

# Creating healing environments: humanistic architecture and therapeutic design

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Humanistic architecture aims to place human welfare at the heart of the art and science of building design and environmental management. In this article we aim to show how humanistic architecture can contribute to public mental health and mental health promotion, using as an example our own architectural and design practice, Nightingale Associates. Nightingale Associates aims to combine psychotherapeutic methods with traditional architectural design to create healing healthcare environments that, evidence shows, can enhance and support the care and treatment process.

## OPINION

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**H**umanistic architecture draws on international research in the fields of psychology and sociology, biology and physiology into the effects of the environment on health (for example, Sommer & Wicker, 1991; Ulrich, 1991a; 1991b; 2001; Zhdanova *et al*, 2001). It is the task of the humanistic architect to translate this research into projects that place the individuals inhabiting particular spaces at the heart of the design process. Architects and designers are rarely trained in methods of design specification that are specific to healing environments. Traditional approaches to architectural and design are therefore of little use if architects are to reflect on how patients' symptoms or behaviour might be affected by the environments they inhabit, or to provide individualised environments that might ameliorate specific health or behaviour problems.

Nightingale Associates (NA) is a leading UK architectural practice and the largest in Europe specialising in healthcare, science and education. The practice offers a fully integrated service, including architectural and interior design, brief writing, strategic and master planning, and landscape design. NA also has a strong research and development department that gathers international data and collaborates on research projects with universities such as Sheffield, Kingston, De Montfort and the Medical Architecture Research Unit at London South Bank University. Our architects actively engage with staff, clinicians and individual patients; our designers research, interview and record

the emotional, physiological and physical symptoms of individual patients in order to create optimal, evidence-based healing environments. This level of interactivity is a substantial departure from traditional practices of healthcare design, and has been implemented on a number of recent projects in the UK such as the Rathgael adolescent regional secure care facility in Bangor, Northern Ireland; West Park mental health hospital, Darlington, and the personality disorder unit at the East London and the City Mental Health Trust Centre for Forensic Mental Health.

NA has also extensively reviewed and participated in international research projects focused on healing environments, and is currently involved in producing guidelines and evidence-based methodologies for NHS Estates on the planning and design of healthcare environments. NHS Estates wishes to gather an evidence base on the therapeutic value of good healthcare environments in order to provide guidance and support to NHS trusts on the design and construction of health premises. The guidelines will translate the evidence into practical advice in order to identify and spread good practice.

Tracing causation of human behaviour is not easy. The line between aggression precipitated by a sense of injustice and aggression precipitated by mental illness is not clear, and nor is the line between malingering and mentally disturbed hostility. Sensory deprivation in penal institutes implies a severe limitation to one or more of the senses. It has been suggested that monotony and boredom caused by enforced idleness, lack of variety

and sensory deprivation, can contribute to vandalism (Kirk & Reid, 2001). Genetic make-up and what life presents to us from birth may determine how the individual responds to their situation (Levine, 1997). Those who develop severe personality disorders as a result of childhood trauma and/or social conditioning can manifest behavioural reactions that our society finds unacceptable, coupled with an inability to develop and maintain rewarding personal relationships (Kirk & Reid, 2001; Lake, 1986). For all these reasons, we believe that therapeutic prison regimes (see Genders & Player, 1995) that focus on enabling those serving criminal sentences to change their perceptions of the world and realise the extent of their difficulties can produce benefits analogous to those gained from therapeutic healing environments.

Nightingale Associates therefore brings psychotherapeutic methods and architecture together in order to respond to the challenges of penal environments as well as to those of healthcare, and has developed three hybrid design tools to devote to this endeavour. These are:

- sense sensitive design
- emotional mapping
- the Design Prescription.

#### **Sense sensitive design**

Sense sensitivity is an essential component of design decision-making, enabling us to understand how and why spaces can become – or indeed do not become – therapeutic for those inhabiting them. Research from a variety of disciplines shows that a range of environmental characteristics can have powerful healing and therapeutic benefits for their users (Ulrich, 1991a; Scher, 1996; Lewy *et al.*, 1980; Murgia & San Martin, 2002). These characteristics include natural light and artificial light, colour, views, art work, aroma, modulation of space and form, arrangement of furniture, manipulation of scale and proportion, sound, texture and materials, movement through space and time, and indoor and outdoor plantscapes.

NA has used this research in the design of healthcare centres and departments and in responding to particular patient groups and individuals (ranging from pre-term babies with jaundice to people with severe mental health difficulties). Research has shown, for example, that post-operative recovery is hastened when patients have access to (real or artificial) views of nature (Ulrich, 2001). Medicine oscillates between attending to the general and to the specific. Unless general attention is given to a patient (such as adequate diet, proper amount of light, heat, and so on), no amount of specific concentration on pharmacognosy (herbal treatments) or pharmacological treatment will bring her back to good health. Humanistic architecture, likewise, sees the promotion of mental well-being as

concerning both the general and specific. Its first task is to consider how the individual perceives the environment through the main sensory receptors and how these data, when relayed to the brain, affect both psychological and physiological processes.

Schonberg (1985) has argued that touch is ten times stronger than verbal or emotional contact. Scientists have discovered that most of the nerve receptors will respond to pressure in addition to their main function. Pain produces irregular beats from the nerves, at jagged intervals; itching produces a fast, regular pattern: heat produces a crescendo as the area heats up (Grigsby & Stevens, 2000). Such details are important when planning a burns unit: through draughts have to be avoided as air movement, slight or otherwise, can cause severe levels of pain to a patient whose skin is exposed. So care has to be taken over the position of doors, windows and air conditioning units. Walls and floors need to be level, and other surfaces should be true and honest to their materials (ie. they should appear as they are, rather than be disguised by artificial finishes), so that patients obtain optimum reassurance in the interior living space. Avoidance of perceptual confusion is important for people who are emotionally distressed: for example, wood-grain finishes on metal doors can lead to confusion because the doors will be unexpectedly heavy and cold to the touch, rather than warm as wood would be. Touch, we argue, plays an important part in the recovery of a patient with mental health problems, helping them re-engage with the materiality of the world surrounding him.

Sounds enhance our sensory perception; those of us with hearing depend on sound to help us communicate with others and express our responses to the world around us. Extensive clinical research shows the beneficial effects of music (eg. Knight & Rickard, 2001). In contrast, sounds perceived as noise have been implicated in increases in heart rate, blood pressure, respiration and even blood cholesterol levels. In penal environments, noise is one of the most persistent problems. Communication becomes difficult, conversations are shouted, sleep is often disturbed, and stress and discomfort are common. There are two main factors to consider: the source of noise, and the use of hard materials (for security fixtures, loud-locking mechanisms, indestructible surfaces etc). Hard materials do not absorb much sound and, we contend, encourage residents to respond in a hostile and aggressive manner. Where residents do not have any control over unwanted noise, they tend to exhibit physiological reactions typically associated with stress.

Designers have a real opportunity to influence mood, perception and motivation through smell and fragrance. Smells can relax muscles and aid concentration; unpleasant odours can increase heart rate. Some of the smells in hospitals – such as formaldehyde, formalin, iodine, glutaraldehyde, bone

dust, urine, burnt skin, hair, testosterone, disease and body odour – can evoke strong emotional responses, such as fear. Good ventilation systems will remove these smells. Kajima, a contracting building firm in Japan, has installed a unique air conditioning system at its headquarters in Tokyo, in association with Shiseido, a perfume manufacturer. The system emits citrus smells that invigorate staff early in the morning, followed by floral smells that aid concentration and woodland smells at lunchtime to relax. The same cycle commences after lunch. Smells have also been used in healthcare environments: ‘baby smells’ have been used, for example, to reduce aggression in hospital A&E units. Pleasant smells help produce endorphins, the body’s natural ‘feel good’ drug, and, it is hypothesised, can reduce the amount of anaesthetic administered during a surgical procedure. Within penal environments, air movement and quality is essential where windows are kept closed and are of minimal dimensions. Zimring, Munyon & Ard (1988) showed that, relative to a no-odour group, the presence of even a moderately offensive smell increased levels of aggression.

The effect of light on our health is critical but our knowledge and understanding of optimal therapeutic requirements remain uneven. More research is required to understand how optimisation of the beneficial effects of artificial light and the maximisation of natural light might contribute to the well-being of patients. What is clear is that more windows can reduce mechanical and electrical interstitial space, and that the process of ducting light and controlling its colour and intensity can influence behaviour. Heliobus, a Swiss lighting company, has developed an elegant sun scoop that ducts light into areas that never see daylight, such as those used for diagnostic imaging. The biodynamic light developed by iGuzzini, Troy University, New York, and Spazio architects in Milan mimics not only night and day but even the effect of passing clouds. Research by Wener and colleagues (Wener, 1990; Wener *et al.*, 1985; 1987) suggests that windows are more than a luxury for the incarcerated and that lack of contact with the outside world heightens stress and depression. In restricted and monotonous situations, a view of the outside world becomes a necessity. The highest stress areas in prisons, isolation cells, are those that most commonly lack windows.

Colour is one of the least expensive healing tools. Colour can enhance light by brightening or subduing spaces, provide sensory stimulation, give directional and other information, and optically change the proportions of a room. Surrounding wall colours should not use actual skin colours since both doctors and anaesthetists judge a patient’s condition through skin tone. Blues have been used in A&E departments since they appear to subdue aggressive individuals. Light-reflecting paint can be used in long, often dark corridors within prisons to maximise internal light. Research has indicated that

visual monotony can contribute to physiological and emotional stress (Kuller, 1981).

### **Emotional mapping**

Emotional mapping enables clinicians and designers to navigate their way through the emotions, feelings, sentiments and sensations of patients in relation to the healthcare environments. Emotional responses vary according to individual patient groups and to settings in hospitals, prisons and mental health units (polytrauma, treatment, A&E, waiting rooms, counselling offices, bereavement rooms, therapy rooms, quiet spaces, day/dining areas, play spaces, multi-faith centres and retail areas etc). Emotional mapping involves identifying patients’ predominant emotions in each space/unit on a set of coloured plans: for example, a polytrauma unit may be coloured red to represent fear, anxiety and terror; a children’s play area may be rendered yellow to reflect happiness; a chapel space might be mauve to reflect a meditative emotion.

For each project, a set of architectural 1:200 scale plans is colour coded according to the emotion aroused by the various rooms, corridors and spaces, with a colour wheel that explains which colour relates to which emotion (introspective, vulnerable, relaxed, anxious, agitated, fearful, hostile, thoughtful and so on). Clearly, some spaces will be associated with a range of emotions, and here a colour spectrum – say, yellow to orange and through to red – will be used, rather than a single colour. This simple, visual key can then be used to inform the application of design and environmental features that will counteract the negative emotions and accentuate the positive. For example, projects in which Nightingale Associates have been involved indicate that different presentations and combinations of blue spectral lighting, temperature control, dimming capability, cool colours, sound-absorbing materials and aroma ventilators can all help mitigate the likelihood of aggressive behaviour in, say, a seclusion room.

### **The Design Prescription**

Doctors most commonly prescribe medication for individual illnesses, conditions or trauma (for example Prozac for depression). They ought also to advise patients on the environmental factors they should avoid in order to assist their treatment and recovery. People with migraine, for example, should avoid noise, bright light, hot ambient temperatures and saturated colours. The Design Prescription aims to define the precise and optimal conditions for the healing process both for healthcare departments and for specific individuals. It has been adopted in many of NA’s projects in settings for patients of varied backgrounds and age groups and suffering from a wide range of disorders (self-harm, depression, schizophrenia, claustrophobia, anorexia nervosa, acute personality disorders, bulimia, drug/solvent abuse and violent/aggressive behaviours).

Staff and clinicians complete a status spreadsheet that identifies spaces, activities, individuals' health conditions and likely emotions when using those spaces, and any other special considerations. This spreadsheet is used to produce a Design Prescription spreadsheet in which the architects identify the optimal healing environments for the various spaces by addressing each of the senses individually and offering appropriate warning signs about any major sensory stressors for particular patient groups. So, for example, the category 'sight' would address such issues as natural light, artificial light, colour and views. Patients with bipolar disorder and seasonal affective disorder would be advised to have east-facing windows. Beauchemin and Hays (1996) observed how psychiatric inpatients with sunny rooms had shorter stays (by two to three days) than those in dark rooms. Benedetti *et al* (2001) similarly noted that patients with bipolar disorder who had rooms with east-facing windows had shorter stays than those in west-facing rooms.

### Penal environments

Having designed more than 30 healthcare units in the UK, NA believes that its expertise can be applied to penal environments. These have many characteristics in common with mental healthcare environments (in terms of architecture, planning and, indeed, overlaps in patient/user groups). In addition, both sectors share new bodies of therapeutic evidence and therapeutic styles, evidence-based design, and the need for integrated planning in relation to the community.

NA is currently exploring behavioural disorders and environmental issues in penal establishments. A number of studies and reports have documented the need for appropriate means of rehabilitation for prisoners (see for example House of Commons (2005)). Indeed, many prisons represent perhaps the worst-case scenario of badly designed environments – badly designed, that is, in relation to prisoners' mental health. Prison environments tend to offer little to their inhabitants, who are often unable to reassess and restructure their lives even after reflective/isolation periods and counselling. The culture of a conventional prison extols the maxim of 'every man for himself', promotes a 'them and us' mentality, suppresses personal identity, and imposes compliance through force. We argue that a humanised personal environment, allowing various forms of self-expression, will encourage the prison resident to feel positive towards reintegration. Architects therefore need to work with therapists in order to agree the supportive therapeutic and environmental facilities likely to be required.

NA's research in relation to penal establishments indicates that easy and safe access to key personal and group activities in the prison is often lacking, and that this leads to frustration and aggression through a lack of freedom of movement. Prisoners' inability to manipulate

or control important aspects of their immediate environment is another cause of frustration (Wener, 1990; Wener *et al*, 1985; 1987). In contrast, if a prison inmate were able to regulate the airflow and temperature in their cell, or turn off the radio or light, they would be less likely to attack the source of the irritation. There is clearly a wide variety of ways in which the prison environment can affect the attitudes and behaviour of its users. We contend that the design of the prison environment is crucial to its operation and to the rehabilitative impact it might have on inmates, and hence to its ability to promote rather than demote the mental health of all those who engage with it.

### Conclusion

The senses are the tools through which we assess our environment. Through understanding the true dimensions and limitations of the senses the architect can both design with greater skill and create an environment that is truly responsive to the needs and vulnerabilities of the individuals within it. We predict a time when smart card access to a single acute/surgical bedroom will activate the hospital/residential unit management system into providing the optimal healing environment for that individual patient or resident. The data and technologies are already exist: what is required for implementation is an NHS trust with vision. 🌟

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