On these same lines a modest plant bed was made which featured medicinal plants that are either threatened or endangered in the wild, largely due to over and unsustainable-harvesting methods, often by people just trying to make ends meet. This linked to international treaties such as the Convention for Biological Diversity (CBD) and the Convention on International Trade in Endangered Species (CITES).

There was an emphasis on memberships, collaborations and involvement with like-minded organisations and networks such as Botanic Gardens Conservation International (BGCI), Botanic Gardens Education Network (BGEN), PlantNet (now Plant Network), The London Environmental Educators’ Forum (LEEF) and others.

After leaving the Garden, she joined the Eden Project where she was Horticultural Director from 2001-6. She was also a consultant on Singapore’s Gardens by the Bay project.

Her publications include ‘The Greatest Glasshouse' (on Kew's Palm House), ‘The Healing Garden' (which was recently revised and updated for Eden) and ‘The Apothecaries’ Garden', a history of Chelsea Physic Garden which was published for the Millennium.

Sue is a horticultural consultant specialising in economic botany. She has a particular interest in medicinal plant policy issues and in public engagement with science.

Continuing her medicinal mission, she is currently editing a guide to the top 300 over-the-counter herbs in the UK (most of which are imported) and the issues involved in their production and is the Chairperson of The Herb Society.

One of the plants that Sue featured in her *Garden of World Medicine* is this very useful species. Artemesia annua - Sweet Wormwood, Sweet Annie, Sweet Sagewort, Annual Mugwort, Qing Hao amongst other common names.

*Artemisia annua* is an herb in the daisy or Compositae family, traditionally (for over 2000 years) used in Chinese medicine to treat fever, inflammation, and malaria. It is a sibling of the plant that gives us absinthe and when one rubs the leaves and flowers of this plant you can tell it is a cousin of chamomile - a pleasant sweetness. It contains a compound called Artemisinin which has been shown to be effective in treating malaria in clinical trials as it can kill the deadly malarial parasite, (it is selectively toxic to the asexual erythrocytic stage of the parasites). Artemisinin, above other remedies has become extremely important in treating malaria, since resistance to many other anti-malarials has become widespread.

This is an excellent example of a plant-based medicine being tried and tested for millennia and then being cashed in on by modern pharmaceutical companies: a) because it works, b) it is highly profitable.

Now here is the nasty part. Reported in *The Lancet* and other journals, there is evidence of widespread forgeries of Artemisinin pills and packaging in South-East Asia (particularly Thailand and Cambodia) and Sub-Saharan Africa. From samples taken this was between 20% - 46% that failed the various tests for authenticity. The forgers are either diluting the pills, or not putting any of the active ingredient in at all to cut costs and make more money. Not only that, the visual authenticity of the packaging, including the highly detailed small hologram on the packets are enough to fool both the drug stores and customers. But not the mosquitoes or Plasmodium, but by then, it is too late. Malaria kills 1 child every minute.

**21st Century: Making it relevant to our lives**

Before leaving the Garden in 2001, Sue Minter and team created a Pharmaceutical Garden which displayed modern day pharmaceuticals in sections such as oncology, dermatology, psychiatry, analgesia/anaesthesia, cardiology, parasitology and more - this was to be revamped several years later by the next of my notable people.

We have continued to be active in various networks and organisations including the London Gardeners’ Network and LEEF, we strengthened links with BGEN and BGCI - attending and presenting at their national and international conferences and congresses. An important initiative that we signed up to is the Global Strategy for Plant Conservation (GSPC).

Around the beginning of this century, I became more and more fascinated by the different facets of ethnobotany and after seeing the reactions by urban children visiting the Garden to very ordinary things like onions growing in the ground, the idea of the *Shelf Life* project popped into my head and I began to grow and display plants growing in their corresponding product packaging, such as a potato plants in a crisp packet or an onion in a jar of pickled onions. In 2004 we put together of around 90 different plants in a mini supermarket style for the RHS Chelsea Flower Show, which earned us a Silver Gilt Medal. We carry on the display at the Garden to this day because it is still relevant and is still a need to teach and remind people of our reliance on the plant world in every aspect of our lives.

The Garden has a modest library which is not as accessible as it could be, but we are trying to address that by creating electronic versions of some of the books and maybe one day we will have a similarly sumptuous reading room as the one at the Welcome Trust.

We have an ever-expanding Learning programme - with short courses for adults on subjects such as botanical art, beekeeping, nature printing, leaf-inspired jewellery, perfumery, herbalism, composting, plant identification and botany. We have a series of supper talks and this year the main focus will be scent.

Our education team (currently 2 of us) go to schools, colleges, clubs, festivals and science fairs to bring a little of the Garden to others, rather like I have been doing for you today. Many visits take place to the Garden for schools and family groups, on a range of subjects, and the visit quite often represents the first guided close up experience of the natural world to an urban audience. I consider it to be not only a living museum.

Without a sterling team of volunteers the Garden would grind to a halt.

Open to the public throughout the year, with a lovely cafe, expert tours and decent signage for self-exploration, the Garden is often hired as a venue for parties, weddings, cafe, conferences etc. This is one of the ways we are able to survive financially and carry on the charitable work and fulfil our commitment to Sir Hans Sloane. Whilst on the subject of upright, honourable gentlemen, my last human landmark of this talk is **Nick Bailey Head Gardener from 2010 - present.**

Nick is a degree-qualified horticulturalist and garden designer with over 20 years’ experience in the field. He has designed and managed gardens in the UK, South Africa and Australia. He began by working for a Norfolk nursery on tree, shrub and rose production. During this time he studied at Cambridge College and gained a place on the NDH course at Hadlow College, Kent. Studies continued as Nick began his degree at Greenwich University.

Nick had written a number of magazine articles by this point so when the opportunity to work as a technical editor for *Garden Answers Magazine* arrived he grasped it with both hands. Nick returned to hands-on gardening when he moved back to his native Norfolk to take on the head gardener role at The Wicken - a private estate. Over four years Nick redesigned the four Victorian walled gardens on the estate while establishing himself as a freelance garden lecturer and writer. His writing regularly appears in RHS *The Garden*, BBC *Gardeners World* and *The Mail on Sunday*. He was also a weekly panellist on BBC Radio Norfolk’s gardening programme – the most listened to show on the station!

Nick took on the role of Head Gardener at Chelsea Physic Garden 6 years ago and has launched the process of resigning the garden to make it more accessible for a contemporary audience. Three temporary gardens designed by Nick; a Jamaican Provision Ground, Garlic Garden, and Indian Spice Garden have widened engagement with the Garden which he hopes will continue with the creation of the new Edible and Useful Gardens on the CPG site. He went on to create an entirely new layout for the Medicinal quadrant of the Physic Garden as well as a World Woodland Garden and a new look Summary bed. His first book ‘365 Days of Colour’ was published in 2015 and he also wrote the CPG guide book.

He naturally has horticultural, visual and design brilliance - with an emphasis on increasing the percentage of medicinal and otherwise useful plants into the CPG collection and at the same time increasing the intellectual and physical accessibility of the Garden overall.

For the final plant landmark I have chosen a plant that links to Mr. Bailey rather nicely, both symbolically but also as it is edible, useful and medicinal which are areas of the Garden Nick has really made a difference to in a short time, the plant is **Bamboo.**

These are plants (approximately 1400 species) in the Bambusoideae sub-family of flowering perennial evergreen plants in the grass family Poaceae. Not surprisingly, with this large number of species there is a huge amount of diversity in terms of form, shape, size and uses. Some can grow as much as 30 metres in height and even grow one meter per day.

Ethnobotanically bamboos have been used to make: buildings, beer, bicycles, baskets, fishing nets, cloths, socks, hats, tools, scaffolding, pens, flutes, pipes, gutters, food, medicine, ink, acupuncture needles, paper, mats, chopsticks, cups, ladles, plant supports, posts, arrows, styli, coffins, chairs, toys, yurts, beehives, umbrellas, aphrodisiacs, inspiration for art, reinforcement for concrete, and some of the prototype incandescent light bulbs used in bamboo stems as the glowing filaments.

Deeply rooted in the psyche and culture of China (as is its cousin, rice), bamboo was allegorical to how a gentleman should behave. Bai Juyi (a renowned Chinese poet and Tang dynasty government official, 772-846), suggested that one should always be as upright as the bamboo and equally as strong. Also, just as the bamboo culm (stem) was hollow, so should the perfect gentleman keep his mind open and never entertain prejudice or secret thoughts.

Many species of bamboo are monocarpic, which means once they flower they set seed and then die. This could be after 10 or 20 years or as many as 120 years, depending on the species (with all individuals of each species being globally synchronised). Obviously some of these seeds will find a place to safely germinate, but many will not.

Once the plant dies, entire swaths of bamboo forests are wiped out over a several year period. One theory is that seed production requires an enormous amount of energy which stresses the bamboo plant to such an extent that they actually die. Another theory suggests that the ‘mother’ plant dies to make room for the bamboo seedlings.

The mass flowering events also attract predators, mainly rodents. The sudden availability of fruits in huge quantities in the forest brings in tens of millions of hungry rats who feed, grow and multiply at alarming rates. After they devour the bamboo fruit, the rats start consuming crops - both stored, as well as on fields. A bamboo flowering event is almost always followed by famine and disease in nearby villages. In the northeastern India's state of Mizoram, the dreaded event occurs almost like clockwork every 48 to 50 years, when the bamboo species *Melocanna baccifera* flowers and fruits. The phenomenon, which occurred last in 2006 to 2008, is known in the local language as mautam or "bamboo death".

**The future...**

I can be sure that in 2022 we will be celebrating the 300th anniversary of Sloane signing the important contract that secured our present existence. I can also reveal that we will be celebrating the Garden’s 350th birthday on 2023 with all manner of fanfare and ceremony - watch this space, as they say.

What I cannot be sure of, is what the 22nd and 23rd Century Chelsea Physic Garden will look like and which plants will be growing there (perhaps the Thames will rise and engulf it), but one thing I can be absolutely sure about is that the Garden’s visitors (and non-visitors alike) will be relying on plants for every aspect of their futuristic lives.

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