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Beyond White Architecture: Therapeutic gardens for patients with tuberculosis in the sanatoria of the Greater Lisbon area (1870-1970)

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DOI 10.2478/glp-2019-0004

Gardens and Landscapes, De Gruyter Open, nr 5 (2018), pp. 39-55. URL: <https://content.sciendo.com/view/journals/glp/glp-overview.xml>

ABSTRACT

This article discusses the concept of therapeutic garden— its definition and importance, — in the context of the specific architecture of sanatoria for the treatment of tuberculosis, in particular the case of Lisbon’s sanatoria from 1870 to 1970.

It contemplates both national and international networks of circulation and transfer of knowledge before and after the medical and architectural revolutions at the turn of the twentieth century. These revolutions were accompanied by significant changes in the city’s structure concerning the control of epidemics and social diseases. Architects and physicians, among other experts, are the main characters to be scrutinized, alongside with their architectural and scientific production and their entanglements. At the same time, I seriously take into consideration their interactions with the spheres of power, specifically in what relates to management and decision making.

Keywords: Therapeutic garden, sanatoria, architecture, medicine, landscape architecture

ARTICLE

Introduction

The garden, often mistakenly consigned to the literature as a *green space*, has long been one of the distinguishing elements of hospital architecture (GERLACH-SPRIGGS et. al. 2004¹).

As far as their typology is concerned, gardens and landscapes can be specialized and adapted according to their purpose. Their typology is transversally marked in various special configurations, among which gardens for hospi-

¹ Within the text, the source of the reference is used in the last quotation to prevent multiple citations and, consequently, disrupt the reading. When the reference is related to the entire book (*passim*), the page number is not mentioned. There are also a large number of references, justified by the extensive archive sources.

tals or for dwellings, but they are mostly forgotten in specific architectural systems.

Within this context, this paper aims at assessing the significance and major importance of the garden in architecture addressing the fight against the *white plague*, as well as its role in architectural and scientific biases. Therefore, the sanatorium architecture and system set the stage and are used to suggest and attest the garden's significance, especially due to its specific role in medicine and on the healing for tuberculosis.

Sanatorium projects have always been based on medical commitments, that is, their functional strategies and necessary services have been defined by doctors, in compliance with international movements. The very first draft design is correlated with the medical functional program, to assure the acceptance of sanatoria as techno-scientific places.

The garden plays a preponderant role in the relationship of strong and unbreakable bonds between the medical program and architecture, in both the prophylactic effect and medical prescription. The garden was a paramount element in the treatment and fight against tuberculosis within the sanatorium, as well as in the general tuberculosis control program.

From the 1850s onwards, references to this have been found both in Portugal and Europe, with also known connections to North America. During the second half of the 19th century, there was then enough time and space (due to the urgency of finding new ways to fight tuberculosis) to create scientific channels of knowledge through books, papers and even correspondence between doctors. This exchange of knowledge, together with its circulation, promoted the construction of a *patchwork* of knowledge to help understand both medical and architectural systems that defined the concept of sanatorium. Its formal configuration, designed to allow for treatment, is not only based on the garden but also on an intersecting series of premises. To understand these special premises and their evolution over time, it is necessary to contextualize the situation before and after the very important scientific transition that took place from the nineteenth century to the twentieth century.

At an international level, physician E.V. Trudeau advocated a model of sanatorium materialized in the Adirondack Cottage Sanatorium (Saranac Lake, New York, c. 1884). It was organized in multi-pavilions to avoid contagion between them, while it enhanced the relevance of the concept of "*return to nature*".

Other sanatoria, such as the Sanatorium of Archachon (Gironde, France, c. 1888), also adopted this configuration: completely independent pavilions assured air circulation and, consequently, prevented infection. This model was widely disseminated between the last decade of the nineteenth century and the first decade of the following century, in particular due to studies by physicians Thomas Carrington (CARRINGTON 1911, 1910, 1912) and Adolphus Knopf (KNOPF 1895, 1899, 1907). Another example was the Falkenstein Sanatorium (Taunus Mountains, near Frankfurt, c. 1886), known as the "mecca of physiotherapists". It was surrounded by a forest and extensive gardens, including several paths for circulation and excursions into the forest (KNOPF 1899: 90-94). Carrington and Knopf's books were widely circulated and studied in Portugal, and even referred to in architectural projects, alongside with medical treatment know how (WALKER 1899; ENGELMANN 1901). The acceptance of the principles of treatment by exposure to nature and its elements, namely the air and the sun, led to the adoption and adjustment of these principles by open-air schools, which favored the natural environment and landscape setting (SANTOS 1904: 35-37; *A tuberculose e a Escola* 1907: 62-63).

The first experiments with sanatorium architecture in Portugal: the garden principles as the rule. Transfer and circulation of knowledge in the late nineteenth century

The above-mentioned considerations are crucial to understand the Portuguese position in respect to sanatoria for tuberculosis and their association with the garden. Considering the first incursions of sanatorium architecture in Portugal, more precisely in Madeira and Serra da Estrela, it is possible to identify the importance of the garden, even before considering sanatoria in their function as medical instruments or medical-architectural devices. Evidence of this can be found prior to the modern scientific revolution between the nineteenth and twentieth century, alongside crucial medical developments such as the discovery of the tuberculosis bacillus (Koch) and the microscopic *vision*, developments in microbiology, X-rays and auscultation (PORTER 2011: 136-175). In addition to the stipulation of the transmission mechanism of the disease (and consequently the most effective ways of fighting it), these breakthroughs allowed doctors to *see* and *hear* the body through reliable techniques. Therefore, diagnostic tools were crucial to identify the bacillus and manage the very first phases of the disease. These new perspectives in science would also bring a new approach to the tuberculosis control and treatment program and, consequently, to architectural revolutions. The garden was either kept unharmed through these moments of transition or it assumed an even more important role: allowing the circulation and purification of air, as a parallel process to the one of *sanitization* of an unhealthy tuberculosis soul.

In Portugal, the first experiments with the treatment of tuberculosis were based on these principles and took place in the form of a scientific pioneering sanatorium in Funchal, Madeira – the also called “ocean flower” (HUGHES 1845: 64), taking advantage of the existing gardens (VIEIRA 2011: 85-103; MATOS 2013; AVELÃS NUNES 2011: 910-927). With a romantic, leafy and differentiated character from the usual continental gardens, it quickly gained *charisma* in therapeutic and touristic management, and was therefore cited and broadcasted at an international level (MASON 1850: 315-376; DIX 1851; WHITE 1851; LUND 1853; EMBLETON 1882; TAYLOR 1882; KÄMPFER 1847).

Ellen Taylor dedicates a chapter exclusively to the detailed description of the flora of Funchal in 1882, subdividing it into native vegetation and cultivated fruit trees, among others, but with particular attention to flowers.



Figure 1. Quinta Pavão, Madeira's sanatoria (postcard). c. 1890. Source: delcampe.net

Taylor even transcribes the local birds for the understanding of Funchal's natural ecosystem. At the same time, Taylor also mentions Hospício da Princesa Dona Maria Amélia² (Funchal, Madeira, 1856), which had already been installed on the island and was fully functioning for the poor consumptives. In Taylor's words, the patients seemed clean and comfortable but most of them also looked very ill, even though they were properly treated. The exhaus-

2 Despite its name of “Hospício”, it was a sanatorium.

tive description of the hospice garden is notable: “the beautiful garden is full of rare and interesting trees and shrubs, some indigenous and others brought from afar”. Palm trees, which will be mandatory plants in other spaces, are referred to their smallest detail:

“(…) many varieties of palm flourish, especially the Fan and Sago Palms, various Acacias, curious Euphorbias, Coral trees, Jacaranda Mimosifolia, Bamboos, Strelitzias, Oleanders-pink, flesh-color, maize, and white-many varieties of Abutilon, Bougainvilleas, Allamandas, Hibiscus, Heliotrope, Wistaria, hedges of Lantanas, Sweet Scented Olive and Stephanotis (...) Mingling with these are roses, geraniums, lilies, verbenas, and many lovely flowers” (TAYLOR 1882: 53).

At the back of the sanatorium, there were at the time vineyards and vegetable gardens. Sanatoria used to produce their own food supplies, both for their sustainability and healing recreation of its patients.

At the end of the 19th century, the Hohenlohe concession in the island of Madeira was established for the construction of sanatoria by German investors. Reports from renowned international tuberculosis physicians, such as Pannwitz or Frankel, indicated at the time that pine forests “intended for parks and walks” would “be suitable for tuberculosis”, especially when “nature has endowed the island of Madeira so well with sanatoriums” (FRANKEL et. al., 1903: 194). The concession allowed the formal constitution of a company for the treatment of tuberculosis and the conversion of Funchal into a first order cosmopolitan medical station.

In the case of Serra da Estrela, Sousa Martins’ scientific expedition of 1881 methodically analyzed parameters of the mountain’s environment, flora and fauna, with a special emphasis on the fresh air and altitude. These last two indicators were established in the late nineteenth century as crucial for the treatment of



Figure 2. [sanatorium] Princess Amelia Hospice, Funchal, Madeira. c. 1900. Private collection



Figure 3. Quinta das Angústias; Kurhotel Amélia, Madeira’s sanatoria. c. 1900. Perestrellos Photographos (Matos 2013)

both pulmonary consumption and tuberculosis and, consequently, essential when positioning and building sanatoria. This expedition and the consolidation of Serra da Estrela as a cure station for tuberculosis was based on proven cases of the success treatment to a kore or less extent, which gave rise to the construction of some sanatoria. The physician Sousa Martins was the main supporter of exploring this location for medical reasons.

The transfer of knowledge, both at the level of location and climate specifications

and the treatment itself, was valued by Portuguese doctors when compared with other resorts such as Davos, Switzerland, (GUIMARÃES 1897; PÁDUA 1898). The constitution and exploration of Davos as a sanatorium city was familiar to Portuguese experts, and thus its characteristics became widespread when describing its modern constructions of wide streets and trimmed gardens, and its own special gardens (*Kurverein*), which opened to the “promenade”, where daily orchestra concerts were offered (Ilustração Portuguesa 1911, 65-69). The analysis of these special climatic regions also had an impact on metropolitan cities: Lisbon changed its urban composition and layout at the beginning of the 20th-century, based as well on the high spread rate of tuberculosis. An Ouroboros serpent was created when the circulation of knowledge between Europe and America bit its own tail.

The modern(ist) sanatorium: the garden program as medical prescription.

From the very beginning of the twentieth century onwards, there has been a paradigmatic change in the conception of sanatoria, established according to a medical-architectural program and experiments conducted by scientific investigators. These modern institutions are now proven and accepted, constituting the second version of sanatoria for tuberculosis. Despite these changes, the garden has not been sent into the background, as it has remained an element of primordial importance, notwithstanding its stylistic or scholastic conception.

The *modern criteria* that required a building with great sun exposure, free from humidity, fog and winds and with a low human density has been not only applied to sanatoria but it has also become imperative in other types of architecture (MONTERROSO 1902: 54). Several contacts were established with the government, particularly with regard to low cost housing and the inclusion of specific hygienic rules (ARAÚJO 1994: 58).

In parallel with the acceptance of the sanatorium as a model, hygienic issues also extended at the time to debates on housing typology (CASTRO 1909: 107-108). The dwelling of consumptives was often the same as the worker's, linked to aspects that led the subject to pillars of social moralism, masked by police hygiene. So, the standard house should have a “small garden” and be surrounded by a green area, preferably with gardenized yards (WACHSMANN 1948: 108). The presence of the garden was not only therapeutic, but it also worked as a purifying element and as a sign of safety and health, replicating the sanatorium model. The safe architectural proposition from the sanatoria is also taken into consideration on the city and housing scale, due to its expected safeness.

The countryside *versus* city model was also being discussed worldwide, due to the reported low prevalence of tuberculosis cases in non-urban territories. After improving their health, patients suffering from tuberculosis should be sent to convalesce into chosen families in the countryside, due to the recognition of the importance of fresh air and green elements as a way of continuing treatment, away from the contaminated air of factories and



Figures 4 and 5. Rest cure in woods: air cure in the Sanatorium of Arcachon. c. 1890-1900. (Knopf, 1889); Air Cure in Portugal. c. 1900. Private collection

cities (CASTRO 1909: 133-135). In that way, patients were not cured due to the recognizable effectiveness of the treatment for tuberculosis in terms of mortality and morbidity.

Returning to the subject of the sanatorium, the definition of a modern design sanatorium (AVELÃS NUNES, 2017) requires the mandatory presence of a medical building, a gallery for healing or a solarium, and a therapeutic garden. These three elements of the system assume a differentiating character, as well as diverse scales, according to medical developments, architectonical languages and engineering breakthroughs.

It is undeniable that the establishment of the sanatorium obeyed well-defined criteria in respect to the selection of the territory and its zoning, as well as its configuration and the scientific analysis of its soils. Still, these specific geographical conditions did not only obey sanitary demands; they also followed a sustained and well-defined relation between the building and the surrounding green space – that is, the garden. The Sanatório dos Ferroviários (Arch. Cottinelli Telmo; Covilhã, Portugal, 1930s), for example, presents a concave shape to accentuate the depth of the scale and the tops of the building, but, above all, to frame the landscape (MARTINS 1995: 123). It was surrounded by a pine forest, “conveniently sheltered on a hillside” (MACEDO 1929: 5-6). Mandatorily, the connection of the galleries and the garden were consistent with the regulation and prescription ideas to fight tuberculosis inside a sanatorium.

The importance of landscaping was so important and demanding that gardens were consistently designed and built before the sanatoria structure. Following this principle, both the garden’s architectural implantation and its functional delimitation played a fundamental role in the treatment of tuberculosis.



Figures 6 and 7. Sousa Martins Sanatorium, Guarda: implantation with garden and trees. c. 1907; Railway Sanatorium, Covilhã: curved design for garden best views. c. 1930s. Private collection.

These concepts and their evolution can be better understood by resorting to some examples of sanatoria’s gardens. In the Sanatório Popular de Lisboa (Lisbon, c. 1910s), during the early years of the 20th century, the land area was immediately converted into a garden, immediately after its acquisition. There were planted mulberry trees and other trees from state nurseries (Sanatório ... Lisboa 1903: 39-46; Relatório ... Central 1908: 26). These prototypes came in line with international models, such as the already mentioned Arcachon Sanatorium, which had a large central garden space, and whose implantation project corroborated the area to be forested (CREMNITZER 2005), without assuming any profound modifications.

Already in the 20th century, the Sanatório Dr. José de Almeida (Paredes, 1905) had all the land “filled with seeds around the sanatorium and the garden itself, without disregarding the flowers”, right before admitting its first patients. It was intended to give patients the impression of a “quite comfortable rest home” (Soares 1943: 10-11). In this case, it is clear that the garden was not only therapeutic, but it also operated as mirror of hospitality, or even of a feeling of home. Physicians lived inside many sanatoria, in buildings imbedded within its gardens, thus ensuring



Figures 8. Sousa Martins Sanatorium, Guarda: main avenue (for rich patients only). c. 1907 (casaliris.blogspot.com)

their trust in prophylaxis and the absence of contagion, as evidence of safety.

In the Sanatório Sousa Martins (Arch. Raul Lino, 1907, Guarda), even before the architectural project and under the supervision of A.N.T. (The National Assistance Office for Tuberculosis in Portugal), the recommendations were for the planting of trees for wind protection, such as chestnut trees; there was a special interest for the outer green fence of the sanatorium as well (*Relatório... Guarda*, 1903a: 139-140). Reports from Lopo de Carvalho (President of A.N.T.) from 1906 indicate that a selection of resinous plants was also important. (*A luta...*

Martins 1906: 6-17). However, the green fence served as a curtain to protect both the sanatorium from the town's pollution, and also to sustain the concept of a closed and admission-controlled system.

Green fences are the last layer of the sanatorium system, but they are very important for its typological definition. Fences are the last barrier separating the sanatoria from its surrounding location.

The use of green elements such as tall trees were specific measures not only to promote patient's care (particularly in closed sanatoria with restrictions and controls of visitors and in and outpatients), but also to control external views. The sanatorium simulated a countryside ecosphere, but it also incorporated a mirror of the city: its architecture replicated an urban environment with streets and buildings, green spaces and leisure areas. The question of the *panopticon* of Jeremy Bentham – to see but not to be seen – had to be considered both inside and outside the sanatorium. Also, leaving the sanatorium was only possible, in a broad sense, either cured or dead.

The limit/fence importance persisted until the end of the sanatoria era, as exemplified in the project of the Grande Sanatório de Lisboa (Arch. Vasco Regaleira; 1930s-1940s, Lisbon). In this case, the inclusion of a fence was considered in the project to “ensure a permanent tree-lined isolation to reinforce the shelter of the centers and provide a calm and restful landscape for the galleries of healing” (REGALEIRA 1940). Due to the Second World War, but also to news concerning the discovery of medicines for tuberculosis, the sanatorium was not built in the capital city.

There is another point of view when assessing this same confinement of the garden. As mentioned, doctors and patients were living inside the sanatorium area, so ill and healthy persons were sharing the same site: despite the image of safety, the risk of infection had to be considered in these cases. However, there is no information or any recorded case of patient-doctor contamination.

3 Paredes, Carcavelos and Albergaria are located outside the city of Lisbon, but nearby the Portuguese capital city.

The Sanatório do Rego (Curry Cabral Hospital, Lisbon, 1908) is a clear example in which the separation of general infectious patients (such as STDs) from the tuberculosis patients took the form of a wall, separating the garden into two independent places. In this case, there were different gardens for each different kind of disease. In the tuberculosis area, the *pavilion* system was the chosen configuration to allow free air circulation. This model was accepted by the Portuguese physician Curry Cabral, in a place where the tuberculous patients had the privilege of living with the doctors, while enjoying a garden of their own. There were interesting particularities, such as the existence of a surgical pavilion for both the pathologies (tuberculosis and other infectious diseases). Security was firmly established based on trust, but that wall was responsible for the differentiation of the apparent common space: a garden for each disease.

The Sanatório de Albergaria (Arch. Rosendo Carvalheira, Albergaria, 1919) is recognized because of the particular form of a star radial implantation, with housing units in each wing. Its “wide garden spaces” were also destined for the patients’ walks but, at the same time, the house blocks also had individual gardens, following the previous reference to city houses (Sanatorio...Montachique 1918: 26). In this context, the sanatorium complied with the need for different housing for each patient, in a segregation-like model. In the Sanatório Sousa Martins, the report of the local Subcommittee of the A.N.T. indicates that, well before the project and the program itself were materialized, it was decided that patients’ accommodations should be separated according to their economic standing (Relatório...Guarda 1903: 139-140). There were special places for wealthy patients that couldn’t be crossed by third class patients.

Thus, segregation went hand in hand with a series of these programmatic concepts, such as control, surveillance and physical separation of patients, as a reaction to several variables. Patients were separated not only for economic reasons but also for gender issues, to avoid contact and relationships between men and women, since the *love affairs of patients* were accompanied by palpitations and much physical effort at the time. These restrictions worked as a form of moral hygiene. As happened inside the buildings, the circulation in the garden also obeyed distinct rules, in line with international models, such as the one of the Bligny Sanatorium, in France (CREM-NITZER 2005: 20).

The medical staff prescribed walking routines in the sanatorium, just as any other treatment or drugs, with special rules and designed for each patient: the contact and available time to use the gardens were prescriptive and scientifically based.

During his official study visit to a tuberculosis sanatorium for the poor in Madrid (Belas Vistas Sanatorium, Madrid, Spain, sponsored by the Portuguese Railways company), doctor Agostinho Lúcio stressed the importance of the garden as a therapeutic element. Lúcio described its gardens and shelter tents, interspersed with both footpaths/sidewalks and gardens. The prescriptive walks needed a special design to measure the amount of physical effort for patients: the walking distances in the gardens of this sanatorium were marked on the sidewalks using white brick. Along the same pathways, there were crockery or enamel spittoons, since it was forbidden to spit on the ground, under penalty of immediate expulsion. Whenever possible and depending on the doctor’s orders concerning the balance between resting and walking, or also by prescription, some gardening work was allowed. (LÚCIO 1916: 7). In contrast, in the previously mentioned Sanatório Sousa Martins, the wide avenues alternated with high-density green areas, and the walks through the woods and gardens were considered as distractions, since “the spirit can fatigue, but healing always wins” (*O sanatório...Martins* 1913: 76-78). That physical position of effort was different from the “quietness” of the gardens in Bissaya Barreto’s ideals, in Coimbra’s sanatoria (COLLAÇO 1936: 43-50). The question of physical exercise (especially when assessing effort), was taken into

careful consideration and frequently revised due to the characteristics of the disease. Walking in the woods or in the gardens was continuously prescribed, contrasting with the images of absolute, forced and controlled rest in the healing galleries of sanatoriums.



Figures 9 and 10. Sousa Martins Sanatorium: romantic garden and water elements. c. 1930s. Private collection; Covões Sanatorium (Coimbra): walking and exercise. c. 1930s. Arquivo História Bissaya Barreto, postcards

In this sense, the garden worked as a functional diametrical extension to the resting chair that anchored the patient to a platform with the use of a systemic and regulated immobilization. The garden was, therefore, an instrument of both mobility and socialization, with special features such as benches, water fountains or even caves.

The cure gallery, like any other spatial configuration of interior- exterior boundary was characterized by the territorial marking of the sanatorium space, or more specifically, as a demarcation of its *spatial* borders. By definition, the cure gallery was the space that confined the contact of the main façade of the sanatorium with the garden. The gallery was not only for treatments with sunlight or air exposure; it was as a primary link to the garden, working as the first stage of the interaction with the outside world.

In between the building and the gardens, the healing galleries functioned as the second or intermediate layer of the sanatorium system. In those galleries, special regulations and programs forced the patients to be in complete silence and, in some cases, vertical settlements were used to prevent even eye contact and any distractions.



Figures 11 and 12. The Celas Sanatorium, Coimbra: cure galleries and its views to the therapeutic garden. c. 1930s. Arquivo História Bissaya Barreto, postcards

These platforms allowed the contact of the patient (often bedridden or resting on *chaise-longues*) with the air and/or sun, but also the visual contact with landscaping or the garden (or both, depending on the sanatorium's

location). Also, this visual contact was considered important for the tuberculosis treatment. The so-called “sights” were useful and fundamental for the healing of tuberculosis: consequently, the cure galleries were also a sight for the transition between the sicker and the sick: temporary landmarks of treatment success (CAMPOS 1934: 366-370). In 1899, Ferreira da Silva referred that the cure galleries, where the “patient can breathe freely” - should be ornamented with plants because, in addition to a decorative function, it would benefit the patient (SILVA 1899: 67-70). Forty years later, the same natural-iconic presence can be found in the Sanatório Dr. Vaz de Macedo (c. 1930, Covilhã), through the use of flowerbeds attached to the main façade, which was punctuated by shrubs.

Also, at a second level, the transparency of windows as architectural diaphragms permitted visual access to the garden. In the Bissaya Barreto’s Sanatório de Celas (1932, Coimbra) the light penetrated directly through the windows to allow a more controlled use of heliotherapy. At the same time, the inside-outside connection was always a priority, to consent the vision of “the soft symphony of the colors of the rectangles of the garden” (COLLAÇO 1936: 43-50). In this sense, cure galleries operated concomitantly as heliotherapy platforms and as a space of contemplation of the frontal green spaces. So, the contemplation of these gardens through a *plateau* constitutes also a functional therapy of the garden.

After the building and the cure galleries, explored in many studies related to the history of tuberculosis and the history of sanatoria, the garden is highlighted as crucial for the treatment. The therapeutic garden is, by definition, not only a concept of programmed and equipped space for the treatment of patients. It also performs an important function in the prevention of contamination and the hygienization of the air, to reduce proxemics in patients and, finally, to promote their enjoyment and social acceptability. So, the flora of the garden and the use of different species of plants were also elements of study by doctors and architects.

The garden, particularly in a bosky-like configuration, was especially beneficial to the system: while allowing the oxygenation of the respiratory organs of the patients, it also functioned as a purifier of the sanatorium air (taking the form of a filter of particles). It was also considered as a protection against the excessive moisture protection of the soil. Therefore, sanatoria should remain in the vicinity of a forest, namely a pine tree forest, “whose leaves persist in the winter and are sufficiently dense to prevent the circulation of air”, because “tuberculosis seems to retreat towards a forest.” (SILVA 1920: 57-58).

The selection of deciduous leaf trees functioned as a symbol of the inexorable passage of time. These trees also provided shade to the patients who were using the garden during the summer and also allowed longer sunshine during the winter. In 1902, it was indicated that sanatorium flora should be close to “balsamic tree forests with pine and eucalyptus trees” (MONTERROSO 1902: 54). In the case of the Sanatório D. Carlos I (c. 1909/10, Lisbon), the recommendations indicated that permanent leaf trees should be replaced with deciduous leaves or fruit trees, so they would not block the sun during the winter, allowing a full projection of the solar rays on the clay soils so as to drain the soil.

The special case of Sanatório Sousa Martins is, again, prevalent as example and model of the first decade of the 20th century for other sanatoria. Its lush gardens adopted a variable choice of flora, presenting a romantic formulation in its design. The garden features were selected to potentiate a special atmosphere for the mood of its patients: balconies, bridges and lakes. There were also fountains of love, sidewalks and caves that could lead to less desired encounters. (BORGES 2000: 321). It should be noted that the sanatorium pavilions’ model replicates, in shape and services, the model of a micro-city: the garden, with all its components, does not assume the role of an enclosed space, but rather the one of a city garden. At the same time, other sanatoria were mentioned as “balconies of health”, both in its advertising leaflets and in periodicals of the time (Estancia ... Serra 19--: 13).

However, in the gardens of those sanatoriums where Bissaya Barreto was in charge, it is evident that there were some differences. Besides the great investment of the physician in his conception - almost personal and in accordance with his principles - and even out of tune with dictatorial times and economic crisis, there is a great influence from the French and even English gardens, as seen in the sanatorium's color postcards. For the physician and Portuguese dictatorship associate, the garden was the true component of extension, of the emancipation of the sick, and of the true controlled freedom in walking and contemplation (SILVA, 2013).

In these gardens, meteorological observatories were installed, alongside non-scientific equipment, such as shelter tents and chairs. The Sanatório dos Covões (1935, Coimbra) was equipped with a greenhouse, filled with exotic plants and other species, under the permanent supervision of a gardener, who later distributed these plants to the gardens of the sanatorium (BARRETO 1994: 253). His presence complied with international standards: in the Sanatorium of Chatzalp there were also gardeners, although not in the style of the "tall and blond, who designs capricious designs on the lawn of the garden, as he also made his daily cure of air and sun (*Ilustração Portuguesa* 1911). Gardeners were present in Portuguese sanatoria both in management and planning functions, and also to educate patients, since doctor's prescriptions demanded gardening activities for some patients (ALMEIDA 2008: 49-58).

Sanatoria gardens can also be analyzed as the first element of contact to patients who were admitted into this closed system: they helped form the patient's first impression during admission, contributing to the reduction of the effect of stigmatization to which sanatoria and tuberculosis patients were subject to. Alongside, the garden was used to promote a positive image of the building, especially when it was in contact with a nearby urban factory or city center, while making the sanatorium unnoticed within the urban landscape.

It was also a properly controlled garden for the internal control of the staff, who policed contact between patients, especially from the opposite sex, when the sanatoria were for both men and women, to avoid relationships that were considered as destabilizing for the effective physical and moral recovery of consumptives. So, against the supposed indicated freedom of the garden, there was a gloomy policing across cure galleries and gardens. Again, the panopticon was linear and not rounded, assuming reciprocal directions: building-galleries-garden.

Using these same control lenses, there are two criteria that were most necessary in this closed sanatorium regime: permeability and permissiveness. In this way, the garden functioned as a membrane, allowing the patient to have a controlled escape, contrasting with the rigidity of the rules imposed inside the sanatorium. At the same time, it operated as a barrier to control the patient's exposure to external life outside the sanatorium, preventing the patients' direct access to the healthy, i.e., the dissemination of the disease to the healthy city.

Therefore, the garden operated as an adjuvant therapy - a therapeutic garden - along with other functions: healing or treatment platforms for the tuberculous patient, symbols of their (possible) freedom, although properly policed: for René Magritte, *ceci n'est pas une jardin*.

During the 1930s, there was a massification of the use of internal labor, already described in the para-sanatory system of the A.N.T. from 1931. In this case, with the support of agriculture and farming, it was justified as a contribution to the reintegration of tuberculosis patients, preparing them to return to society. In addition to gardens, agricultural plantations were likewise appended to this process. At the same sanatorium, 10.000 feet [3048 meters] of onion were "discreetly" planted to supply the sanatorium (Soares 1943: 8). The Sanatório de Louredo da Serra (c. 1941, Louredo da Serra), besides complying with the "most careful hygiene requirements, and being widely ventilated and illuminated", was "surrounded by a park, garden and fertile terrain for cultivation" (Estancia ... Serra 19--: 10). Water was present in the garden, as well as in the building. In the Sanatório de Celas and Covões,

most of the vegetables and fruits were locally grown (COLLAÇO 1936: 43-50), as in the case of the Sanatório da Flamengo (1949, Vila Franca de Xira). In addition to these practices, livestock breeding to feed the patients was supported, and these animals were fed leftover food from the patients, after disinfection. It should be noted that these products were often tested in guinea pigs to assess their safety (SOARES 1943: 10-11).

Weather conditions and the winter cold had consequences in the use of the garden, but the sanatorium program had its own solution. In case of inclement weather conditions, or during rainy winter periods, plants were transplanted inside the building and into a protected space, with the use of winter gardens. These winter gardens were properly explored in the first international sanatoria, as for example in the sanatorium of physician Roempler, located in the Giant Mountains in 1875 (KNOPF 1899: 100-102).



Figures 13 and 14. Winter garden, Brehmer's sanatorium. c. 1890 (Knopf, 1889); Winter garden, Sanatório Sousa Martins, Guarda. c. 1907. Private collection

In the case of the Sanatório de Santana (1904, Carcavelos), a mass-circulation newspaper - *Diário de Notícias* (*Sanatório...Santana* 1902) described the importance of the winter garden, in parallel with the galleries (ARRUDA 2004: 19). The main room was decorated with tiles painted by artist Jorge Pinto, and the center with “magnificent examples of palm trees” (CAMPOS 1908: 33-36). The presence of those trees, as mentioned in the example of Madeira and as repeatedly represented in innumerable photographs of the interior of sanatoria and winter gardens, is in agreement with the ideas of Ana Duarte Rodrigues (RODRIGUES 2017: 209-232). In all sanatoria these rooms were the *setting* for great musical, theatrical, radiophonic or filmic moments since the patients were hospitalized in the sanatorium for consecutive years, as Swiss physicians pointed out (MACEDO, 1929: 5-6). These spaces would serve to “soften the patients morally and to minimize, as far as possible, the inconveniences of isolation within the sanatorium” (*Assistência ... Tuberculosos* 192-: 13).

The patients at the Sanatório Sousa Martins used the interior winter garden, which was a completely glass-enclosed dining room, designed as “a beautiful winter garden for patients who remain in the pavilion all year round” (CORREIA 1912: 179). It was in the winter garden that “the patient felt good” (SILVA 1920: 63-67). These spaces were used by the most affluent patients of the sanatorium, and made fashionable by the *Magical Mountain* of Thomas Mann, where fiction is not representative of the reality.

Ábalos's vision of the modern(*istic*) movement is pertinent to understand the changes of the concept of the garden within the general panorama of architecture. The idea of nature, no longer romantic but in the fashion of the Corbusier machine, applies to a notion of speed that the hospital entails, but not the sanatorium. Scientific and medical views have a great impact on the garden, as does the very vision of nature (and its own ideology), despite maintaining its health-related nature. In his own words, “Nature will be so commensurate with sports, health,

and hygiene, that for that purpose, it will be flat, reduced to the ‘green surface’: *Res Extensa* + heliothermic axis” (ÁBALOS 2001: 76). In this regard, the gardens of the Villa Arpel of Jacques Tati’s 1958 film, no longer represent the purpose of large flowers, grottos or exotic species; they rather embody a critical view of the modern garden. Using Tati’s image, the protagonists’ hall - the Arpel - can be considered as a domestic version of the *panopticon* from Michel Foucault’s perspective. In this sense, and inside the house depicted in the movie, where modernity is described as ridiculous, there is also a different relation between the inside and the outside space used for the garden. So, the exterior and interior space were separated by “a thin, permeable glass”. At the same time, architecture has changed its methods and even applied X-ray theories, related to inside-out connections – as glass has remained a primordial element to allow sun and nature links (COLOMINA 2003: 12-37). Even at the dawn of the 1940s, improvements in sanatorium gardens, such as the ones of Sanatório D. Carlos I or Sanatório D. Manuel II, were considered as elements of the modernization of sanatoria (O chefe...privada 1948: 58; DGEMN 1947).

Contemporary case studies: the Sanatório Dr. José de Almeida (Lisbon) and the Sanatorio D. Carlos I (Lisbon)

The vision of the Modern Movement, hereby understood through Ábalos’s metaphor, can induce a new idea of the use of both therapeutic and non-therapeutic gardens in sanatoria. From the 1940s onwards, the changes in the sanatoria program have led to an apparent minimization of the healing character of gardens and the need for green architecture.

During Salazar’s Portuguese dictatorship (1933-1974), several changes were made in the A.N.T. political

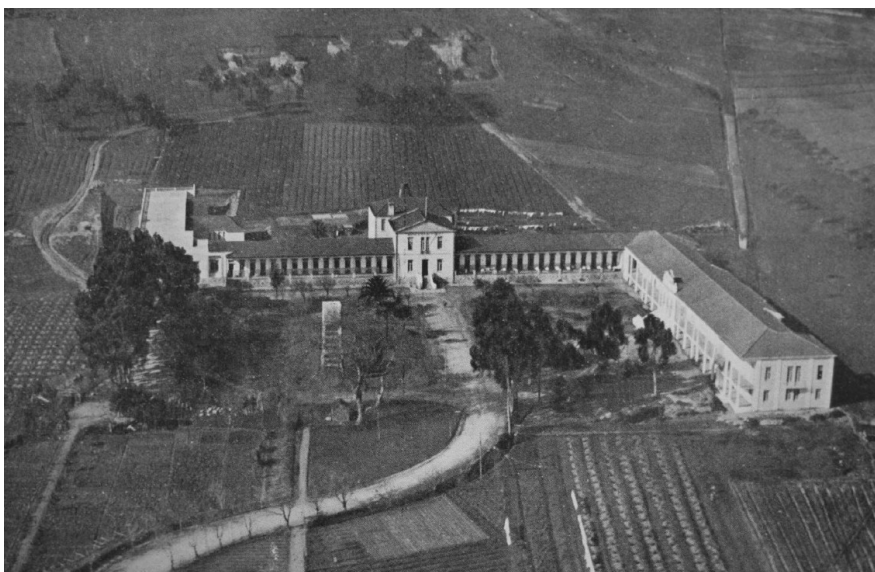


Figure 15. The D. Carlos I Sanatorium, Lisboa, before and after garden and building interventions, s/d; c.1935. (Neves 1937) and (Novos sanatórios..., 1938)

schemes, new sanatoria were projected and built, and existing sanatoria were expanded. Sanatoria in Lisbon are used as examples for these distinctive times of change: the Sanatório D. Carlos I, the Sanatório Dr. José de Almeida and the Grande Sanatório de Lisboa.

In the last 1946 revision of Vasco Regaleira’s project for the Grande Sanatório de Lisboa (Lisbon, not built) the architect emphasizes the importance of the garden, designed to shelter the patients and to provide a calm and restful landscape to patients in the healing

gallery. Details on the selection of flora are established in the architectural program, such as flowery gardens “of healthy joy so necessary to those who are sick” (Regaleira, 1946). A therapeutic garden is clearly assumed as essential for the *cure* in the sanatorium: if the so-called *cure galleries* are programmatic, then the garden should be referred to as *cure* or *healing* garden.

The 1947 Francisco Caldeira Cabral’s landscape project for the already mentioned Sanatório D. Carlos I was based on the afforestation of the circulation paths for the patients, but also on the completion of the sanatorium’s

natural fence (facing the surrounding streets)⁴. Six years later, in 1953, Gonalo Ribeiro Telles and Sampaio Fontes⁵ made a project intervention for the Sanat3rio Dr. Jos3 de Almeida (Parede, Great Lisbon).

It was intended to be a project for the main entrance only, a design of a garden that would create a spatial definition for both patients and visitors. Among the main area of grass, there were also trees and bushes, configuring a kind of fence to enclose the surrounding area. The mixing-border concept (adopted from English gardens), addresses a more natural and landscape-oriented approach. This choice is clearly more modern and natural-like than the previous sanatoria examples. Nevertheless, the human scale and the height of the natural elements, just like in Le Corbusier's Modulor anthropometric system, was studied to the smallest detail. A bird feeder element, stairs, stone pathways and water gave the atmosphere both a natural and human ambience.

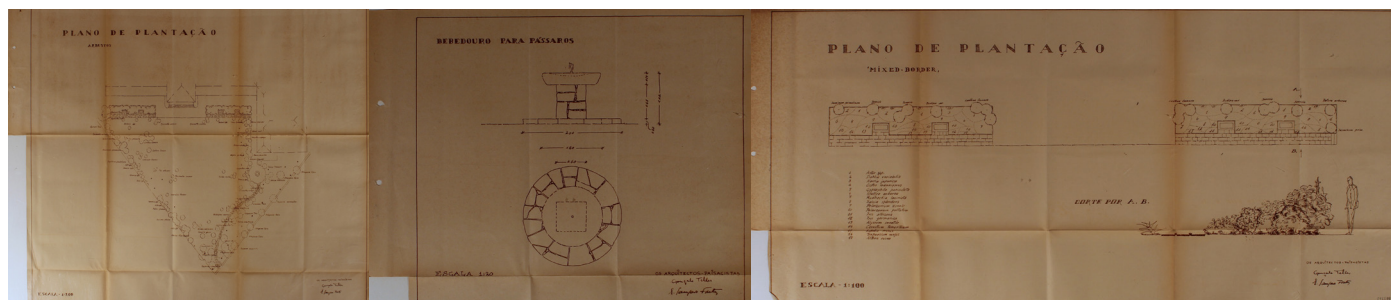


Figure 16. The Dr. Jos3 de Almeida Sanatoria (Parede, Great Lisbon), landscape plans, mixing-borders and bird feeder details. Gonalo Ribeiro Telles and Sampaio Fontes, 1953. SIPA, des. 815537-42

Final Remarks

Tracking the circulation of knowledge through books and travelling accounts allows the construction of a patchwork related to garden and landscaping issues. Therefore, it can be argued that medical ideas – both empiric and scientific – were responsible for garden programs and their ideological concepts, and even conducted architectural demands. Tuberculosis architecture presents prolific examples of this and the Portuguese sanatoria work as illustrations of these conceptual changes.

At the same time, peripheral Portuguese cities adopted, both at the level of a global or local organization, the international concepts of sanatoria and their garden morphologies. The mentioned sanatoria expressed the non-ephemeral character and design of their prophylactic and therapeutic gardens, as also the medical prescriptions behind the programmatic schemes.

Nevertheless, until the use of safe and reliable chemotherapeutic drugs came to be common in the 1940s-1950s, the therapeutic garden sustained itself as one of the most important systems (and iconic symbols) of the sanatoria. It was a free green space for socialization, but also to prevent contagion (through the purifying effect of the air and the improvement of proxemics). It was a significant part of a linear panopticon (sanatoria building – rest galleries – gardens – fences). Thus, it was also a crucial space to improve the life quality of tuberculosis patients and promote their amusement, as they were bound to a coordinated and strict regulation program that usually demanded for years of treatment.

After drugs came to be applied, the garden worked mostly as a decorative element and, in several cases, it was

4 See SIPA Archive (Pt), Francisco Caldeira Cabral estate, Process 3-47, Grande Sanat3rio de Lisboa, n. 1-4. Francisco Caldeira Cabral had already worked with Regaleira in 1947 at Quinta da Ribafria Palace in Cascais. For the expansion of the D. Carlos I Sanatorium, see Process 3-47, Ampliao do sanat3rio Popular D. Carlos I, n. 1-33.

5 Both very renowned landscape architects, especially for their project for the Gulbenkian Foundation Building in the 1960s.

projected but never built: the garden also suffered the impact of the medical death of the sanatorium as the only possibility to improve or treat tuberculosis.

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