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## FROM THE GARDEN OF SIMPLES TO THE BOTANICAL GARDEN OF PISA UNIVERSITY. HISTORY, ROLES AND PERSPECTIVES

**Abstract** - The history, the past and present roles and some current perspectives of the Botanic Garden of Pisa University are summarized, together with the main important activities carried out by the directors during more than four centuries of this academic institution.

**Key words** - Garden of Simples, Botanic Garden, Pisa.

**Riassunto** - Dal Giardino dei Semplici all'Orto botanico dell'Università di Pisa. Storia, ruoli e prospettive. Viene sinteticamente illustrata la storia dell'Orto botanico di Pisa, dalle origini quale giardino dei semplici nel XVI secolo fino alle attuali funzioni, tra le quali acquista particolare rilievo la conservazione delle piante minacciate di estinzione. È anche presentato il ruolo dei principali *praefecti* che si sono susseguiti alla direzione del giardino, le piante più significative delle collezioni e le architetture che nel tempo sono state realizzate per ospitarle.

**Parole chiave** - Giardino dei Semplici, Orto botanico, Pisa.

In a letter dated 4th July 1545, the great naturalist, herbalist and physician Luca Ghini (1490-1556) states he had gathered plants «which I have planted in a garden of Pisa to be useful for the students». This document demonstrates that Ghini – called by Grand Duke Cosimo I of the Medici family in 1543 from Bologna to Pisa – had a piece of land at his disposal specifically for teaching botany. Other official references regarding the founding of the Pisa Botanical Garden were never identified, but from an historic point of view Ghini's paper testifies that the first academic botanic garden in the world was established in the Tuscan city of the Leaning Tower, close to the Arno River (Chiarugi, 1953). Unfortunately this garden, called *of simples* due to the cultivation of many medicinal plants (= *simples*) was soon replaced by a second garden in the eastern part of Pisa, which was entrusted to Andrea Cesalpino (1525-1603), the most brilliant of Ghini's pupils (Fisher, 1998). However the site of this new garden was unsuitable so that the Grand Duke Ferdinand I ordered the Garden to be moved again. The third and definitive Botanical Garden was created during the years 1591-1596, two hundred metres from the Baptistery, the Cathedral and the Tower, standing in the so-called «Square of the Miracles». The construction was initially entrusted to Lorenzo Mazzanga, probably a student of Cesalpino's, and then to the Flemish gardener Jodocus De Goethuysen or Giuseppe Casabona (c.1515-1595), who served the Medici family in Florence (Goethuys 1995).

Even if a documented architectural scheme of the first two Pisan Botanical Gardens is still unknown, both of them were clearly based on the feature of the claustral gardens of the time, possibly with a classic cross disposition of the beds with a fountain in the centre. A map of seventeenth century shows simultaneously all three gardens with a very geometric and regular layout, but probably it is a question of a symbolic representation. On the contrary very well known and detailed is the layout of the third garden, typically following the rules of the so-called Italian Renaissance Garden. Its map clearly appears in a very accurate copper-plate engraving published in 1723 by Michelangelo Tilli (1655-1740) in his *Catalogus Plantarum Horti Pisani* (Fig. 1). Eight large slightly rhomboid beds, each of them regularly divided into small areas such as square, rectangular, triangular or circular or oddly symmetric small beds, are present. Clearly the structure recalls astrological and/or religious meanings, linked with the monastic *horti conclusi* of the Middle Ages. Each bed is provided with a circular or octagonal fountain in the centre, six of them are still present, obviously useful for watering but also for the aesthetics of the garden. In Tilli's *Catalogus* more than four thousands plants cultivated in the garden are listed, fifty of them gracefully illustrated by a famous artist of the time, Cosimo Mogalli. It is obvious that the Pisan garden originally had not only a didactic role but also was meant to be a pleasure place where the members of the Medici family with their guests had the opportunity to discuss both scientific, artistic and literary subjects and exchange opinions and meditations. Enclosed in the garden was a *Gallery*, a showcase with thousands of extremely various articles (*naturalia, artificialia, curiosa*): the visitors, many of them coming from foreign countries, could admire corals, minerals, whale bones, a dried crocodile specimen, a mummy, a variety of shells, fossil plants and animals etc. as an inventory compiled in 1626 by the *praefectus* Matteo Pandolfini shows. This type of collection, an embryonic stage of a true natural history museum, was considered throughout the XVIII and XIX centuries as showing the high reputation of Pisa University (Garbari *et al.*, 2002). The building which hosted the Gallery still presents a very fine decoration in a *grotesque* style on its front face, completely restored in May 2005 (Garbari *et al.*, 2005). It is worth mentioning that at the end of XVI century and during the following times noteworthy importance was given to the drawing and representation of plants

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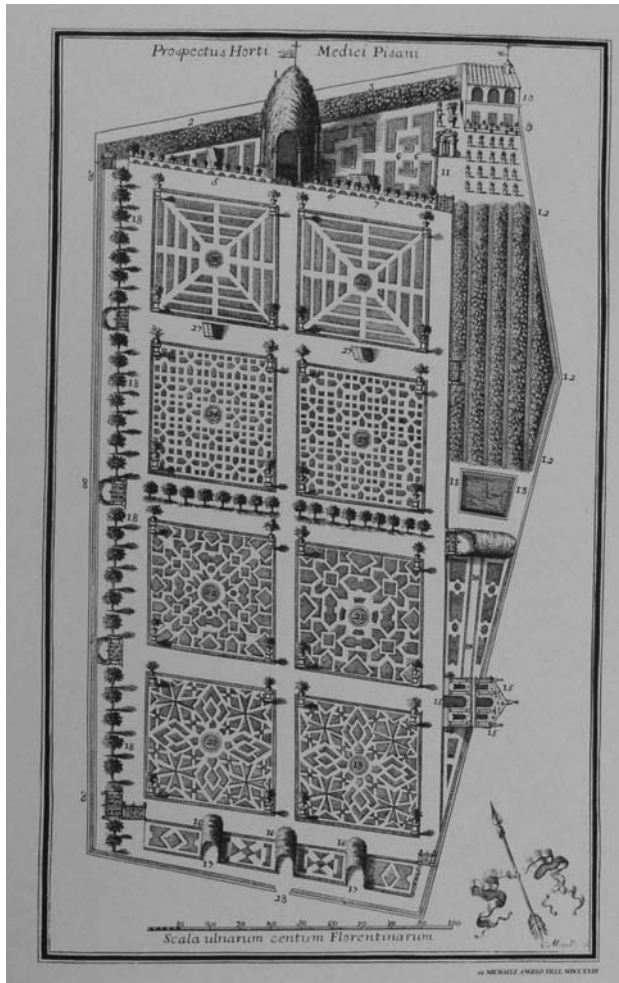


Fig. 1 - The layout of the *Garden of Simples* in Tilli's (1723) *Catalogus Plantarum Horti Pisani*.

and animals. Many illustrious artists both Italian and foreign were entrusted to illustrate the living specimens of the Botanic Garden; the collection of such watercolours important from artistic and scientific points of view is preserved in the Central Library of Pisa University. In the Botanical Museum sixteen portraits of *praefecti* (i.e. directors) or of the most prominent naturalists and botanists linked to the Garden are still present. Some of them, such as Carolus Clusius, director of the Botanic Garden of Leiden, or Pier Andrea Mattioli of Siena, were used to exchange seeds or living and dried plants with Giuseppe Casabona or Luca Ghini, respectively. At that time, some plants such as *Styrax officinalis*, *Phoenix dactylifera*, *Aesculus hippocastanum*, *Bombax septenatum* were growing in the Garden. Also the potato reached Tuscany: cultivated in the Pisan Garden it was stewed and offered to the Grand Duke: «it turned out very well» (Garbari *et al.*, 2002). In the transitional period between Neoclassicism and the Romantic Movement, the original layout of the Garden

remained the same up to the end of XVIII century, when in 1782 the new director Giorgio Santi (1746-1822) decided to give it a new modern look. Thanks to his enthusiasm and care the Garden improved the number of cultivated species, some of them are still alive such as a male specimen of *Ginkgo biloba* and a *Magnolia grandiflora*, both planted in 1787. Not only this but Giorgio Santi greatly modified also the layout of the old *garden of simples*. The beds of the western side of the Renaissance garden were changed into a series of rectangular, symmetric areas of the same size (the so-called *Botanic school*) with herbaceous plants located according to Linnaeus' (1707-1778) new classification system. In the western part of the garden, called *Arboretum*, trees and shrubs were planted without special attention to the position or geometry of the beds.

This new garden structure was further completed by Gaetano Savi (1769-1844) and his followers. This scientist wrote many basic scientific volumes devoted to teaching; promoted the publication of his *Flora Italiana ossia raccolta delle piante più belle che si coltivano nei giardini d'Italia* (The collection of the best plants cultivated in Italian Gardens), with extremely beautiful figures; in 1805 he printed a book on medicinal plants (*Materia Medica Vegetabile Toscana*) and in 1811 a treatise on Tuscan trees (*Trattato degli alberi della Toscana*). Savi built new glasshouses and a special conservatory for aquatic plants, increased the Garden Library and the Herbarium collections and chaired the session dedicated to Botany and Plant Physiology during the first Meeting of the Italian Scientists in 1839, held in the Botanic Garden; a special event with some political significance in view of the unification of Italy (Garbari *et al.*, 2002).

Another very influential person on the history of the Pisan Botanic Garden was Teodoro Caruel (1830-1898). After long journeys through Europe, in 1872 he published an interesting *Nota di viaggio sopra alcuni giardini e musei botanici* (Travel note on some Botanic Gardens and Museums) and after a while, a booklet aimed mainly at his scholars with the list of the plants cultivated in the *Botanic school* of the Garden, together with their uses, provenance and properties. He described in a very detailed way the layout and partition of all the Garden sectors: the hill, the conservatory, the seedling nursery, the so-called Orto del Cedro (the Cedar Garden, where under the canopy of a *Cedrus libani* planted in 1787 the meeting of the Italian scientist took place in 1839), the fern collection, the glasshouses, the Horticultural Laboratory and the adjacent Museum. An enclosed map shows the so-called *Botanic School* completed with 124 central rectangular beds in 4 rows and 24 new peripheral beds on the side. In 1877 an updated plan of the Garden was made; it can be seen at the entrance of the Botanic Institute, the present address of the Department of Biology (Garbari & Bedini, 2002). The neoclassic building of the Botanic Institute is due to Giovanni Arcangeli (1840-1921), Caruel's successor. This resolute and prestigious naturalist succeeded in acquiring all the space delimited by four streets of the town so that the area of the Botanic Garden cannot be reduced or altered. Arcangeli was a versatile scientist: as a skilled

systematic botanist and very experienced in agricultural techniques he studied a large amount of plant biology aspects also devoted to practical applications. Also in the present days he is well known as a plant taxonomist because in his *Compendio della Flora italiana* printed in 1892 a modern concept of *subspecies* is applied. Since the start of XX century the layout of the Garden with Arcangeli's new building at the centre has not changed consistently. The Garden is divided in the two main parts called *School* on the southern side and *Arboretum* on the northern one. It stands on about three hectares, including 880 sq.m. of glasshouses and service areas. In the last two years, because of the need to optimize the cleaning system of the beds particularly as regards grass cutting by lawnmowers, many of the rectangular areas of the *School* have been subdivided into small internal squares lined with cement, each of them with a single herbaceous species, mainly from the Mediterranean area. Before adopting this solution, careful consideration was given so as to avoid ruining the aesthetic appearance. To weed the Garden paths all herbicides have been abolished, in favour of the fire weed control, a technique based on the rapid exposure of weeds to the heat of a flame generated by a specific burner which devitalizes the plants or slows their growth, avoiding pollution and toxic residues.

Some roles of the ancient *garden of simples* have changed over the centuries. As in the past it supports all teaching activities. In every season the students of Biology, Natural Sciences, Environmental Sciences, Agriculture, Veterinary and Pharmacy regularly visit the Garden with their teachers. Living material for the courses, for practice, for laboratory and experimental needs is provided. Apart from the traditional didactic and scientific roles, a new one, as in many other Botanical Gardens of the world, has been present for some years: the conservation of plants threatened with extinction. For this commitment a seed bank with material preserved at 20 degrees below zero and under controlled humidity has been provided. The seeds of critically endangered or vulnerable species of the national or regional Red Lists were gathered mainly in the protected areas of Tuscany, i.e. the National Park of the Tuscan Archipelago, the Regional Park of Apuan Alps, the San Rossore Estate or their surroundings. In this context the seed biology and physiology of the rarest floristic units are studied by the scientific staff of the Biology Department, in order to understand the most appropriate strategy for *ex situ* conservation.

The Pisa Botanic Garden hosts the presidency of RIBES (acronym of *Rete Italiana Banca Ex Situ*), a national network of about twenty research units dealing with the conservation of Italian flora, and is a member of ENSCONET (*European Native Seed Conservation Network*). The aim of these organisations is to improve quality, co-ordination and integration of European seed conservation practice, policy and research for native plant species and to assist the European Community conservation policy and its obligations to the Rio de Janeiro Convention on Biological Diversity.

There are 12 staff members: the Director, the Curator and 10 gardeners.

After three years during which the Garden was closed to visitors for restoration, at present it runs its full activities. Since 5th May, 2005 it is freely open every morning, 8.30-13.00, excluding Sundays and other festivities. Also the Museum, i.e. the ancient Gallery, can be visited with a guide upon request. Apart from the aforementioned portraits, fine wax models of more than one hundred fungi all coloured with natural dyes are on display, together with plants showing their reproductive system. Among them, the most important and famed is the model of the fertilisation of zucchini (*Cucurbita pepo*) introduced to the Grand Duke of Tuscany Leopold of Lorraine on the occasion of the first Meeting of Italian Scientists in 1839. A true heirloom is the ancient walnut main door at the entrance to the Garden, dated about 1596, with four plants carved in bas-relief, typical of Renaissance botany: *Fritillaria imperialis*, assumed as the symbol of the Garden, *Agave americana* (a plant from the New World), *Atropa belladonna* (a simple famous for its medicinal active extracts) and *Verbascum thapsus* (frequently used in domestic medicine as an emollient and a good tisane or cough remedy). Lastly we cannot forget a sort of writing desk – called *studiolo del Granduca*, dated to the end of XVI century – with two rows of drawers to stock the seeds collected in the Garden and offered in exchange to other gardens in Europe or Italy by the Pisan botanists. At the centre of this piece of furniture a kind of tabernacle with the six balls – the coat-of-arms of the Medici family – in which the rarest books were locked. The *studiolo* can be considered the first seed bank in history, an omen for the conservation of plants at present threatened with extinction.

In 1991 the fourth centenary of the Pisa Botanic Garden was celebrated by an international meeting (Bedini & Garbari, 1991). An intriguing question was discussed, whether the past might not provide the key to face the challenges of the future. The answer was unanimous.

#### REFERENCES

- Bedini G., Garbari F. (eds.), 1991. I 400 anni dell'Orto Botanico di Pisa. Atti Convegno Internazionale, 11-13 ottobre 1991. Pisa.
- Chiarugi A., 1953. Le date di fondazione dei primi orti botanici del mondo: Pisa (estate 1543); Padova (7 luglio 1545); Firenze (1 dicembre 1545). *Nuovo Giornale Botanico Italiano* 60:783-839.
- Fisher P.D., 1998. I giardini di età medicea e lorenese. In: Giusti A. (ed.), *Giardini di Pisa. Storia, conservazione, progetto*: 49-90. Edifir, Firenze.
- Garbari F., Bedini G., 2002. Architetture, spazi, tempi e piante nell'Orto Botanico di Pisa: un'evoluzione simpatica. In: Piva A., Galliani P. (eds.), *Nuovi paesaggi. Storia e rinnovamento del giardino botanico in Italia*: 115-124. Marsilio, Venezia.
- Garbari F., Tongiorgi Tomasi L., Tosi A., 2002. *Giardino dei Semplici - Garden of Simples*. Ed. PLUS, Pisa, 275 pp. (with English version).
- Garbari F., Tongiorgi Tomasi L., Tosi A., 2005. *L'Orto Botanico di Pisa*. Ed. ETS, Pisa, 64 pp.
- Goethuys B., 1995. Giuseppe Casabona alias Jodocus De Goethuysen ca. 1515-1595. Een Vlaams plantkundige in Italie. Ed. Priv. Bertha Goethuys, Belgium, pp. 323.

