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" HOSPITAL OUTDOOR AREAS TRANSFORMED INTO HEALING SPACES:  
DESIGN TO FACILITATE THE RECREATION AND THERAPY OF IN-  
PATIENT CHILDREN WITH PHYSICAL DISABILITIES"

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## **Abstract**

This dissertation is concerned with healing outdoor spaces in pediatric hospitals. It tries to find if a well-designed space can facilitate the healing process of in-patient children with physical disabilities. It seeks to discover design principles that landscape architects might use, in combination with what the users would want. For that reason a literature research was conducted, and landscape architects, hospital staff and children were questioned. The literature provided the background and the answers about the child psychology, the value of environment in one's treatment procedures as well as some guidelines of how to design such spaces. From the survey information, the interviewees' beliefs about the general values that this place should have and what special environments or details they would prefer to have, were compared and combined, in order to find how these areas should be designed. One of the findings was that external spaces are highly esteemed as valuable resources for the children's mental and physical health. The environment that was asked for was a safe one, with many opportunities for activities and interaction with peers, as well as privacy and exploration. Features preferred were play equipment, steps and other facilities used for exercises, patios, nature, sensory trails, everything that will help compose a relaxing and invigorating setting for children as well as their families, their visitors and the staff.

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## INTRODUCTION

The profession of Landscape Architecture has always striven to create a distinctive, practical and beautiful environment. Everyone prefers being in a beautiful, well-designed outdoor space than stuck inside a building. It is a fact for the common sense, but there are also studies giving reasons for such a preference. Outside one feels free; the senses are more acute, there are more things to do and place to go.

Children are a group that enjoys and needs being outside. They are usually very active, want to move around and discover things. The situation gets complicated when a child is used to be able to move around freely and then due to a reason that he/she cannot fully understand, is stuck in a hospital. When a child has had no previous problems with its health and at some point it needs to be confined he/she feels very deprived. They feel lost in a new world that has many rules and many restrictions. Most of the hospital grounds are not planned for them. But there can be such grounds, areas to let loose, find privacy and at the same time possess therapeutic value.

Healing gardens become more and more an area that Landscape Architects are getting involved with. In the literature one can find many examples of such landscapes created for mentally ill, elderly, people with terminal diseases, children. This dissertation is concerned with children. The aim is to take the research a step further in a special category: children with permanent or temporary physical disabilities, who are able to walk (even with aids or wheelchairs). It is the writer's belief that if there is provision for this category of patients when an outdoor space is designed, it can help children to recuperate faster, reinforce their dexterity and interests. These children are confined due to their situation. To confine them more because there is provision for them only indoors is not the best facility that can be provided to them.

All the above were early personal speculations, the research was conducted in order to validate their rightness. The first question that needed answer was whether a space can benefit to them. That leads to the other ones; how this space should be designed, what are the needs and guidelines for such an area; what the users -hospital staff and children- want and how they can be provided.

## 1.1 Methodology

To answer to the above questions primarily a research of the existing literature was conducted. Since there was no existing literature strictly focused on the particular subject, allied subjects had to be searched. For this books and journals about the psychology of the child, the healing dimension of the landscape, the use and construction of playgrounds, the child like and dislikes and the rehabilitation settings of hospitals were the basic areas of reference.

Then comes the survey information. Three dimensions of the subject were highlighted; how to design the setting, in what way it will be used and how it can be attractive to the users. For example a landscape architect might be asked to design the hospital garden and it might be a work of art, but not a healing space. For it to be used as part of the treatment one must think of the therapeutic elements that can be incorporated, the needs of the children to have their exercises, their play therapy sessions and also the expectations of the staff for this area. At last it should be appealing to the eye, give an open invitation to be used as an enjoyment, induce people to use it, and provide the treatment unconsciously.

For that reason three categories of people were questioned: landscape architects, hospital staff (physiotherapists, occupational therapists, nurses) and children. For the nurses and the occupational therapists unstructured personal interviews were used. There was a set of questions that all of them were asked, but besides that it was found more productive to have a loose, thorough conversation. Before the interview I was inspecting the outdoor area of the particular hospital, so as to use it as a reference point during the interview. It was useful to have a clear image of what the subject was referring to when answering "I use the equipment but want more" or "we have the best garden", or "wheelchair can go around"-but just make a round and stay at the corner with not a single facility. Seeing the space can give the right dimension to these statements.

Unfortunately, due to the shortage of time, there was no ability to have the same practice with the other two groups. Thus questionnaires were sent to the landscape architects and the paediatric physiotherapists. The questions were open-ended (only two questions suggested some possible answers). For the last group the children personal interviews were conducted. Sets of different coloured illustrations of hospital gardens were used as a starting point. Children were asked what their likes and dislikes are, how they would like to use spaces

illustrated or imagined, to give conclusion of what kind of settings would be more appealing to them.

The above conclusion, together with all the rest is pointed out at the final part of this dissertation. The final stage is the personal thoughts, deducted from reading, observing and acquired from interviews and questionnaires, of the designing principles that an outdoor area of a hospital for physically disabled children should be based on.

## 2. LITERATURE REVIEW

### 2.1 Healing environments. The psychology of the landscape.

The idea of a healing garden is both ancient and modern. Long after humans had begun to erect dwellings, local healing places were nearly always found in nature—a healing spring, a sacred grove, a special rock or cave. The earliest hospitals in the Western world were infirmaries in monastic communities where herbs and prayer were the focus of healing and a cloistered garden was an essential part of the environment. (McBride, 1996)

A fundamental belief in the positive health benefits of contact with nature has already played a major role in shaping the urban fabric of Britain. For example, Victorian reformers promoted the establishment of the public park system on the basis of open green space were beneficial for the public health (moral as well as physical), while the Garden City Movement based many planning policies on a positive connection between green space and human well being. (Thompson, 2000; Miles M, 1990)



Photo 1: The 'verandah' treatment at St Thomas's Thames-side was common until the 1960s. (Haggard and Hoskin, 1999)

Increasingly technical approach in surgery, medicines, diagnosis, gradually superseded the connection between healing and nature. A separation occurred between attention to body and spirit. By the late twentieth century in many health care settings, landscaping came to be seen as decoration. (Dannenmaier, 1995) What is left is the land between the buildings, which may still be generous but will be made up of many patches between and around buildings. (NHS, 1991b) Difficult situations like this require experienced people, but the landscape architect is frequently not consulted or involved until it is too late (Hagedorn, 1990) Money is genuinely constrained, while low value is placed on the aesthetic benefits for patients and staff of quality land usage. (Capability, 1990; Brookes, 1990) Though the scenery is changing; the organisation that accredits U.S. care hospitals now requires hospitals to provide "access to the outdoors through appropriate use of hospital grounds, parks, playgrounds, or adjacent countryside" for certain patient groups (paediatrics, long-term care). (Gora, 1997)

One should always have in mind that it is significantly different curing a disease and healing people. (Thompson, 1998) The term "healing" refers to a beneficial process that promotes overall well being. Gardens can be healing via a number of mechanisms. (Canter, 1979) Being outdoors, experiencing sunlight, viewing trees and flowers, listening to the sounds of water or birdsong-the combination elements that make a garden, can have measurable stress-reducing benefits. Gardens support other sought-after activities beyond the basics of being in a plant-filled space, like encouraging people to socialise, or be alone, to stroll or exercise. (Parry-Jones, 1990; Ford, 1997)

Facilitating an improvement in the overall sense of wellbeing and hopefulness is a way of assisting physical improvement. For patients with chronic conditions, a sense of wellbeing will often be reflected in an increased level of functioning. For those who are recovering, hopefulness has been proven to be a significant factor in the rate of improvement; to facilitate hope is to enhance health. (Lewand and Uzzell, 1990; Radley, 1983)

The most comprehensive study looking at hospital healing gardens was done recently by Marcus and Barnes. Results presented an overview of garden use, and reactions of patient and staff to the gardens. Reactions were almost uniformly positive, reporting favourite changes in mood as a result of garden use. When asked which specific qualities seemed to be helpful, more than two thirds mentioned elements of the plant world (trees, flowers, colours, seasonal change), or elements that stimulated senses (birdsong, the sound of water from a fountain, fresh air, fragrances). In a similar study, Cooper-Marcus surveyed 154 landscape architecture students about the restorative aspects of environments. Subjects were asked to assume that they were feeling stressful or depressed and to choose a place so as to feel better. Overall, there was a large preference for a private escape in a landscape, especially in one that contained a water element. (Whitehouse, 1999)

At Uppsala University Hospital in Sweden, 160 patients who had undergone heart surgery were assigned to different visual stimulation conditions; two were nature pictures (either an open view with water and trees or an enclosed forest scene); two were abstract pictures (dominated by either rectilinear or curvilinear forms); and two

were control conditions (a white panel, or no picture or panel). Results suggested that patients exposed to the open view of water and trees experienced significantly less postoperative anxiety than others did. They required fewer doses of strong, intravenous pain drugs. The enclosed forest setting with shadowed areas did not reduce anxiety compared to the control conditions. Unexpectedly, the rectilinear abstract picture was associated with higher anxiety than the control conditions, indicating that psychologically inappropriate visual stimulation can sometimes elevate rather than reduce anxiety in acutely stressed patients. (Barnes and Marcus)

Another research conducted by Ulrich (1984) showed that visual contact with nature can have important positive influences on health outcomes. Data on recovery outcomes were obtained for pairs of patients who had similar variables that could affect recovery such as age, weight, tobacco use, and previous medical history. The patients were signed to rooms that were identical except for window view: one member of each pair had a window overlooking a small grove of trees, whereas the other's window looked out on a brick building wall. Results showed that patients with the nature window view had shorter postsurgical hospital stays, tended to have fewer minor postsurgical complications such as persistent headache or nausea, and received far fewer negative evaluative comments in nurses' notes. Moreover, the wall view patients required far more injections of narcotic pain drug, while the nature group took more oral doses of weak pain drugs. Ulrich noted that expenditures for hospital care are so large that even a light reduction in inpatient days (in his study, patients with the tree view stayed 8.5% fewer days) could produce yearly savings of several hundred million dollars. (Haggard and Hoskin, 1999)

## **2.2 The effect of being outdoors for children.**

Dr Graham (1994) made a research on the responses and the power of concentration of children attending two nurseries one with a spacious playground with basic pieces of play equipment and few trees and other with wilderness area and a variety of 'adventure' equipment. The result of the study was that less than 3% of them were ill at the latter school, while 8% at the first. Motor function was better as power of concentration. (Gora, 1997)

Various studies in children have indicated that contact with nature can help encourage a positive behavioural change, reporting how activities with wildlife or animals can help

children with behavioural difficulties to develop feelings of care, responsibility and self-worth. They emphasised the value of the outdoors for providing a relaxed, supportive setting for children; even children who find classroom discipline impossible can find outdoor activities less stressful, as it allows them to release energy and tension in a relaxed, safe and controlled environment. (Plank, 1962; Routledge, 1978)

The Learning Through Landscapes study (after collecting data from 400 special schools throughout the UK) concluded that well-designed grounds can simultaneously encourage the development of physical skills, the building of confidence through exploration of the environment and the acquisition of behavioural skills through learning to participate and share with others. (Stoneham, 1997)

For children 'indoors' is a private domain, the source of physical shelter, social security and psychic support and also the locus of adult dominance and the limiting effects of 'family' and 'school'. 'Outdoors' is a necessary counterbalance, an explorable public domain providing engagement with living systems and the prevailing culture, the locus of volitional learning and direct experience. The 'outdoor behaviour' is different from 'indoor behaviour'. Outside there is a sense of freedom; it is acceptable to shout, run, and sit the ground while indoor these things are not so acceptable. (Dudek, 1996; Oswin, 1978; Scottish office; 1993)

It is vital for children to have contact with outdoor and natural environments, children can have intimate contact with basic elements of life: sunlight, fresh air, soil, water, plants, and animals. "Outdoors" has a variety of terrains: smooth surfaces for wheels, grass for soft landings, soil for digging and vegetation for hiding in. It permits varied social interaction as other children and adults pass through it. It is non-static, being



Photo 2: In the ASLA Award winning Therapeutic Garden for children at Child and Adolescence Development, Massachusetts. The garden is witnessed to primarily soothe the child's soul by providing shelter and calmness and then help to gain confidence through exploration and risk taking. (ASLA Awards, 1997)

subject to changes in weather and to seasonal changes in flora and fauna. It can be an environment of sensual variety which challenges children for freedom of movement and daring. It can have cosy quiet spaces for withdrawal and security, as well as open social places for group activities. It can provide learning opportunities through functional, constructive or dramatic play; to explore, dig, transform, and observe from various levels and perspectives. ( Pringle, 1974; Defence works service, 1995)

The health aspects of being outdoors are also important; There is an assumption that children who play less out of doors suffer from more colds in the upper respiratory ducts and tend to be more often absent from school than children who were outside more. (Smith, 1986) Also another research, about the effect of windowless classrooms on elementary school children, showed that the absences from the school were much higher for the kindergarten children at the period of time that the windows were removed. (Larson, 1965) When being outdoors benefits children while they are healthy, one certainly expects that when they are recovering from illness or surgery or awaiting an operation can profit from a short play period outside.

## **2.3 Hospitalised children**

### **2.3.1 Children and the hospital environment, play helps.**

Children in hospital ward are living in a strange, sometimes frightening environment that they cannot fully explore. (Noble, 1967) A good quality service for children should provide for the child as a whole, for his complete physical and emotional well-being and not simply for the condition for which treatment is requested. (Scottish office, 1993) They need to work out their problems and gain mastery over their feelings of helplessness by gaining mastery over materials. Play reduces the anxiety felt by children in hospital by allowing them to express and work through their fears, as an escape route, by providing support, information and affiliation with staff and the environment. (Hall and Stacey, 1976; Pringle, 1974; Brown and colleagues, 1999) One of the striking findings of the in-ward studies was the long hours that children spent unoccupied, without their parents or visitors. This constituted at least half and in some cases up to 80 per cent of the child's waking hours. Play keeps them occupied so that they feel less lonely and inclined to dwell on the unpleasant sights and sounds that a hospital stay involves. (Hales-Took, 1973) It stimulates them, so they avoid becoming

apathetic and unadventurous, while they develop their physical, intellectual and social skills by offering creative materials and a group of peers. (Grisworld, 1994) Moreover play helps them release the excess energy that they have and assist them to sleep well (Lean, 1980)

Play prevents them from feeling separation and anxiety and minimises the chance of their total development becoming arrested or delayed. (Hales-Took, 1973) As play is natural to any child, to be able to play in hospital is an important way of preserving something of normality for him in what is a totally abnormal setting, and may well speed his convalescence and recovery. “Purposeful” play insulates him from the distracting, worrying things that may be going on around him. “Domestic” play on the other hand reproduces the things one does at home, helps to keep “home” and “mother at home” alive to the child. (Noble, 1967; Department of environment, 1973)

### **2.3.2 Outdoor as a treatment area, rehabilitation setting**

Besides, play can be used as a diagnostic instrument, or can carry a therapeutic import (for example, catching a ball with one's 'bad' hand) and it is more relaxed and comprehensible way of having their treatment. (Elliot and Aderson, 1978) For those who have some kind of disability or have been denied the use of one or more of their senses, an outdoor area can stimulate the use of all faculties and help the process of recovery or readjustment. (Dannenmaier, 1995)

Certain outdoor play equipment has been shown to benefit upper body muscular strength and endurance. If movements are badly co-ordinated large items of equipment can help to develop gross motor skills. Sand play, toys, building blocks and the natural environment help with the process of fine-tuning, while studies of movement patterns demonstrate how co-ordination increases with constant practice and frequent use of playground equipment. (Herrington and Stundmann, 1998; Christopher-Pool, 1995)



Photo 3: A physically disabled child is riding her hand motivated bicycle at the Learning Curves, Meldreth Manor School. (Thwaites,



Photo 4: The Learning Curves are designed to be used by all people of all abilities, in a way that it intrigues all the senses with its interacting water features, activity platforms and play opportunities, spurring children to wander around using their own powers. (Frank. 1996)

Facilities should provide the development of large muscle skills, but also orientated towards direct involvement with the environment through exploration, manipulation and novelty. Outdoor creates opportunities for children to develop large muscle control while exercising in fresh air. (Mils and Still, 1986) Children of various motor development abilities should be able to find areas and equipment that match their developmental needs, in which to experience new challenges in climbing, balancing, or jumping. Each new challenge accomplished can build self-confidence as children discover what their bodies can do. (NHS Estates, 1991a)

An external assessment and therapy area provided for children, with a range of paving and fittings for testing and mastering skills related to walking, stepping, climbing and learning to use walking aids and wheelchairs, in a realistic everyday setting. (Ford, 1990) Walking in corridors, dangling legs over beds, or any other physical activities reduces the pooling of blood in the extremities, drains the bladder and improves muscle tone, all leading to a swifter and more successful recovery. Typical stays cut from two weeks to twelve hours and from six weeks to two weeks, respectively, illustrate the dramatically shorter hospitalisations resulting from stimulating the patient. Unfortunately, such stimulation must often occur in areas ill suited to the task-hallways, cramped rooms, or waiting rooms and lobby areas open to the general public. It feels different walking

outside; textures differ, sensory impressions are richer; there are less things to hold on to; one is more exposed. (Hagedorn, 1990) Children are much more easily persuaded to make their exercises when it can be a fun doing so. A proper setting can urge them to move around, learn to walk with their aids or use their wheelchairs not because it is the time for the exercise, but because they willingly want to play and explore the whole area, to see everything. (Kahn, 1993)

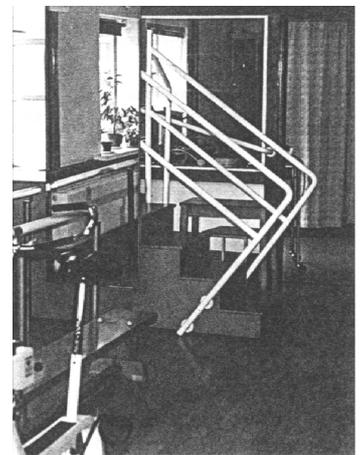


Photo 5: A typical setting in a physiotherapy department. An outdoor environment can provide the same chances for a person to train him/herself, with one exception, it might be a more relaxing and interesting environment. (NHS, 1991a)

## **2.4 Design guidelines**

### **2.4.1 Child preferences**

For a person to design a setting for children one must look at what their preferences are. Piaget's (1966) theory would predict that young children, ages 3 to 6 (pre-operational stages), respond to places where there are enough opportunities for solitary, functional, active and fantasy play. Children from 7 to 11 (concrete operational stages), favour environments for active use, while they start to co-operate with peers. Piaget also pinpoints that this age group tends to equate 'life' to 'movement'; a bicycle or a cloud is considered 'alive' because it moves, whereas a tree or a table is perceived as devoid of life because they do not move. Similarly they categorise environments as having life (movement) while others do not. From around 12 and up children tend not search so much for activities, but look for environments that support socialisation with peers.

Among different age groups there seems to be a difference in the range of the areas that children go to. The home range of the youngest group (4-5 years old) has the form of a compact home-based bubble; they prefer familiar places within the range of vision from their parents/caretakers. The range of 6 to 9 years olds expands in area, while from 10 to 12 years, children feel free to wander around in unfamiliar places. There also seems to be a difference between the sexes: girls prefer safer areas for arts or "fake" play, whereas boys go more often to wild areas and other "risky" places for energetic play. (Holme and Massle, 1970; Smith, 1986)

According to Andel (1990), cited by Whitehouse (1999) the places children perceive as attractive are: (1) places full of activity, or that support varied activity, fantasy or construction play. (2) Places where interaction with other adults and children is possible. (3) Places with variety in the environment, design or diverse possibilities for use are present. (4) Places with natural elements, such as vegetation, water, wildlife. (5) safe, intimate, and hidden places, as well as exciting and dangerous ones.

Children are also found to value natural environments, green spaces more than manmade environment. (Lucas, 1995) They are interested in minute details dwelling on objects and pockets of space or elements that look gigantic to them. They like the

component of surprise and vigilance from hideouts, watchtowers, hidden entrances, disappearing tunnels. (Hardy, 1999) Knud Jensen founder of the Lusianna Museum, in an interview by Holden (1998), says that children are not interested in adult visual art. One should create works of art for them with the use of an artistic language and create things that can become places or tails in their imagination. (Herrington and Studtmann, 1998)



Photo 6: The Leichtag Healing Gardens, at San Diego's Children's Hospital is designed as a series of rooms, which draw children in to explore. A centre "shadow" wall encompasses brightly coloured steel panels with animal cut-outs representing over 40 species that children can name or look through. Children like to hide behind it and play "peek-a-boo" through it. (Whitehouse)



Photo 7: Many small sculptures set into the planting beside the pathway, and on the lawns are especially attractive features of the Boston Children's Hospital garden. On one day in mid-November, yellow chrysanthemum flowers picked from the snowbound, fading perennial border had been placed (most likely by a child) in the mouths of the bear and the fox, and in the arms of the boy statue. The sculptures with their small size appeal to children. They great delight in finding and naming these figures, more so because they are half-hidden. (Barnes and Marcus)

#### **2.4.2 Creating an environment for hospitalised children**

To provide for the diverse interests and abilities of children, a variety of types of materials and landscaping should be available. Flexibility should be provided in every aspect of the area to make it versatile and interesting. (Leccese, 1994) It can be planned so as to accommodate varying group sizes and overall numbers of people, with different seating arrangements and environments for people to choose from. (Stoneham, 1990) A part of it can be designed to be converted into a temporary stage for children performances.

Children's moods change along with interests so the environment should provide materials and arrangement that change regularly. (Herman, 1994) Some features should be complex and usable in a variety of ways to stimulate creative abilities, yet other features should be stable and provide some security in the surroundings. Children

need creativeness, arousal of curiosity and opportunity for novelty, imagination, challenge. (Leccese, 1994; Herman, 1994)

There are different ways to challenge a child. One will need to overcome shyness in playing with other children. Another may be challenged by the idea of simply going outside, until it feels ready to explore unfamiliar areas. Clear distinctions should link settings with graduated challenges so children can progress from the simple to the more complex with relative success.

However some children seek rest. They need quiet, peaceful corners to recuperate. Also the opportunity to visit with family or friends is extremely important to most patients. Such visits provide contact and continuity with a patient's normal life. (Bechtel, 1997) Visits may be emotionally intense, may focus on confidential issues, or may be a limited time in which to re-establish family dynamics. Such interactions require a supportive environment; yet the patients' rooms are sometimes depressing or not private for visitors to gather there. Privacy might be found in the garden in subspaces that can support small, informal groups (Herington & Studtanann, 1999). These quiet zones for sitting, reading or talking should be away and clearly distinguished from active zones for running, active pretending, or rough and tumble play.

It has to be child-centred in scale and design, well equipped for play, welcoming and friendly, functional but not institutional to make children feel comfortable. The scale can be deliberately reduced in size to child scale. (Laurie, 1986) But most of all, it should be a place to let loose, get away from the restraints that a hospital stay entails. (Dannenmaier, 1994) For that reason it must transmit to children, and more importantly to parents and medical staff, the assurance of being secure, easily supervised, an area for risk taking without peril. (NHS, 1993)



Photo 8: A child-scaled garden; the Leichttag Healing Gardens. The garden sends the message from distance, colours, features all say "this is a child's world". But as Whitehouse (2000) has pointed out, child orientated at its scale, not its purpose. Two-thirds of the children want more things to do. Some seek distraction by trying to plug up the fountain jet or swing from the dinosaur. The features now have signs demanding "Do not ...:" But freedom is what children ask for when they get out of the hospital.

It has been suggested that some qualities of an Adventure Playground may in fact be especially suitable for a hospital outdoor play space (Barnes and Marcus). The handicapped Adventure Playground in London was created for children with a variety of disabilities. It was a place to explore the limits of their individual capabilities and 'dare' within the boundaries of safe practice. (Hurtwood, 1978) Due to safety concerns about some of its practices (like children building their own climbing equipment) this kind of playground is now abandoned. In their place Adventurous Playgrounds use standardised materials, but keep the sense of control and mastery, characteristics clearly valuable for those whose life is beyond their own control in a hospital setting. (Canter and Canter, 1979)

### 2.4.3 Engaging children's senses

Children whether bed-bound or up and about, enjoy observing and caring for animals, whether it is a fish in a bowl, caged birds, hamsters or rabbits provided by the hospital research divisions or a local zoo, or wild birds, amphibians, insects. A fishpond is quite engaging, especially if it is spanned by an observation bridge, or it is connected with activities such as picking miniature wildlife from it and observing it. (Plank, 1962) The whole garden can be dedicated to wildlife, or more simple ideas, such as a group of carefully selected plants to attract butterflies or a bird table with a nearby nestbox, can be a magnet (Avon wildlife, 1988)



Photo 9: A pet is a nice distraction and it is nice to have someone to look after, especially when one is used to be taken care of. (Hurtwood, 1978)

For children undergoing hospital treatment planting a seed, creating a new life that with care thrives is a meaningful activity. It helps them understand that improvement can happen through endeavour and nurture. (Gidson, 1996; Simson, 1998) Watering cans left casually in the garden can encourage children to collect water from a faucet and water the plants, engaging them in using the garden actively. They can engage themselves in horticultural therapy in extensive programmes or in dynamic subjects as sunflower and pumpkin (Thoday, 1982)

Skills learned in gardening activities are transferable to other settings and offer the experience of success, which reinforces a sense of mastery and heightened self-esteem.

Planting can extend therapeutic opportunities by stimulating awareness of seasonal change and keeping patients in touch with the outside world. It provides sensory interest and relieves the hospital's institutional aspects by creating natural views or a homelike environment. (Please, 1994; Simpson and Status, 1998)

Plants with strong fragrances are a valuable element. Hospitals have an immediately noticeable odour that may evoke fear, apprehension or recall of traumatic experiences in some patients and visitors. People in hospital courtyards and roof gardens often remarked how good it feels to smell trees, grass, and flowers as a respite from the prevailing antiseptic odour in the hospital building. Fragrance can coincide with the visual way-finding structure of the garden; for example, reinforce the perceptual impact of a central nodal point with a heavily scented species.(Gaskell, 1994)



Photo 10: Signs are everywhere at the Lucas Gardens, urging: "Touch the flower", "Spin the mill". Here they have "Smell the plants", "feel the wind". (Barnes and Marcus)

Fragrance is one element that composes a multisensory environment, sound is equally important. Plants, water, wildlife or man-made features can all contribute to the meld of sound in a sensory garden. There can be wind chimes, bells, and a suspension bridge that taps as children walk to give enriched experiences with sounds. Moving air can generate interesting background sound, particularly during the summer months in areas that have healthy, mature deciduous trees, bamboo or grasses. Possibility for creating sounds can take form of musical plates in the ground, used as sound maps for visually-disabled children, or for group playing tunes. The acoustic landscape should be low key and simple in form, as hearing-impaired children have difficulty discriminating complex acoustic dimensions. Harsh, high frequency noises, should be avoided as they are very uncomfortable, especially for the hearing-impaired. (Heseltine and Holborn, 1987; Craig, 1993)



Photo 11: Taking music lessons at the garden have great fun. Lucas Gardens School for disabled children has converted the garden into an open classroom, having most of the activities outdoors. (Barnes and Marcus)

Water can play an important role in any sensory garden whether constructed on the large or the smaller scale. The sound of running water, the feel of cooled air, the calming view of a lake are important elements for such place. Water play such in paddling and splash pools is good fun for most children. Patting, shovelling and pouring sand or sawdust seems to be as satisfying and calming to them (Smith, 1986).

Sand or sawdust in a wooden box makes an excellent platform for manoeuvring small animals, or toys. It can be transformed into a medium for dramatic play. Sand play should be placed in quiet wind-free areas capable of being shaded at midday

and early afternoon, being covered when not in use. A raised sandbox is preferable to a recessed sandpit as disabled children can easily use it. (Heseltine and Holborn, 1987)

For the other sense, sight, diversity and change are the key criteria. Design, plants, structures should be eye-catching and full of interest, the sort of things that will spark off a conversation or trigger a game or activity. One should note that children tend to recognise only primary colours and are attracted by high colour contrast. (Bennet, 1999) Also they do not fully comprehend complex shapes. Thus, their environment should be designed based on primary forms and warm but not over-excitabile colours, introduced through the equipment, the surfacing, planting and murals either on walls or ground surfaces. (Dudek,1996) Some people suggest that for activity areas bright primary colours (reds, yellows, and oranges) should predominate, while for quiet areas the predominating colours should be greens and blues. (Children play areas)



Photo 12: Water and sand play engages all children. It is an opportunity for group play and disabled children can benefit from the motor and sensory opportunities it involves. (Heseltine and Holborn)

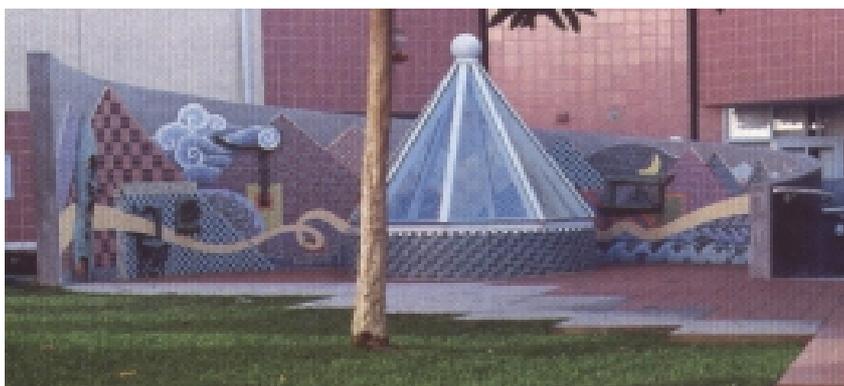


Photo 13: Greens and blues used for this area at the San Diego's Children Hospital. (Sutro, 1995)

#### 2.4.4 Location of the area

The best exposure for an outdoor area is the Southwest. This allows more use of the outdoor space in the cool early spring and late autumn and enables winter use on warm days. Deeply shaded, dark areas are not attractive and because of the low illumination do not function well as activity places. On the other hand an area that is overexposed to sun is not favourable, as children have sensitive skin that can easily be damaged, and medication can make things worse. For this reason there should be a variety of sunny and shady areas for someone to choose from. Filtered lattice works best at many latitudes. Shade provision can duplicate as shelter from precipitation, maximising its use over rainy periods of time. (Vanderbitt, 1999)

The most desirable location for the paediatric facility is to be situated entirely on the ground floor, having big windows and with a covered "porch" area connecting the interior to the outdoor play area. This urges children to go outdoors, while they can be easily overseen from inside. If urban density precludes this arrangement, the paediatric unit might be located next to a rooftop play area. Such a space has inherent limitations, particularly wind problems, however, if this is the only way to have the outdoor space open directly from the unit, it is preferable to a play area in a remote location. (Francis and Paine, 1990)

Entrances should be child-friendly. Children, first-time users, should feel at home and welcomed into the garden with some friendly gestures, such as sculptures, benches, playful archways, or colourful planting.

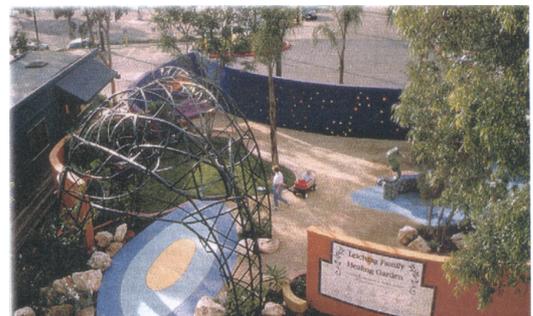


Photo 15: The dinosaur entrance at the Leichtag Healing Gardens (Whitehouse and Marcus)

The act of going out of the door is often the greatest barrier. If there is no possibility of having the building at the same level with the garden then a combination of ramps and steps should be provided. Ramps are good for wheelchairs, but for many abulant



Photo 14: A colourful bench at the Leichtag Healing Gardens. Due to the climate, a parasol is attached to it to provide shade from the direction needed at each particular moment. (Barnes, Marcus, 1999)

people, especially those with walking aids as zimmer frames, ramps are more difficult to negotiate than steps, and can be a real hazard when wet. (Stoneham and Thoday, 1994) Manoeuvring space around the door is essential, as patients new to a wheelchair or gurney cannot independently manoeuvre up a ramp. (Stoneham, 1990).

#### **2.4.5 Selection of materials, possibilities and constrains.**

Automatically opening doors provide the easiest access, as any patient can use them. There are few difficulties co-ordinating accessory medical equipment attached to the patient while going through it. However staff may worry about children wandering outdoors unsupervised. Sliding glass doors (assuming there is no threshold) is the second easiest door for patients to use, as no pushing or bracing is required. It also provides maximum visibility to the space. On the contrary a push-bar door is heavy and requires pushing and bracing, rendering patients in a weakened condition or in wheelchairs unable to use them unassisted, while co-ordinating medical equipment attached to the patient is extremely difficult. (Francis and Paine, 1990)

Plant selection can provide colour variation and collective year-round performance from early spring to late fall. Other key criteria for selection is the sensory variety (fragrance, texture, wind effects), play value (fruits/nuts, seeds, foliage that can be used as play props, places to hide), "nature's bounty" (edible fruits/nuts, herbs), shade qualities, screening (visual buffers and wind screens), wildlife habitat value (birds and butterflies in particular). Though, for their selection one should take into account their general hardiness, the issue of toxicity, their attraction to bees and possible allergic reactions caused by them due to the nature of the plant itself (wind-pollinated plants are more prone) or as a side effect of medication. (Val, 1994; ILAM, 1992; Nelson, 1992)

If parts of a garden are to be used for energetic games - vehicle-trundling or pedal pushing - these areas are best fringed by robust shrubs that are tough enough to survive some inevitable damage, but don't in themselves pose any possible dangers (leaves with sharp edges, thorns). A lawn area should be installed where feasible. It is a powerful visual image, a tactile antidote to the antiseptic hospital atmosphere and a versatile surface for children, parents, visitors, and staff to see, play or sit on. (Stevens, 1995)

Tough lawn can be used for energetic games, but grass is not acceptable as an Impact Absorbing Surface as it is affected by climatic conditions, (e.g. a dry summer or freezing winter), intensive use or significant stone content of the soil. It is quickly eroded, losing its surface covering and root growth, reducing its impact absorbency. For this reason Loose Fill Materials (tree bark, sand, pea shingle and wood chip) or synthetic surfaces are used under climbing equipment and other areas where children might fall from a substantial height. Synthetic surfaces are recommended as they are more effective and permanent than loose-fill and have less maintenance requirements, but they are initially more expensive. All surfacing areas as well as play equipment must meet the appropriate standards of safety. (Heseltine and Holborn, 1987)

In wheeled toy areas, as well as pathways, concrete, macadam or similar firmly bound surface can be used. Paving with deep grooves, heavy aggregates, or large joints such as mortared stone or large aggregate concrete blocks should be avoided, as they are problematical for people using wheelchairs, gurneys, walkers, or attached medical equipment such as IV units. (Anderson, 1990) All surfaces must be free draining, non slippery, and be wide enough to accommodate two way wheelchair traffic. Pathways can have strongly delineated edges, with surface that does not produce glare to facilitate movement by children with sight disabilities. (Twaites, 1994; Puddefoot, 1996) Tapping rails are useful for people with sticks, in places where there would otherwise be no means of defining the path edge. Different surfaces can reveal different purposes, with contrasting surfacing textures signifying the position of particular interesting features or immediate changes in direction. Textures are particularly useful indicators to those with visual impairment, but they can create difficulties for wheelchair users, if their use is taken to extremes. (Thoday and Stoneham, 1996)

In a physical rehabilitation setting, assessment of the disabled patient's ability to cope with ordinary activities of outdoor daily life needs to be undertaken in as realistic an environment as possible. In many instances therapists need features without adaptation to include everyday hazards, such as loose surfaces and changes in level, for assessment and training of patients returning to normal living. (NHS Estates 1991b, 1992) The second category of paths can be set out deliberately to include everyday hazards, such as loose surfaces and changes in level. These should be clearly separate alternatives to the main circulation routes, so that only those people wishing to face the

challenges they present need to venture them.(Thoday, 1982) Large areas containing established mature plantings could easily be provided with secondary routes actually passing directly through undergrowth on unmade paths. These need not conform to the general rules laid out above (besides that all branches and other material that overhang any path should be cleared to a height of at least 2800mm) and can provide a degree of challenge for users, with the opportunity to have more intimate contact with a natural environment.

Path routes should ideally avoid gradients that are steeper than 1 in 20. Any slopes or changes in ground levels may create access difficulties or necessitate expensive groundwork. Incorporating challenging areas or exaggerating existing topographical contrasts provide changes in level that can create discrete individual areas within the garden. They can be used

to create a play mound, which provides a wealth of opportunity for children's play, as it can be crawled up, climbed up, rolled down, interrupt normal sight lines while from the top a child can see familiar things from a different angle.



Photo 16: The mound of the Therapeutic Garden in Massachusetts. (ASLA Award, 1997)

Areas should be provided for wheelchairs or gurneys to be parked out of the circulation path, next to seated friends or playing children. Seats should be positioned in recesses, with the front seat edge at least 600mm away from the main pedestrian flow and 600mm width allowed for each seating position. There should also be at least one 900mm wide free space left at the side of the seat to accommodate a wheelchair user and allow them to draw up next to and in line with the seat.

For children on gurneys or wheelchairs, sand and water play, gardening opportunities need to be provided at an appropriate height. Raised beds can be used to position the more compact species at a level where they can be appreciated without too much effort. Climbing structures or tree houses can be designed to be accessible by children of differing abilities by ropes, ladders, or ramps. There are modifications to existing play equipment to cater

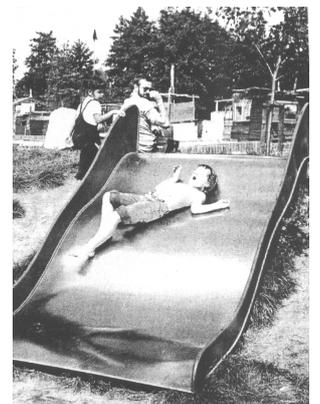


Photo 17: Adapted slide for disabled children. (Heseltine and Holborn)

for the specific needs. Adapted slides generally have wider chutes and ramped access, while roundabouts can be modified to carry a wheelchair. (Heseltine and Holborn, 1987)

Sometimes small things are the ones that make a space usable. Nearby storage place for example. Lack of such a storage area can make virtually impossible to perform therapeutic activities outdoors. Movable chairs, small tools, play equipment; decorations, maintenance tools, or therapy equipment take up space, get destroyed if left unprotected outside and is very inconvenient to move them long distances. Signage should consider that some children are preliterate; iconographic rather than verbal signs would rather be used. Handrails to support weakened and recovering patients that have limited strength can be used more easily if they are provided at the right height (see Appendix 1). Toilets, drinking water, emergency phone and electrical outlets to provide for medical equipment as well as outdoor activities are things overlooked many times, but they are the ones that make a space user-friendly.

Last comes the most difficult part of a hospital garden, maintenance. Its problem is that usually it comes under no-one's responsibility. The handling of hospital land is the responsibility of the estates department. However, with a few notable exceptions, most estate officers lack any awareness or knowledge of what landscape is. The initial budget is often minimal and the maintenance of soft landscape features is usually the area to suffer. One should consider the abilities and restraints before starting to assert what can happen where, and maybe provide a design that can easily be transformed into a low maintenance project; besides, few are always better than none. (Avon wildlife, 1988; Brookes, 1990)

One way of having the best results, with the minimum cost, is to design exactly what the users want. In that way it is probable that it will be looked after and no expenses will be thrown away without a reason. Consulting might have the same formula with the following chapter.

### 3. SURVEY INFORMATION

#### 3.1 Landscape Architects

The first surveyed group to be examined is the landscape architects. This category was chosen since they are the ones responsible to design the outdoor grounds of hospitals.



Photo 18 and 19: No reasons needed to explain why the opinion of landscape architects was considered valuable. The two photographs explain it clearly. They depict the courtyard of Leeds Royal Infirmary before and after it was designed and constructed by the Landscape Company of Anthony Walker and Partners. The company had in mind to "transform an inviting and inaccessible courtyard into a vibrant, diverse space for the use of staff and patients." (Courtesy of Anthony Walker and Partners)

The purpose of this survey was to see if there are some set principles that most of them would use in order to design an outdoor area for physically disabled children in a hospital. Also if these principles are altered through experience. Finally if what they think as priorities and would use as design tools for the grounds conform with what the users (hospital staff and children) want.

As a survey medium a questionnaire was used. The first questions were trying to figure out the previous experience of the interviewee. The following set were aiming to discover the priorities that the landscape architect has in mind, and what he/she thinks are the possible elements to use for the design. The final question is asked so as to find if the landscape architects would consult somebody for the design and which ones he would.

The questionnaire was sent to one hundred registered landscape architects or landscape offices via e-mail. From them thirty-five replied. Two just specified that they have never been involved in designing for hospitals, and for that reason did not feel they were able to answer, maybe it is so for many of the people who did not reply. The greatest percentage (78%) of the people who answered the questionnaire had been involved in the past in designing an outdoor area for disabled people. Three persons have answered that they were not directly asked to do so, but anyway, they always take provision for disabled people in any scheme that they create. The same percentage (20%) replied that they have never been asked to design a hospital yard. These questions were asked to see if there were differences between experienced and inexperienced landscape architects, in the way they would design and interpret their answers accordingly. But as their answers were not different from those of the practitioners experienced in hospitals or areas especially designed for disabled people, this parameter (having specific experience or not) was not taken into consideration.

The decision of the need for the provision of area for children in hospitals was unanimous, with the exception of Sophia Godber who discriminated acute dying clinics, where she thought was not a setting for children. Besides her, also landscape architects from the Heather Godsmark partnership, as well as Nick Rowson felt that children should not be mixed with adults, since adults can be very stressed, while children tend to get noisy, and consequently a space should be provided so as not to disturb other areas. Nobody discriminated whether the area should be for children staying in the hospital, outpatients or just for visitors. They thought that the space should amalgamate everyone and become a place for socializing. Twenty-seven out of thirty-three have pointed out that special provision should be taken for physically disabled children. It was also stated that this does not mean having a special area for them, but integrating them and boost their socialization by creating a space that will think of their particularities but be for everyone.

There was a primary concern about the access to and within the spaces. Ramps were often mentioned and place for children to park their wheelchairs. Peter Veitch also pointed out the necessity of steps and different levels for training outside, to make a space that is physically improving as David Wilson and Rathbone partners stated. Many noted that the provision for access, as well as most of the other decisions, will be influenced by whether the space will serve, for example, a general hospital or serve specific types of disabilities and if so, what special provisions this disability will need.

Safety was the next biggest concern. It should be an area for the children to be free from restrains, and for that, as Citrine Associates stated, it must give them a sense of security, a sense that they are

contained in a safe place where nothing bad can happen to them, instead have a feeling of optimism and uplift (Santa Strudley). For the same reason it was pointed that supervision must be facilitated and as Peter Veitch replied in a way that staff can keep an eye on them while children will not feel that they are constantly on view.

Sensory stimulation was the next priority in the garden. As David Wilson stated it should be an emotionally uplifting space with lots of colours, variety of materials and textures chosen to give an extra-sensory stimulation. And Plincke Landscape company highlighted the extra- because many of the children are affected by their disabilities and they need more stimulation than usual.

One of the things bothering the landscape architects a lot was maintenance. They would never use something that would ask for much maintenance. For example many of them answered as Anthony Walker did, that "provision for pets would be nice, but impractical. Just like the greenhouse, too ambitious, too much maintenance. A small thing would be better, like birdtables." Also Citrine associates found that a grassed area would be difficult to have, as frequent maintenance is required. Instead they suggested nature and treasure trails and storyboards. Colvin and Moggridge were bothered only with one factor; the area to be beautiful also when it is raining and everybody is inside. However, another option for that problem was given by Simon Lisney: a covered area with imaginative lighting to extend use during winter and night.

As it was mentioned above, almost everyone chose the areas to be passive together with active. This is depicted also by their two most referred elements for the area. The one is an area with tables and benches as a meeting place for parents to stay there when they take their children out Or for children to meet and play with friends, especially when there is a child not mobile enough. The next component is a totally active one, a playground. Designed sensitively for disabled children (Citrine associates) and always incorporating a sandpit (Terry Anderson). The next option was a grassed area for as Heather Godsmark partners visualized "a herb lawn or other grassed area to roll on or sit there and play or watch friends".

A water feature was depicted as a favorite one, but many did not choose it for it needs constant supervision. For the ones that did picked it, they stated that it "should never be a pond but a fountain splashing on to gravel/stones used also for acoustic interest" (Keith Muttay), or "for splashing hands in the water" (Heather Godsmark partners). Nick Rowson also asked for fiber optic displays and water bubble tubes with lighting displays in it. Half of the ones that wanted a fountain used it in a

way like an interactive water sculpture. But interactive sculptures in general were very highly appreciated in general, as in a form of sound sculptures (Catherine Bailey) or as play equipment.

Peter Veitch was also concerned about the scale of the place. He considers the hospital to have a big, institutional scale. It must be broken down to the small, child scale so as to make them feel comfortable. One should keep in mind this scale even to the minute details, as for example for the handrails that need to be lower for the child to use them comfortably.

But before designing such an area all the landscape architects replied that they would like to consult people involved. These would probably be the clients, the maintenance workers, social services or planners. One felt that the most suitable to consult would be the teachers. But the occupational therapists and physiotherapists would be involved in the highest frequency, as almost everybody felt that they would be the most suitable for the job. Half the landscape architects replied that children together with play therapists should be also consulted.

The fact that the next groups that were interviewed for this dissertation were the "top three" of the landscape consultants' list, was not mere chance. Although these results came after, they coincide completely with the interviewee list for this dissertation. Personally I started interviewing doctors and hospital directors (two choices not mentioned much by the landscape architects). But after interviewing one pediatrician, a pediatric orthopedic and one director, and after being introduced with unfamiliar terminology and medical information that I have not yet been able to comprehend its practicality to the landscape profession, I was recommended by them to head towards the nursing staff, physiotherapists and occupational therapists. The result of their interview is given at the following chapter.

### **3.2 Hospital staff**

For the nurses and the occupational therapists unstructured personal interviews were used. The first interviewees were discovered by word-of-mouth recommendations, from friends and my tutor; then the one interviewee was recommending another. The interviews were conducted at the hospital or day care centre that these people were working. This was done in order for the interviewer to have a better image of the reality of what these hospitals look like, what kind of external areas they have, how they are used. But most of all, the space was functioning as a reference point during the interview, making easier to explain materials and equipment without using terminology and helping the interviewees explain what they usually do outside and what they would like or not like to have there. There was a set of questions that all of them were asked, but besides that it was found more productive to have a loose, thorough conversation.

On the contrary questionnaires were used for the paediatric physiotherapists. That way was chosen due to the shortage of time, which made impossible to interview all the groups involved. The questions were the similar with the ones asked in the interviews. Their purpose was to find out if the external spaces are used, how they look like, if people are contented with what they have, what they would like to have, how they would use them and if they think it is important for the children to have their treatment and free time outside. The questionnaire was sent to eleven pediatric physiotherapists, recommended by the pediatric physiotherapy director of the R.V.I. Hospital of Newcastle, as the most suitable people to be asked for physical disabilities. Most of them were directors of clinics in different cities.

Remarkably, there was no variance among the answers of the disparate professions. Everybody admitted that sessions are better when they are done in the garden cause it is a more relaxing, free space. As a start, they use the external environment to ameliorate the psychological situation that the child is in. Just the act of going out of the ward is very therapeutic [Pam Dobinson, physiotherapist]. Sheila Kendal (Occupational therapist) characterised hospitals as scary places. All admitted that children change a lot when out, mood changes even if they are on their beds and pushed in a yard. Gale Kale (Play therapists) said a case of a bedridden child: "she was totally depressed and was not speaking a lot. Then one a nice day we took her outside and we gave her an umbrella. She was doing nothing else than smiling and holding the umbrella for more than three hours. It was such a nice change for her, and change is something children need

desperately". As Brenda Sheel (physiotherapist) notes when outside children feel they are out of the hospital. Outside they have natural interaction, play with peers and have more fun, take up gardening, observe people passing, or can have water play and painting.

But besides children also the staff would like to have an area to stay out. In that way also the nurses might be induced to take the children out. One of the findings of this research was that nurses were reluctant to let the children out, as this entails them having more responsibilities. The occupational therapists, the physiotherapists and the play therapists are the ones that take the children out. Usually they have a one to one session with the child, or work in groups, having the same activity for all of them. Nurses have their work always inside the hospital and need to take care of many children simultaneously, to keep an eye also on the outdoors is an extra heavy burden for them. As Matthew Henderson (nurse) said,

" Kids like everything dangerous. The biggest thing is safety. Children to go out ought to be highly supervised". For that reason doors to outside are kept locked after three o'clock, when only the nurses stay in the hospitals. However, all the nurses asked would like to have a nice garden



area to stay during their break times. Being there would of course mean that there could be an unconscious surveillance of the children, providing for more time available for children to be out of the ward. For example, at the Collingwood Court of St Nicolas Hospital, Newcastle its garden is used as a selling point, but not for patients, for the probable staff as an extra point provided to them.

Photo 20: The garden of the Collingwood court; A relaxing place with lots of plants with sensory value as colour and fragrance. Staff that work there like to spend all their free time outside with the patients. Other parts of the garden contain the sandpit, the bubble fountain and tables with chairs for socialising. Though this is the staff's favourite.

Parents also want to go out. They can spend 6-7 months in there, so they need a nice, relaxed area away from the ward situation and work with children in a relaxed way. Leo Jackson (nurse) proposed that a patio next to the ward, for parents to stay there and let the children on a playground would be the best solution. Caroline Fargett (Play therapist) noted that children get a lot quicker when parents are with them. Also there is a huge benefit for the family as a unit. Brothers and sisters are not left out; dynamics of family not only focused on the sick child. For that reason Kendal would like to see a quiet corner in the garden to gather the family. The

problem with the brothers and sisters is also pinpointed by Kale who said: "We lose a lot of things, and many others are found broken every morning when I come back. Usually brothers and sisters create the problem, probably they want to attract parent's attention that is devoted to the sick child".



Photo 21: Children like to play in this playground at the Newcastle General Hospital. But this playground has no access for disabled children, which have to stay away from the other children playing. Furthermore the area is not at all inviting to the neither nurses nor parents. "The area outside is boring. It is not used as much as it should." [Fargett]. Kale was not also happy with the fact that sawdust is not easily cleaned, while it is scattered throughout the place.

A playground can also be used for the children to be together with their brothers and sisters. It is nice to have an empty space for group activities, to take thing out, as their bicycles, which they all love, toddlers and older. Play-area is good because it encourages one to do things with other children. According to Christine Rufferty (Directing nurse) children are supportive to each other, they help each other to overcome their problems and prefer to have activities together.

The play therapists would like the playground to be adjusted to disabled children's needs. The preference for climbing equipment, swings and multipurpose settings was unanimous. Everything should be "Easily reparable, safe for them to stay out and have numerous functions." [Fargett] Swings used are adjusted, with proper seats that disabled children can be tied onto them. Also the cycle are specially designed. But this brings the biggest problem according to Fargett and Erin Michaletou (Occupational therapists) of the hospital yards, lack of storage. As Kale says "These bicycles are so big, they need storage place outside. Two bicycles donated to the Newcastle General Hospital were never used because there was no space for them. Storage is our biggest problem." The next biggest problem, especially according to Alex Thompson (physiotherapist) is that such areas can be used only during summer. For that reason Janice Boshier (physiotherapist) suggests that space should be covered, so as to use them throughout the year.

Another thing of most concern for the play therapists was the surfaces. Physiotherapists, like Sheel prefer soft areas; she believes that uneven surfaces of grass are one of the "musts" that a hospital garden should have to help enhance the mobility training of children. Also Kale said "I favour

having children down on the earth. For children to sit in the sand is much better than having it recessed". Like the Collingwood court were with John Gardner (Occupational therapists) they were making sand castles with the plant pots. They wanted more hard surface for the cars and bicycles, and "Spongy tarmac" (synthetic impact absorbing surface). " We have sawdust under equipment, create lots of problems; it attracts litter and you cannot see them to clean, they get spread to the surrounding area, every time the children have lots of it in their pockets when we finish playing". But also the nursing staff demands it. "Climbing can cause high damage from falls. Spongy tarmac would be the best, but it's very expensive."

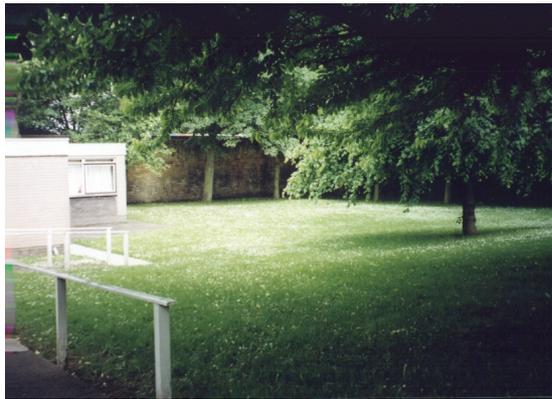


Photo 22: The Welford centre, Gosforth, has in its backyard this grassed, sloping area for team games, informal congregations or private tumbling on the grass.



Photo 23: On the other hand, for the same reasons Collingwood court has this sandpit below.

And play equipment are not only a pastime. Boshier says "Children love to play outdoors, they become more determined to try out new activities, will work greater distances etc." Climbing helps motor skills, climbing frame and slide, test manual dexterity, having to use steps is a good test for Thompson. Play can be used for pre-discharge planning, as a trial to go home instead of a gym situation. Outside is much more relaxing from a physical point of view because, as Kendal explained, inside buildings the carbon dioxide gets accumulated, therefore children are easily fatigued. It is psychologically better because Constantine Velikos (Occupational therapist). "Play is a very important treatment, it builds confidence. Some kids are frightened from failure, but they cannot fail in play. The relationship between the nurse and the child through play is beneficial, as one can find what makes them happy, sad, what they can manage to do and what not, see what they are responding to. They can be creative, be praised, get reinforcement for their effort, be confident, and gain positive experience. "

According to Dobison the child needs to be challenged through his environment. For Velikos sensory gardens should be constructed to provide stimulation with light and lots of bright, clean colours, and for Michaletou hovering objects for sensory arousal and topiary art to stimulate the imagination. Also soft coloured surfaces to lie on, smells, fragrant plants, lots of thing to feel and look at are suggested by Michaletou. Another suggestion for creating a more interesting environment was by Maria Nataki (child-psychologist), to have children standing on the wall in different poses and then depict them to make them feel the area is theirs.



Photo 24: Raised planters that are cultivated by children at the John Marly's centre, Fenhom. It is a nice environment that children like to be in and help in its establishment and enhancement. This garden teaches the children basic principles of permaculture. It is full of colourful plants with lots of flowers and butterflies visiting them.

To stimulate them the environment ought to change for children that stay for a long time. For them horticultural activities are much recommended by occupational therapists like Kendal and Fargett and by physiotherapists like Pam Clemers. According to them, working with plants is therapeutic. It is calming to see them grow and change, also it is nice to have responsibility over something, be in charge of watering or cutting the flowers and arranging them in the ward. They can gain skills from working with plants, like working with both hands for children that have problems using their one hand, or for ones in wheelchairs to take care of plants not only in raised beds, but on ground level by using adapted long garden tools. Velikos and Marc Perry (horticultural therapist) would like to have a greenhouse or a covered area next to hospital that could used for horticultural therapy, not only for long-stay children, but also for short-stay ones. For them they would prefer growing sunflowers and bulbs on pots, that can grow fast. Or create a feature with willow branches as in the John Marley Centre, Fenham where children have woven it in the shape of a dragon and use it as play equipment, also having story telling inside it.



Photo 25: The entrance of the willow dragon at the John Marly's centre.



Photo 26: The lake at the John Marly's centre. Children love pond dipping in the waters. For safety reasons children are always supervised when the garden is open.

Woodland is not considered essential "but it nice, different to have; a good distraction for kids", for Jackson. For Henderson "Wildlife is nice to have, but problem with maintenance and space, too much effort." There is the simplest solution, "Nesting boxes, bird-tables, butterflies can lighten up the day" [Perry]. According to Rufferty "all children love animals, all kinds of them. We have a wormery". But what are the children's favorite? According to Rufferty and Ian Forbes (horticultural therapist) it's "pond dipping". To take bottles with creatures from the lake and watch them. A pond is a nice feature for a hospital, but most of the people think it is a highly dangerous one. Kendal believes that a grid on top can make it totally safe, but not all have the same attitude. Usually a bubble fountain is welcomed as a stimulating feature, but nothing more.



Paddling pools are much used by play therapists like Kale and Kendal but it always has to be one to one with the child. Usually they are not permanent features, but inflatable plastic pools that are taken out from the storage when the weather is good.

Photo 27: The wildlife garden at St Nicolas hospice, Gosforth. It has this natural trail, a pond with minute life and ducks and some wooden features. Children like to go there and see the birds, the butterflies and the other animals that are abundant there.

Besides safety the other headache that has to do with hospital outdoor areas is the funding for their creation and their maintenance. Dobison considered money restriction as the primary difficulty for hospital yards. First of all as Sylvia Mason (Occupational therapist) highlighted, general managers and middle-ranged managers think that gardens are not a necessity. When it is planned

to be created the "next problem is that it's usually year's funding". Brian Hunter (Estates manager) specified that Art has a percentage of 1% per total expenditure for every new project of the hospital, which can incorporate architecture or landscape architecture. But after that there is no special funding for maintenance, the department has to make the appropriate apportionment. To sustain the garden is usually the personal effort of the occupational therapists, as Gardner said. The good thing is that once a play scheme or a garden is established on a ward, the hospital is usually reluctant to give it up as its advantages are visibly demonstrated. And from there on much is given through donations. For the example of the Collin Court there are people giving plants from their gardens [Gardner], or donating equipment [Kale] or money to buy them [Rufferty]. Much of the maintenance and supervision to other departments is through using volunteers. But it is not much helpful for paediatric units as Fargett explains "children are not worthy taking the risk, need police checks to be sure that no problem will be created by them.' Children are valuable; so is their opinion. That is the reason why the next set of interviews focuses on them.

### **3.3 Children**

The last group that was interviewed for the purposes of this dissertation was composed of fifteen children. The scope of their interviews was to find out which outdoor environments they prefer and what they would like to do when they are there. Three of the children were met at the Ward 26 of the Newcastle General Hospital. The other twelve were interviewed during three visits at the General Hospital and Ippocrateio Hospital of Thessaloniki. The children were aged from six until twelve and were all in-patients. Unfortunately it was not possible to find at the time of the visits children with physical disabilities. Since time was limited and questions asked were about children likes and dislikes, which do not change particularly when a child is hospitalized for a broken arm or an appendix operation, youngsters were interviewed indiscriminately why they were hospitalized for.

They were privately interviewed. As an interview tool, four sets of photographs were shown to them. All the pictures were taken from existing hospital grounds. Every photograph was explained to each child, what they were showing, where it was taken from and how the things in the photographs were functioning. Then there was a discussion about which things he or she liked more, whether a combination between the different photographs would suit his/her preferences more than the groups that they were already been arranged. Then the children were asked to express themselves freely about how they imagine themselves using the places, what they would like to do there and with whom. Another question asked was which setting he/she believed would

be better in an area that he would use for a long of time and on the other hand which ones would be more interesting to have in a place that he was visiting rarely. Afterwards they were questioned that if they had a friend with a broken arm, or had to use walking aids, which one would be the place that they would prefer to take him or her in order to play together and make him feel better.



Photo 29-31: Different playgrounds with various play equipment, used as examples for the children's interviews.

The first set of photographs was comprised of four different playgrounds. Seven out of fifteen children chose for their favorite the playground group. They explained their choice saying that this setting provide the best playing environment. "It's a kids world. The other ones look for grown-ups", said John. "This is the place I 'd like to go with my friends, looks like the ones I go to play near my house", said Mary. These photographs seemed particularly familiar to all the kids, an environment that feels like the one they are used to being in, with prospering promises for playing and meeting friends. In general most of the children preferred to have familiar places -even if it was a place that they would visit once a year- and a place that would cry out loud that it's a children's area.

The photograph with the snail-shaped slide intrigued the interest of two of the children. They asked me to explain exactly from what materials it is made and where it is positioned. But although interesting, they both came to prefer the other photographs. The one said for the slide; "Too pretty, but it feels lonely not to have other things near it". Besides these two, most of the children were fonder of the multi-use equipment. They usually asked for equipment that have lots

of things in one place, to be able to climb from one point and go down from another, to pass from one piece of equipment to the next without stepping on the ground.



Photo 32-35: The four photographs used as reference points for hospital planted areas. There were two examples of plant compositions full of colours and textures, one raised and one on ground level, a grassed slope and a woodland path.

Five children from the fifteen were in favor of the planted spaces. Children that liked these places were especially fond of the woodland path and the grassed area. To them the need to hide behind the woodland, lie on the grass and watch the leaves shivering from the wind, or hop from the one flower to the next, was the best way to take the mind out of the hospital. Tom and Dimitra had also an argument against playgrounds. "I choose these places even now that I can move freely. But if I had a friend that was sick, then to be in the playground with other kids running and doing things, would make him feel worse. I think that it is better to take him to the woods, to run away from nurses." Eight children were fascinated with the idea of finding wildlife inside the woods; going to

feed the birds was considered a nice occupation for them.

The two photographs of this group showing a planted raised bed and an area planted with scented and flowering plants were not highly responsive to the children. Although they liked the idea of having flowers and fragrance around them they would prefer it in a more natural setting. Especially George, who voted for playgrounds, was totally against it: "These ones are too institutional. Good for the hospital, will look more pretty than what it is now, but it is not what I would like to have when I go out, it reminds me that I am sick." Here it must be emphasized that these particular photographs were very appealing to the grown-up's eye; in Collingwood court this garden is the favorite place of the staff and visitors of the St Nicolas Hospital. Youngsters though see only a minute potential to them, no place to hide, or kick a ball. Though, it should be pointed that none of the hospitals that these children were staying in had horticultural therapy programs. Maybe if there were any, children would see in those two photographs the potential to take care of plants, get involved with them, rather than think of them as passive, institutional plant beds.



Photo 36-39: The next set of photographs shown to children, depicting a bubble fountain, two sand play areas and a natural pond.

The next set was composed of a bubble fountain; the pond used in John Marly's centre for "pond-dipping" and two photographs of sand play areas from St Nicolas hospice. Children were asked if they would like to have a water feature in the hospital, if they like to have the opportunity to play with water and what kind of water-play. All of them would like to play with water, as much as

with sand. The sensation of plunging ones fingers in water in a hot day, wetting others for fun, or watching fish swimming in a small pond were all mentioned by them.

However, most of the things they would like to have like big fountains to climb or fishponds, are very hard to build in a hospital, for safety reasons. The bubble fountain is a subsidence allowed in hospitals, but youngsters are not really fond of it. George asked about its usage than he added: "I like fountains only if I can play with the water or dive into them. This one does not look right to me, it seems useless". Also the pond had no special appeal to them. David explained "It is closed with these things. I want to feel free to go inside or play by the pond's shore. If it just for looking from a distance it is better not to have it." Three others said about the same thing. The fact that the pond was enclosed for safety reasons, was a frustrating factor to them. They did not like the fact of being barred from doing something; going out was a synonym of having freedom for them, not remind them that they are confined in a hospital.

Half of the children pointed the sand areas as a thing they would like to have outside. Nevertheless, they would rather have them in combination with other things- in the corner of the playground or before entering in the woodland, not alone. When asked if they prefer a recessed sand pit rather than a sunken one, most of them replied that they would like more to be able to lie on the sand or on the wooden deck or path shown on the photograph and play from there. Aris I particular said: " I want a place like staying on the beach, to be able to lie down and play with my buckets, pretend that I am on vacations by the seaside. If you put it like a table than it will not have so much fun."



Photo 40, 41: A fox painted inside the wooden stakes. Other animal features are also dissected on different trunks and scattered around the place, but when one looked from a specific point they were composing the integrated image. These two photographs were also shown to children

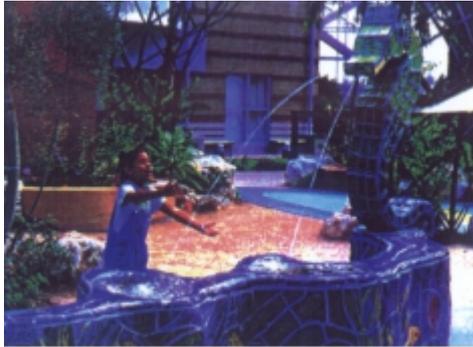


Photo 42-44: The other three photographs used for the children interviews. They were composing the set that was showing an environment full of colour and architectural features that children can play with.

The final set was showing different elements that children could play with. It was composed of the sea-horse fountain that they can play with the water, the wall with the interactive sculptures and the animals wall that a child can hide behind and watch the comings and goings of the rest of the garden. There were also two photographs depicting a setting of wooden stakes hiding inside painted animal features. These features were dissected on different trunks and scattered around the place, but when one looked from a specific point they were composing the integrated image. All photographs had in common their vivid colours and their promise for an extraordinary, children's environment.

Half of the children were very attracted by these photographs. But although they were saying that they like them, at the same time they were stating that they would much more prefer to have an ordinary playground or a planted area. They would like to have a fountain like the seahorse or pictures like the fox one dissected on trunks, but only in conjunction with other major elements. Not have these ones as principle components. Four children were very impressed by the colours of the tiled wall, which "were very soft and calming" [Nick] and liked the idea of having sculptures like the huge phone that one can speak to and hear the voice coming from the other end of the wall. Seven kids agreed that these would be interesting features to explore in case they would not had to stay for a long at the hospital. Alex proposed "They must put something like that for children that come for visits. I would like to have something different to show to my friends when they come, to out and explore what we can do with these odd stuff. But for me personally, I want

swings and climbing nets." Like him, most of the others also concluded that it would be really boring to spend the time outside only with having such occupations as trying to find the location from where they can see the whole picture or spin the huge wheel at the interactive wall.

Also four children chose these features when they were asked what kind of environment they would choose for a disabled friend. These settings, together with the woodland and grassland that was the choice for this question of other five children, were seen as best, with the explanation that they are calm, have easy access to everyone and do not need effort to play with, unlike the playground. On the contrary the others answered like Daphne "I think that my friend would like to have the same environment with the one he likes when he is well. If he likes playgrounds or flowers or ponds I would take him to those places. I will not make him happy if I take him somewhere different because he is ill." Both answers are logical. It is up to the psychology of the disabled child if he or she would like something calm and easily accessible that will not need any physical endeavors, or the fact that usually he does not prefer such environments he will see this as an enforced change that might make him feel more constrained by his disability. Children were fonder of the playground, and the fact that playground equipment can be altered to be used by disabled children, can be a good solution to this problem.

In general, the perfect place would be to have a playground that will also have the facility for water and sand play, together with a grassed area and a woodland giving shelter to wildlife and sometimes themselves. If more things would be available, then interactive sculptures, fountains, coloured tiled walls are more than welcome. But the priority is to have areas that can provide for play activities and quiet places to sit and talk with friends away from other people.

#### **4. Conclusions**

From the previous chapters, one can figure out that there were many identical answers to the questions of this dissertation from the different groups involved in the research, as well as from the literature review. Everybody felt that external spaces contain promising chances of becoming the centre of the healing process in hospitals. They can provide for the recreation of the children, can distract their mind from the hospital environment, as well as provide a cosy place to gather one's family and meet one's friends. On the other hand for those who have some kind of physical disabilities, they can stimulate the use of all faculties, help the process of recovery or readjustment or be used as diagnostic tools.

Besides the general beliefs about what these places can do, there was also agreement about the specific elements that these spaces would be composed of; again there were no differences among the interviewed groups, and the proposals from the literature review. However every group had its different priorities, what they would most like, what they were more concerned about. Children, for example, thought that it was more important to have a playground, with lush woodland and grassed slopes coming second. Opportunity to play and feel free were the major requests. But behind the play opportunities could lie another reason. It might be a fact that they preferred the playground photographs because they were depicting something familiar; it is a connection to their ordinary life, to their neighbourhood. This connection provides a calming effect, makes the environment less hostile, and feels a little more like home. The next element that the children liked, the woodland path and the grassland, was also a tranquil area to be in. They preferred them in order to relax, hide away from the hospital environment and their problems and be in the secure embrace of nature. Furthermore, they did not like anything that had constraints in its usage, any barriers or features that are only for looking at, as much as they did not like the institutional, grown-up's environment. They preferred the space to look like it is for children, not for a hospital. As far as colour in their environment is concerned, in a slight contrast with the literature, they were not so fond of the primary colours, which were thought harsh, but more liked the calm effect of the pastel ones. Opportunities for wildlife were welcomed, but the opportunity for horticultural activities were not so much highly esteemed. Differences between the preferences of boys and girls and between the group ages were not found during the interviews, but a more thorough research might reveal some.

For the hospital staff, the playground was also important. They preferred it in order to have an area for the children to play with friends, but also for their usage in the therapy sessions. Play was noted as the best cure both for the psychology of the child and its physical problems. They other thing that they would like to have was a nice patio outside the ward, for the parents to stay out, but also for them to have their coffee-break or lunch outside in an attractive environment, while being able to keep an eye on the children. Playgrounds were also mentioned as good settings for the children to be with their brothers and sisters. Having spaces to be with their families were considered very important from the hospitals staff, in order to keep a good balance inside the family; activity areas as well as private spaces were mentioned as necessary elements. Children also mentioned private spaces, that was the reason they liked woodland so much, but for them their choice would not be to go with their parents, but with their friends. Children were of course not bothered with practical restrains or safety matters. The hospital staff, as much as the landscape architects, were considering them greatly. Practical aspects that the staff was concerned with were mostly the existence of big surfaced areas, to have impact absorbing surfaces, a big storage place, covered areas for winter, as well as the need for maintenance.

The landscape architects were much like the previous group. For them playground and sitting areas were the major elements. Their concern is for making the place an area that will advance the socialisation of these children through their interaction with peers and grown-ups in a space that would function as a meeting place. This place should not be only for these children, but provide for them and integrate them with other people. For this space they also proposed, together with the occupational therapists and physiotherapists, integration of ramps together with steps and other features to be used for exercising facilities. To them likewise there was a major consideration for safety precautions and again maintenance. Many of the landscape architects also proposed sensory stimulation through plants, the use of lighting displays, the interactive sculptures. Though all these can give a different note to the space, they were not so highly considered either from staff or children; they would like to have them, but only as extras, when the basic common commodities would be provided. Also proposed by the landscape architects, together with some occupational therapists and physiotherapists, was the need to make an area for sensory stimulation of the children through fragrances, colours, textures. However this option was not so highly esteemed by the children interviewed. They preferred fragrant flowers and different textures to occur in a natural setting rather than having a corner with them.

But it should be pinpointed that no physically disabled children were involved, who would probably liked to have such environment around them. This fact is a weak point of this research,

together with the fact that the researcher had no previous experience of interviewing children. Interviewing them, especially six and seven year olds, might need some special skills in order to explain to the child the questions without influencing him or her and then understand the answer that he or she wants to give without distorting its meaning. With them most of the time the answer is hiding behind the answer that they give, and sometimes they cannot give the explanation why they prefer something from another one. Their answer is "just because". For that reason it can be recommended for a further, thorough research to be made, focusing only on the children, dealing with what they would like to have and why they have these preferences. In this research it was not possible to focus more extensively on the children's opinion, as its purpose was to find guidelines that landscape architects might follow in order to design such spaces, together with the preferences of the hospital staff and the children respectively.

According to the combination of these groups, together with the literature research if one was supposed to design such an area, the first thing one should consider installing would be a playground. This playground should have specially built equipment for the disabled children, preferably multi-purpose ones and some opportunities for water or sandplay. The playground should be designed as a child's world through cheerful colours, small scale, cartoon figures. The next element would be a sitting area for the grown-ups as well as for children that want to stay with them. This area should be designed to attract the grown-ups rather than the children. Coloured and scented plants in a year-round setting, a bubble fountain, sculptures, can all make this space more inviting. In this way parents and nurses can be induced to escort the children out. From there the playground should be easily supervised, as well as from inside the building. It would be nice if part of the sitting area with a part of the play area were covered.

The play area should be covered with synthetic impact absorbing surface. There should be a path approaching the equipment to help the children in wheelchairs go near them. An external assessment and therapy area can be provided, with a range of paving and fittings for testing and mastering skills related to walking, stepping, climbing and learning to use walking aids and wheelchairs, in a realistic everyday setting. Paved and grassed areas can be left empty for group games, gatherings, taking paddling pools or as well as riding the special bicycles and cars. If there is enough space, then grassed slopes, a small woodland fringe around one corner can provide for private corners and a sheltering sensation. There, some nests hidden in woodland and some bird-tables can urge some wildlife appear at the hospital yard.

The whole area should inspire children with a feeling of security combined with freedom. Everything contained in that space should be safe and can be used by the children with no "don'ts and but's". Children ought to feel free when they go out, and free to go out. The space would be better if easily accessible to everyone. All childrens' wards should be on the ground floor, with sliding glass doors to the outside. It would be best if the hospital floor would be at the same level with the ground, otherwise spacious ramps will be necessary. For the pavement concrete or other smooth even surfaces would be better used to facilitate the children's movement. To make its use easier, toilet facilities, electricity and tap water can be provided to the outdoor areas. Also, as the hospital staff highlighted, storage area is a necessity for the outdoor space to function. Of course handrails, chairs, tables should also have the children in mind and their measures arranged properly.

These are some principles, but every place has something that discriminates it from the other spaces. Accordingly every design should have something special to say, a story of its own that the children would be spurred to find. One's design will not miraculously cure a child. But it can make him or her feel better, feel more at home, provide a playful setting and make the everyday boring and sometimes painful exercises a game. A child's smile is invaluable and a space that can promote this is the most exceptional place of all, as it provides for the healing of one's soul. And that is the most important factor, as it promotes not the treatment, but the therapy of one's condition.

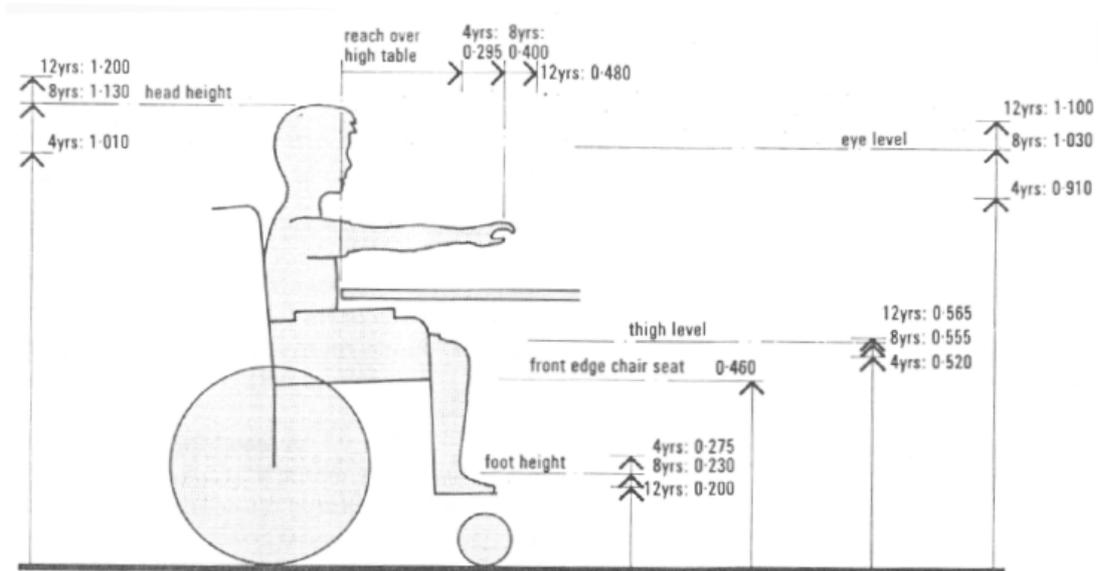
# APPENDICES

Anthropometrics of chairbound boys and girls aged 4,8,12.

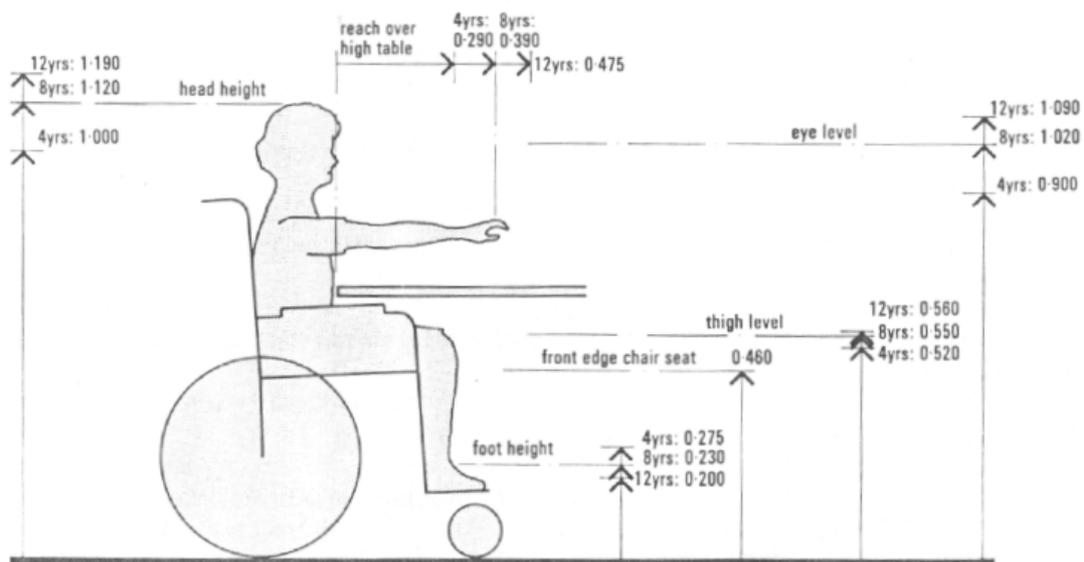
The questionnaire that was sent to the Landscape Architects.

The questionnaire that was sent to the pediatric physiotherapists

Appendix 1: Anthropometrics of chairbound boys and girls aged 4,8,12. (Goldsmith, 1976)



Anthropometrics: Chairbound boys aged 4, 8 and 12



Anthropometrics: Chairbound girls aged 4, 8 and 12

Appendix 2: The questionnaire that was sent to the Landscape Architects.

My name is Maria Gidakou and I am a student in MA Landscape Design in Newcastle University. I am conducting a research as part of my Master's thesis for the university. My research subject is about finding design guidelines for outdoor areas in hospitals for children with physical disabilities. The first part of my research deals with the landscape architects, to find out whether there are some principles that they consider when they design such areas, if they think that they are different from other schemes, what they would probably design if they would undertake one.

I would be more than grateful if you could reply to my questioner and provide me with the basic information I need. It would be of grate help to me, and the research I am conducting. Thank you.

Where you ever asked to design an outdoor space for physically disabled people?

YES

NO

**Have you ever been asked to design a hospital garden?**

YES

NO

**Do you think that in a hospital there should be provision for children areas?**

YES

NO

Do you think that a space for handicapped children in a hospital needs to have particularities in its design?

YES

NO

If yes for what reasons and what would you particularly suggest?

These areas should be 1) active, 2) passive or 3) provide both?

For that space you would most probably suggest four design elements, like:

- A grassed area
- A greenhouse
- A playground
- A water feature
- An area with benches, tables as a meeting place
- Interactive sculptures
- Provision for wildlife or pets
- Sensory stimulation through different textures, colours, planting, objects

Or suggest others

1:

2:

3:

4:

If you were designing such an area you would consult (mark the two most possible):

- The director of the hospital
- Doctors that work in hospitals
- Occupational therapists, physiotherapists
- Play leaders
- Children
- None

Other:

### Appendix 3: The questionnaire that was sent to the pediatric physiotherapists

My name is Maria Gidakou and I am a student in MA Landscape Design in Newcastle University. I am conducting a research as part of my Master's thesis for the university. My research subject is about finding design guidelines for landscaping outdoor areas in hospitals for children with physical disabilities. A substantial part of it deals with the desires of the staff of the hospital, how they would like it to be landscaped and whether they would use an outdoor area as part of the therapy provided, and under which circumstances this could happen.

I would be more than grateful if you could reply to my questioner. The purpose of this particular one is to provide me with the basic information of the physiotherapist's point of view to such areas.

Thank you.

1) Are there outdoor spaces in the hospital/institution that you work? How would you describe them (boring, interesting, shady, useless, empty, etc)?

2) Do you think that a patient should be provided only with scientific, specialized treatment, or his/her treatment should be provided in a more holistic way?

3) Do you believe that a garden can facilitate a person's recovery? Are there any particular circumstances for that to happen?

4) Do you use these spaces as part of your therapeutic/rehabilitation program?

5) Are you satisfied with the outdoors spaces that you are provided with?

6) What would you consider as the best-planned and furnished outdoor space that could be provided to you, so as to be used as part of the treatment of a physically disabled child?

7) What kind of treatments can occur outdoors?

8) Do you see any differences in children's attitudes while they are outdoors? How would you describe their behavior?

9) Do you consider safety or any other reasons to be discriminating against working outdoors?

10) Any more comments that you would like to give upon this subject?

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