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ROBOTS IN THE OFFICE: DEVOLVING LANDSCAPE ARCHITECTURE TO ALGORITHMS

Some time ago in the mid 1980s, I attended a conference at the University of Strathclyde in Glasgow, concerned with the application of the nascent computer technology to landscape architecture. Under the name *Green Chips*, it was purportedly the first conference of its kind to be held in Britain and it heralded a number of new developments and practices in what came to be known as computer-aided design. Up to then, few if any landscape offices had embraced computers except perhaps in general 'house-keeping' management roles: word processing, job specification and billing on spreadsheets and some early plant selection databases. Computing machines were getting cheaper, mostly IBM clones, the so-called 'personal' computers. Apple had yet to make a significant appearance. The 'old guard' of landscape architects were quite reluctant to submit their creativity to a machine, let alone abandon traditional drawing boards to an untested and expensive alternative, even on a wave of a perceived paperless office future.

Since those days, not only landscape architecture but most human activities have been affected to an unforeseen degree by what can now be called the digital technologies. In fact it is virtually impossible to escape them. Most visible are the ever-present mobile phones. Access to the internet is seen as a human right. Yet in the aftermath of the Cambridge Analytica revelations, where personal 'data' were harvested for subsequent commercial, even political, reuse, it is not difficult to appreciate the reluctance of those 'neoluddites' who harbour an instinctive distrust of technological innovation. Celebrities such as Paul Merton have even announced they don't own a mobile phone and have come off Facebook and Twitter. Children are being encouraged to eschew screentime to reconnect with their real world.

On the other hand, technology has clearly brought a wealth of benefits to our private, social and work-related lives. In the field of landscape architecture, computer-aided design (CAD) software has replaced some of the most monotonous, soul-destroying drawing activities: accurate graphical constructions, repetitive placement of tree forms, general rendering and shading. In my own area of geographic information systems (GIS), I have seen the acquisition and application of location data in mobile devices, car satnavs and personal fitness trackers transforming the way we see the world and navigate through it. Landscape architects have been grateful beneficiaries of these global resources enabling them to investigate site conditions anywhere in the world, to superimpose thematic maps exploring relationships and modelling future landscape changes in two- and three-dimensions. Currently the excitement is with the use of immersive systems, virtual and augmented realities, cinematic animations and algorithmically

managed parametric site analyses. Just study the cutting-edge exemplars in Amoroso's recent book *Digital Landscape Architecture Now*.

I once promoted the idea that landscape designers should willingly embrace computing technologies, not by merely being trained users of the programs but by being educated in the appropriate use of the technology. The practitioner I had in mind was one who was both fairly competent in CAD, GIS and image visualisation programs as well as informed enough to know their limitations and potential. Knowing when to use and when to discard them. But in today's commercially-pressured world, it is difficult to forgo the promotional advantages of automated systems, of customised programs that do the analyses for you, provide design solutions and generally save time. They seem to relegate your human creative input to a minimum.

It is a rare office these days where you can still see drawing boards (actually being used). So too in our university course studios. Landscape architects in practice and in training all undertake their tasks and assignments in front of computer screens. And this is not necessarily a bad thing. Software packages offer consistent precision and quality little matched by traditional methods. As computers have become more sophisticated and complex, so too have they become, paradoxically, increasingly user-friendly and easier to use. Fewer commands, more automation, more time saving. But are we becoming deskilled in the process, from the very essence, the *sine qua non*, of landscape architecture?

The question posed in the title of this piece alludes to the current debate about all things robotic, smart systems and artificial intelligence (AI). What is a robot anyway but simply a computer-controlled machine designed for a certain task. Will the increasing use of robots result in the loss of jobs? Inevitably yes. As we have seen, first those involving repetitive procedures: supermarket checkouts, auto-baristas serving coffee, border passport checking using face-recognition algorithms, ordering and having delivered online shopping. Then the upper level jobs requiring knowledge and experience will probably go. Might these include designers of all professions?

The summer exhibition at the V&A in London, *The Future Starts Here*, is celebrating the power of design to change the world of tomorrow and it showcases a range of digital appliances and projects offering benefits to our lives. Robots are there performing centre-stage. They are capable of learning by experience, clearly a human trait. But how near are we to making a machine that can do all the things we can do? According to Rory Hyde, the exhibition curator, "The robots are coming, but not that quickly". In the field of landscape architecture, we have to be prepared for this change but I just wonder how we should strive to maintain the human touch in creative activities. In situations where we need to stop and think, to deliberate or even reflect on our decisions. Then there is the whole ethical dimension that needs careful consideration. Can we trust a robot to make the right decision? Is it consistent, honest and truthful? Can we trust an algorithm? AI is too important to be left in the hands of a machine.

URBAN TALES: TRANSFORMATION PROJECTS FOR THE FLAMINIO AREA IN ROME

Paola Guarini ⁽¹⁾

We call the area included within the bend of the river Tiber the Flaminio district, starting from the ancient Porta Flaminia, the actual Porta del Popolo, that is a gate in the Aurelian Walls which delimit the historic centre of Rome. Defined as a suburban area, almost free of construction and destined for agriculture, it experienced its first urban development starting from the end of nineteenth century and has continued up to the present day. Even today it is an area in great transformation. Perhaps we can say that it is one of the richest areas of modern and contemporary architecture in Rome and where the most recent architectural and urban project competitions have been held.

Another aspect to underline is that this area has very particular morphological characteristics. The river Tiber is the main geographical component that gives the shape of the district, drawing an almost perfectly semi-circular bend (Fig 1). It is bounded by natural hills: the natural reserve of Monte Mario to the west and the Villa Glori, the Monti Parioli cliff and the Villa Borghese to the east. It is an area spatially defined by natural features and lies outside the Aurelian walls. The name of the area originates from the ancient consular via Flaminia, built in the middle of the 3rd century BC and being the main entrance from the north to the city.

During the Renaissance some important projects were realised here: the Villa Giulia by Vignola, the Fountain of Giulio III by Ammannati and the Church of Sant'Andrea by Vignola. We can also see the construction during this period of numerous suburban villas that will characterise the area until the middle of nineteenth century.

In the modern era the first significant urban planning proposals in the area consist of the three Valadier projects of the early 1800s, during the Napoleonic administration of the city. All three proposals, although presenting different configurations, are based on conceiving the line north of via Flaminia as a large boulevard for pedestrians, horses and carriages with a complex system of gardens and public spaces. It refers to a French

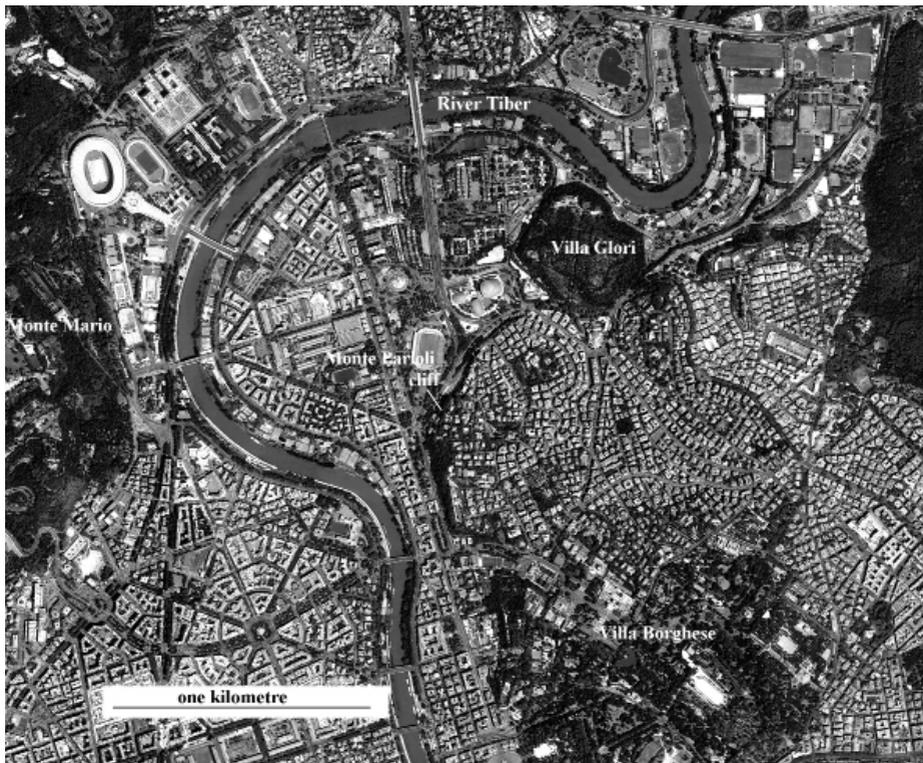


Fig 1: Satellite image of Flaminio (c) Google, 2016

model and represents the historical connection with the territory north of the Roman walls and with France.

During the nineteenth century, this vast bend in the river Tiber was already imagined as a park or green settlement, whose form was clearly defined by the geometry of the river and by the rectilinear axis of via Flaminia.

Since 1870, when Rome became the capital of Italy, the area began to develop an industrial character due to some industrial construction outside the Porta del Popolo – the slaughterhouse, the gasometer, and the storage of (animal-powered) trams and then electric cars – and later during the early 1900s, industrial settlement began in the bend of the Tiber on via Guido Reni. This period marks the beginning of the urbanisation of the area.

The urban arrangement of the area is shown in the 1909 Sanjust general town plan of Rome (Fig 2). The plan draws not only built lots on the west of via Flaminia but also connections with the other side of the river over numerous bridges that were not built but proposed. The residential



Fig 2: Sanjust general town plan of Rome

neighbourhood is characterised by different types buildings: court blocks, intensive complexes and palazzine (apartment buildings).

With the International Exposition of 1911, the area defined its character as a centre for sports and leisure: the Parioli Hippodrome (inaugurated in 1911, closed in 1929) and the National Stadium were built. At the beginning of the first world war the industrial areas of via Guido Reni were converted to military use including the construction of a pair of symmetrical barracks along via Guido Reni.

The General Plan of 1931 (by Piacentini and Giovannoni) confirms the residential configuration of the area in the bend of the river on the west of via Flaminia. On the slopes of Monte Mario, between 1932 and 1938, the

Foro Mussolini sports complex (the actual Foro Italoico complex), by Enrico del Debbio, was constructed. In addition the Duca d'Aosta bridge was built, connecting the new sports complex to the Flaminio area. After the break of the second world war, the 1960 Olympic Games opened a new phase of urban transformation of the area.

It was necessary in just four years to equip the capital with all the facilities for the sporting competitions. The most complex problem was to offer accommodation to more than eight thousand people including athletes, organisers, coaches and press representatives. The Villaggio Olimpico (1958-60 – by Cafiero, Libera, Luccichenti, Monaco and Moretti) was built. It represents one of the most significant examples of modern urban complexes realised in Rome, the style adhering to the principles of the Modern movement. Following the Olympic Games, houses were assigned to state employees.

Sports facilities such as Palazzetto dello Sport (1956-58) and Stadio Flaminio (1957-59) were built, so confirming the sporting priority of the area since the beginning of century. The project of Palazzetto was conceived and designed by the architect Annibale Vitellozzi and the engineer Pier Luigi Nervi, to accommodate sports such as basketball and weightlifting. The prefabricated cover made entirely of reinforced concrete and supported by 36 Y-shaped pillars is a very interesting feature (Fig 3).



Fig 3: Palazzetto dello Sport, 1956-8 (photo: Maurizio Alecci, 2012)



Fig 4: Elevated concert halls of l'Auditorium della Musica (see note 3)

The new Stadio Flaminio was built on Stadio Nazionale ground, designed by architect Antonio Nervi with the engineering-structural project of his father Pier Luigi Nervi. The football stadium could accommodate about 50,000 people and also included four gyms, a swimming pool, bar, changing rooms, first aid facilities. The structure is completely of reinforced concrete. At the same time the Corso Francia viaduct was built (1958-60), being conceived as a new entrance to the city from the north to replace via Flaminia.

For a long time Flaminio suffered abandonment and under-utilisation. Starting from 1994 a new interest in this urban sector emerged, as evidenced by the numerous design competitions held here from that time till today. At the beginning of 1994 the Auditorium Parco della Musica international architectural competition was launched. The project proposals express two principal different approaches: the first one underlines the relationship with the Flaminio district, the second one looks for a continuity with the Villa Glori. The competition was won by Renzo Piano whose proposal (Fig 4) finds a conciliation between the two approaches. It includes an artificial hill as an extension of the Villa Glori and three concert halls embrace a large *cavea* (2) open to the Villaggio Olimpico.

The relationship with via Flaminia is manifest through the parking areas perpendicular to the tree-lined via de Coubertin which is the main access to the Auditorium. The project changed during construction, following an unexpected discovery of a Roman villa within the site. For this reason, the concert halls level has been elevated and the *cavea* remained hidden in between these higher volumes, losing the visual and spatial references with Villa Glori and the Villaggio Olimpico.

The MAXXI competition for the National Museum of the 21st Century Arts was launched in 1998 and was to be located in the area of the former Montello barracks in via Guido Reni. The competition brief asked to integrate the new museum with the Flaminio district urban context, to preserve the facade of ancient barracks on via Guido Reni, and to create open spaces in continuity with the neighbourhood. It was won by Zaha Hadid. The jury chose the project not only for the creativity of its architectural solution, but also for its

potential to integrate the surrounding urban context. The outdoor space of museum, during opening hours, represents a real extension of urban public space (Fig 5).

The “Due ponti sul Tevere” [Two Bridges on the Tiber] Competition of 1999 offered the possibility for the construction of two new bridges over the Tiber. One of these is the Ponte della Musica, aligned with the via Guido Reni and representing the link between the Flaminio area and the other side of river, its right bank. Made of steel and reinforced concrete, it is reserved for cycling and pedestrian use, as well as for tram public transport. This international bridge design competition was won by the Buro Happold studio.

In the same years of these architectural competitions, the new general town plan of Rome was conceived. In particular the town plan of 2008 recognises the historical, architectural and cultural values of the Flaminio urban sector, rich in architectural works and of high landscape value. According to the plan it represents an important territorial resource of public property ownership.

The new plan envisages an area transformation through a unitary urban programme, the Flaminio Urban Project (Fig 6), in order to show the overall



Fig 5: MAXXI urban public space

structure, to verify its transformation and its economic feasibility. With the Flaminio Urban Project, the east-west axis will become the new Promenade of Arts between Villa Glori and Monte Mario crossing the Tiber at the Ponte della Musica. The Promenade of Arts links Renzo Piano’s auditorium, the Olympic buildings by Nervi and the MAXXI by Zaha Hadid (Fig 7).

Recently in 2015, another international competition took place: the project for the district of the city of science. This transformation concerns the former barracks of via Guido Reni, to be used as a science museum, social housing, private housing, commercial spaces and accommodation facilities. The masterplan by Paola Viganò’s Studio 015, winner of the competition, places commercial activities on via Guido Reni, while the inner area is dedicated to public services. The upper levels of buildings are intended for residential functions. The City of Science links continuously with the MAXXI outdoor space.

The interesting urban development of the Flaminio area, the presence of important modern and contemporary architecture, the particularity of its



Fig 6: Flaminio urban project: indicative outline, 2003-8 (3)

morphological characteristics and the richness of the natural landscape, have led to the development of numerous university research projects. I intend below to summarise two university research projects we have worked on, as a research team.

The first one is called *Roma Flaminio, Città della Cultura* (3) and it identifies as its theme the new auditorium square and the Olympic architecture parterre, the Palazzetto dello Sport and the Stadio Flaminio.

The first study underlines the need to resolve the integration of the auditorium with its urban surroundings. On the one hand, we have worked on the rehabilitation of this complex with the Stadio Flaminio and the Palazzetto dello Sport, looking for possible solutions of conformity of the empty space that extends from the Villa Glori to via Flaminia. On the other hand, we have studied the possible relationships between the auditorium, the Villa Glori and the public spaces of the Villaggio Olimpico, by designing a new auditorium square. Two proposals have been put forward that refer to two different morphological models: the plane and the enclosure (Fig 8).



Fig 7: Promenade of Arts & Auditorium della Musica in distance (photo Maurizio Alecci)

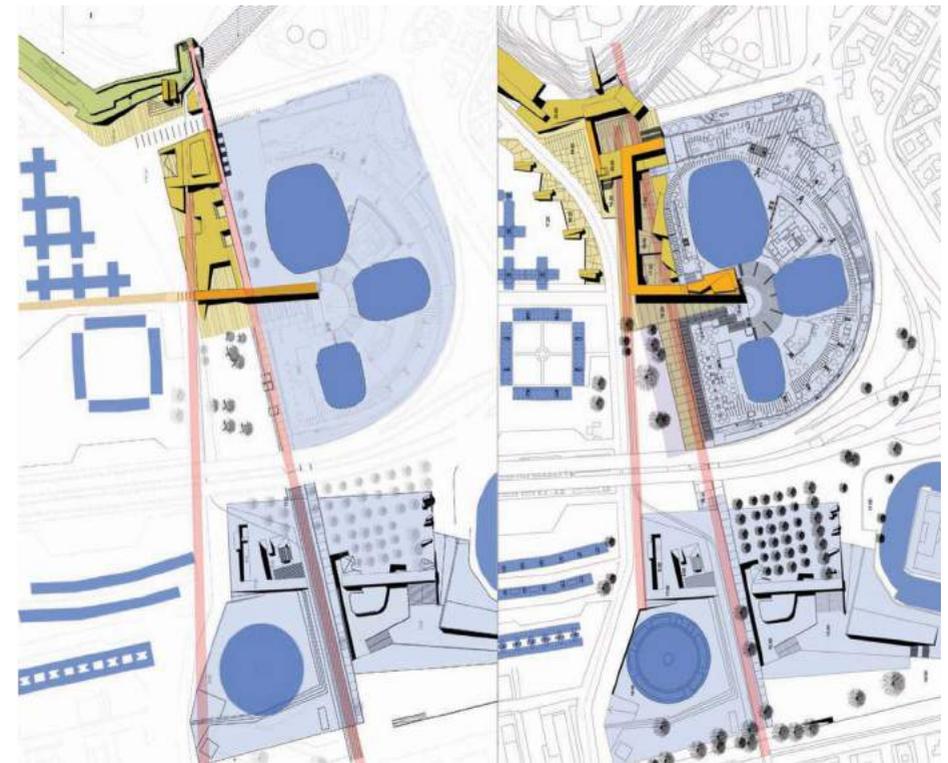


Fig 8: University research 2002-3. design proposal. Inclusive square and inclined square

‘Piazza inclinata’ [inclined square] has a sloping plane as the main element of the project. It proposes an artificial hill, with small courtyards facing spaces containing auditorium services. ‘Piazza inclusiva’ [inclusive square] designs an enclosure that defines an urban square, reconceiving the relationship between the auditorium and the public spaces in front of the Parco della Musica. Both proposals redesign the Villa Glori slopes. Both of them also offer a redesign of the extensive empty space between the Stadio Flaminio, the Palazzetto dello Sport and the Corso Francia viaduct. The project proposal also includes the modelling of the ground, defining a two level square, which allows the direct entrance to a station of the future underground line.

The second research study we are currently working on is called *Tra Monte Mario, Ponte Milvio, Villa Glori e Porta del Popolo. Analisi urbane e strategie di progetto per il quartiere Flaminio, distretto culturale di Roma* (4) It has the aim of identifying some urban planning themes and exploring some hypotheses of transformation. We have identified the main urban areas and the more important nodes on which the research group want to focus

attention. In addition, we have undertaken a network analysis of the roads, driveways, cycle paths and pedestrian walkways (Fig 9).

More precisely, we have identified three main urban themes on which to develop project reasoning: the river city (A), the Flaminio promenade along the cliff (B) and the Promenade of the Arts between the Villa Glori and Monte Mario (C). These are three urban systems on which we will converge in the next phase of the work. The aim is to solve the urban relationships between discontinuous parts of the city, proposing new visions for the Flaminio area and new models of living the urban experience.

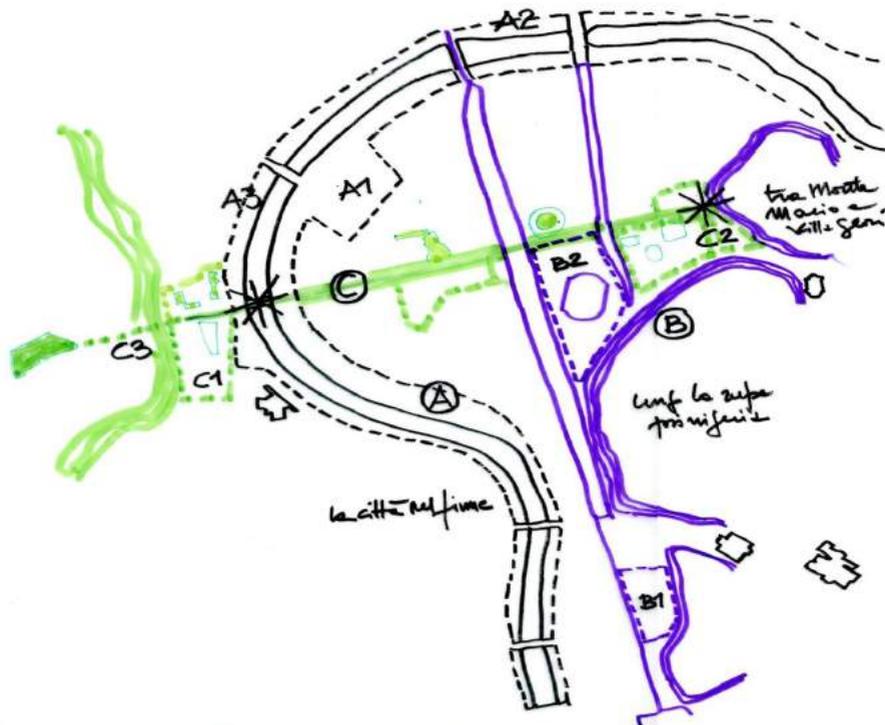


Fig 9: University research 2016-18 preliminary sketches (see text for key)

Notes

(1) This is a transcript of a talk summarising the urban history and the development of projects in the Flaminio area given to students of the Landscape Architecture course of the University of Gloucestershire on the 13th of March 2018, at the Department of Architettura e Progetto, Sapienza University of Rome. This presentation is part of the university funded research (see 4).

(2) *Cavea* (or enclosure) refers to the seating sections of Roman theatres and amphitheatres.

(3) University funded research (2002-3) coordinated by Professor Raffaele Panella, with the research team of Antonella Bonavita, Roberto De Sanctis, Caterina La Cava, Fabrizio Germani, Paola Guarini, Manuela Raitano, Daniele Romani, and Cristiana Sarapo.

(4) University funded research (2016) coordinated by Professor Piero Ostilio Rossi. Research team: Andrea Bruschi, Paola Veronica Dell'Aira, Paola Guarini, Francesca R. Castelli, Raffella Gatti, Caterina Padoa Schioppa, Luca Porqueddu, Gianpaola Spirito and Giovanni Rocco Cellini.

Biographical notes

Paola Guarini, graduated in Architecture in 1995 at Sapienza, University of Rome, where she also obtained her PhD in 2001. Since 2006 she has been a lecturer in Architectural Design in the Faculty of Architecture, Sapienza University. She undertakes many theoretical and practice research projects on architectural and urban design. Her field of investigation is mainly focused on the themes recovery and enhancement of the architectural and urban heritage, the intervention in sites of historical-archaeological interest, the redevelopment of abandoned areas and the reconversion of existing buildings.

A HUMANITARIAN ROLE - HOW LANDSCAPE ARCHITECTS CAN DESIGN FOR THE WORLD'S POOR

Rhys Jones

ABSTRACT

I have taken the 'contexts' of the world's poor to be refugee camps and slums, due to their dire living conditions. Therefore, the specific question of this paper is: what design methodology should landscape architects use to improve the living conditions of refugee camps and slums? Before deciding, it is necessary to look at both the global practice of landscape architecture and the current living conditions within the camps and slums. From my analysis and evaluation, my conclusion is that the profession should increase its presence within the humanitarian sector and determine its most appropriate role. Drawing out the key points for a design methodology, I have proposed a 'best practice guide'.

METHODOLOGY

All of the information presented in this paper is derived from two sources: desk-based secondary research and insight from industry professionals acquired through conversations. The secondary research consists of articles, blogs, dissertations, journals, reports, videos, and websites. The information drawn from these forms the conclusions which are tested on the industry professionals: researchers and practitioners who discussed how landscape architecture might increase its presence in the humanitarian design sector.

LANDSCAPE ARCHITECTURE PRACTICE

At the international level, landscape architecture is represented by the International Federation of Landscape Architects (IFLA), which includes 71 member associations (i.e. delegates from nations). It describes landscape architecture as having a “holistic and strategic approach needed to provide support to communities in dealing with global threats and challenges” (IFLA, no date, a) and that it could be a tool to “empower communities and people who are concerned with economy, health and sustainability of their culture and environment”. IFLA also runs the International Landscape Convention, the aim of which is to establish landscape architecture as a “holistic tool for planning, managing and creating sustainable development”.

At the continental level, the European Landscape Convention (ELC) is the landscape branch of the Council of Europe which “promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues” (Council of Europe, 2017a). Although it isn't a ‘governing body’ as such, its aims can be seen to represent the landscape practice of Europe. The convention sees landscape as a “policy area in its own right” (Council of Europe, 2017b) and is the first international treaty of a profession which is responsible for “sustainable development based on a balanced and harmonious relationship between social needs, economic activity, the environment and culture” (Council of Europe, 2016, p. 9).

Here in the UK, landscape architects are represented by the Landscape Institute (LI) which describes landscape architecture as being “driven by creating inspiring places that connect people to their environment” (Landscape Institute, 2016a). On landscape architecture's place in the world, it says: “The world is facing the growing challenges of explosive population growth, placing pressure on food systems, sustainability, transport, infrastructure and housing, while climate change affects weather systems, plant and animal life. Landscape architects are uniquely placed to meet these challenges head on” (Landscape Institute, 2015a). Further to this, the Institute describes landscape as adding value by “bringing new life to urban areas, contributing to public health and well-being, tackling climate change and protecting our environment” (Landscape Institute, 2016a).

It is apparent that three tiers of landscape associations describe the practice as being one that works holistically on environmental, social and health issues. It aims to improve



Fig 1 Calais Jungle



Fig 2 Za'atari Camp

the living conditions of those it designs for and to be a practice that should be put on the forefront of meeting contemporary challenges. These values have led to some successful projects: the LI's student-aimed website *Be A Landscape Architect* gives some examples that represent the profession (Landscape Institute: 2015b), the key themes amongst them being:

- Green infrastructure
- Ecology
- Public green space
- Landscape management
- Urban design and masterplanning
- Environmental stewardship
- Renewable energy
- Sustainable design
- Flood defence and sustainable drainage systems (SuDS)

However these are all projects completed in the UK, so they benefit citizens of the fifth largest economy in the world (Statistics Times, 2016). But how is landscape architecture practised throughout the world?

In 2015/16, the Council of Landscape Architectural Registration Board (CLARB) conducted a task analysis to understand current global landscape architecture practice. Most board members in are in USA, Canada and Puerto Rico (CLARB, 2015) but the analysis also included IFLA members (CLARB, 2016, p. 11). Due to an imbalance of respondents, the results from the United States, Canada and Puerto Rico (US-CA-PR) were recorded as their own region and the rest of the world (ROTW) was grouped as another. The ROTW region reported its top five areas of primary practice being within Sweden, Portugal, Netherlands, Italy and USA (ibid, pp. 20-22). When asked about international practice, respondents from US-CA-PR reported a majority of work in the Americas, followed by Asia-Pacific whilst the ROTW reported a heavy majority of international practice being in Europe. Within both regions, the vast majority of landscape architects were employed in the private sector (respectively 74.9% and 62%) (ibid, pp. 30-31). Outside this sector, it's interesting to note that of 4,650 respondents only 23 (from both regions) reported working for a non-governmental organisation (NGO) or charity, one of whom working for a "community disaster recovery practice" (ibid, p. 35). This imbalance of employment is reflected within the UK, with the LI reporting that 73.8% of landscape architect's work in the private sector (Landscape Institute, 2014, p. 4).

What this shows is that the vast majority of landscape architects across the world are working for private 'businesses', with only a handful working for a charitable cause.

REFUGEE CAMPS

The world is facing the largest displacement crisis since the second world war (UNHCR, 2016a, p. 5), with an estimated number of 65.3 million forcibly displaced people worldwide (larger than the UK population) – 21.3 million of these being refugees (ibid, p. 2). To clarify, a refugee is defined as "an individual who is outside his/her country of nationality/habitual residence who is unable/unwilling to return due to a well-founded fear of persecution based on his/her race, religion, nationality, political opinion or membership in a particular social group" (International Justice Resource Centre, no date).

The question of concern is where do these millions of people go? According to the UN High Commissioner for Refugees Global Trends 2015 report, countries in developing regions have hosted an average of 86% of all refugees over the past three years, with this number being 13.9 million refugees at the end of 2015 – compared with the 2.2 million hosted by countries in developed regions (UNHCR, 2016a, p. 18). Four million of these have been given asylum by the Least Developed countries, defined as "the world's most impoverished and vulnerable communities" (Nations Online, no date), who are the "least able to meet the development needs of their own citizens, let alone the humanitarian needs often associated with refugee crises" (UNHCR, op cit). The report states that by the end of 2015, the countries with the largest numbers of refugees per GDP (PPP) per capita were all in



Fig 3 Dharavi (Parelkar, 2015)

developing regions (with the exception of Russia in 30th place). Twenty of these states are classified as Least Developed Countries (ibid, p. 18).

With regards to accommodation, the report says that only 25% of refugees live in a planned/managed camp, with a further 4% living in a self-settled camp and 67% living in individual accommodation (ibid, p. 53). Despite the UNHCR's best efforts, conditions in planned/managed camps are poor. In Lebanon, 70% of refugees live below the extreme poverty line, food security is a big issue and only half of 6-14 year olds attend school (UN News Centre, 2015). In Za'atari camp, Jordan, accessing basic services such as health and education can be a daily challenge for the resident refugees – there were also reported to be high cases of sexual violence and rape (Weston, 2015), meaning girls and women feel unsafe using the communal toilets and kitchens (Iaccino, 2014). Other camps have been described as having unacceptable living conditions (Médecins Sans Frontières, no date), with identified issues being:

Malnourishment (Iaccino, op cit and Médecins Sans Frontières, op cit)

Poor hygiene and spread of disease (Iaccino, op cit and Médecins Sans Frontières, op cit)

Lack of access to toilets and a functioning sewage system (Kruijt, 2014, p. 71)

High rate of child mortality (Iaccino, op cit)

Water unfit for consumption (Iaccino, op cit and Kruijt, op cit, p.71)

Conditions are worse for those living in self-settled camps; the most infamous example being the Calais Jungle, which was recently demolished by French authorities. The camp was described as “cramped makeshift tents plagued by rats, water sources contaminated by faeces and inhabitants suffering from tuberculosis, scabies and post-traumatic stress”, according to a report from researchers at the University of Birmingham (Topping, 2015). A piped water tap was found to have E-coli and coliform present, “indicative of faecal contamination”. It was estimated that there is one toilet per 75 inhabitants (far below the UNHCR standard of 1:20). Often they were overflowing, resulting in extremely poor hygiene conditions. People were “hungry and distressed” with access to only one meal a day. The camp was described by another article as being a “slum” (Flinder, cited in Fairs, 2016).

Both types of camps fail in terms of social needs too. In the Jungle a fear of sexual violence resulted in women grouping together or with family members for safety. Residents also reported being attacked by the locals and police (Topping, op cit). In another article, a camp in Bekaa Valley, Lebanon, is described as not being built to accommodate the “expression of

community in celebrations” and that women have privacy issues due to the structure and layout of the tents (Craig, 2015). The UN planned/managed camps are often laid out like a military camp (ibid) and are “stripped of identity” (Flinder, op cit), leading to increased mental stress in already mentally damaged people (Knowles, 2015).

What makes this situation worse is that refugees are not living in these places temporarily; the reality is that the average lifespan of a refugee camp is seven years (Kennedy, 2015, p. 1) Some sources report this to be as much as 17, but this is a disputable figure (White, 2015). It could be assumed that this would have the long-term effects of a ‘brain-drain’ due to the lack of educational services reaching children, creating a seven-year gap in a lot of children’s education.

It’s clear that an urgent solution is needed, which the UNHCR says it and states together are the key actors in providing (UNHCR, 2016a, p. 23). In 2015, the UNHCR provided a solution to 340,500 refugees through returning home, resettled or being integrated into the host country (ibid, pp. 25-27). Despite being a significant number, it falls vastly short of the 1.8 million new refugees in 2015 (ibid, p. 2) – therefore these solutions are clearly not sustainable in the current climate. The UNHCR also reports that its resources are stretched, stating never before has it had to “manage its programmed operations with such a high funding gap between approved budgetary requirements and funds received” (UNHCR, 2016b, p. 1).

SLUMS

The 2016 World Cities Report states that four billion of the world’s population now live in urban areas, with a yearly average increase of 77 million (between 2010-15) (UN Habitat, 2016, p. 6). This means that the percentage of global population now living in urban areas has increased from 45% in 1995 to 54% today (ibid, p. 51). The highest rates of increase are in Asia, Africa and Latin America and Caribbean (LAC) respectively, with the urban population of developing countries predicted to double by 2030 (ibid, p. 7). As of 2014, 881 million people live in slums (ibid, p. 48) equating to 1/8 world’s population, 29.7% of the urban population in developing countries (ibid, p. 14) and more people than the entire population of Europe, Canada and Australia combined.

The report describes slums as being the products of “failed policies, poor governance, corruption, inappropriate regulation, dysfunctional land markets, unresponsive financial systems and a lack of political will” (ibid, p. 57). They are caused by a currently unsustainable urbanisation model (ibid, pp. 1 and 13) and the simple fact is that the residents cannot afford

formal housing (ibid, pp. 52-57). In layman's terms: as the world's cities developed its poor were left to their own devices and settled in where they could afford – slums. But what constitutes a 'slum'? It can be defined (ibid, p.57) as a contiguous settlement that lacks one or more of the following five conditions:

- Access to clean water
- Access to improved sanitation
- Sufficient living area that is not overcrowded
- Durable housing
- Secure tenure

This World Cities report also defines a slum as having the characteristics of “poor physical condition, overcrowding, poor access to services, city functions and employment opportunities” (ibid, p. 51). In 2011, urban sub-Saharan Africa electricity was only available to 32% of the population and the 2010 sanitation rate at 54% for Africa's entire urban population led to diseases such as cholera 'plaguing' them.

But for the people who live in slums, it means a landscape defined by “narrow dirty alleyways, open sewers and trash” (Goldberg, 2015) with evident health concerns. To take the example of Dharavi in Mumbai, it has been described by various sources as having problems resulting from a population density of one million people per square mile: there is a serious lack of space and families often live together in very small dwellings (12 x 12 ft for example). Rooms in these dwellings will take on multiple functions and often be used as an area to live, sleep and work in, but can cost as little as \$3 a month (ibid). There is also a total lack of sanitation or adequate water provision; toilets are shared by 500–1,450 people, so most people use alleyways or the river which children play in; water pipes are in a bad condition and run alongside this sewage, which contaminates the drinking water. Doctors deal with 4,000 cases of diphtheria and typhoid a day and the average life expectancy is under 60; the residential area lacks any sort of infrastructure such as roads or public conveniences (coolgeography, no date; Goldberg, op cit).

Despite all this, life in Dharavi has been described as being “poorer in material wealth but richer socially” (coolgeography, op cit) for its estimated one million residents. Family life dominates and chores are usually done socially as people live so close to one another. There is a real sense of community (ibid) and a 'joie de vivre' (Mondal, no date). Employment in the slum is at around 85% and most work locally (coolgeography, op cit), which contributes to Dharavi's estimated annual business turnover of \$1 billion. A lot of this is through the multifunctional rooms, which equate to



Fig 4 Church at Calais Jungle

Fig 5 Torre David

15,000 single-room factories; in fact many businesses have generated an income of \$1 million (Goldberg, op cit). In his TED talk *Why Squatter Cities Are A Good Thing*, urbanist Stewart Brand also discusses how important the informal economy is in slums, accounting for 60% of employment in developing countries (TED, 2008).

However, as an example of a slum, Dharavi can be seen as an exception; it's been established for over 60 years (Goldberg, op cit) and has a thriving economy which may give it an advantage over the typical slum. But it has been widely written about so it makes a good resource for analysing slum life. Another well-known slum is Kibera in Nairobi, which has a 250,000-strong population inhabiting riverbanks and waste-tips (Campbell-Clause, 2013). Environmentally, conditions are very similar to Dharavi, the key differences being that only 20% of Kibera has electricity and one toilet is shared by 50 houses (Kibera, no date). The average dwelling size of 12 x 12 ft is also the same as Dharavi and 90% of the population rent them (at around £6 a month). Economically however, unemployment is at around 50%, so people turn to drinking and drugs which leads to violence, crimes and rape. Around 50% of girls aged 16-25 are pregnant, a condition mostly unwanted and so they go through a dangerous abortion and as there are no government clinics or hospitals, the providers of this are charitable organisations such as AMREF, Médecins Sans Frontières and various churches (op cit).

In light of these issues described above, the World Cities Report calls for cities to ensure universal access to basic services like water, sanitation, waste management, energy, food and mobility, which are crucial to socioeconomic welfare, public health and the urban environment, a solution requiring “the concerted efforts of all stakeholders”. It states that “urbanisation is closely associated with development; slum dwellers will be left behind in this

process if their concerns are not integrated into urban legislation, planning and financing frameworks” and sets out a target that “by 2030, [there will be] access for all to adequate, safe and affordable housing and basic services and upgrade slums” (UN Habitat, 2016, pp. 57 et seq).

UN-Habitat has also proposed a strategy that puts housing at the centre of the New Urban Agenda providing guidance to governments, international development funders, UN programmes and civil society for the next 20 years (Citiscopes, no date). It was ratified by UN member states at the 2016 Habitat 3 Cities Conference and “seeks to create a mutually reinforcing relationship between urbanisation and development, the idea being these two concepts will become parallel vehicles for sustainable development”. With regards to slums, the Agenda outlined the need for: the strengthening of the resilience of cities and human settlements; promoting the upgrading of slums – avoiding spatial and socioeconomic segregation; supporting incremental housing and self-build schemes; and increased financial and human resources for the upgrading and prevention of slums. (UN General Assembly, 2016, pp. 15 et seq)

Attempting a summary of the research I have undertaken, I present the following table listing the key features of the camps and slums and propose the broad aims of landscape architecture.

Refugee camps	Slums	Landscape architecture
Disproportionately located in developing regions Lack of food Stretched health and education services Insecure Lack of toilets, poor hygiene and spread of disease Water unfit for consumption Poor camp design and quality of shelter	Contaminated water Lack of sanitation, services and toilets Overcrowded living space Spread of disease Lack of infrastructure and government hospitals or institutions Environmental pollution	Holistic and sustainable design approach which balances social, cultural, environmental, economic and health needs Empowering communities Urban design Green infrastructure Renewable energy Flood defence and SuDS Environmental safeguarding

It is salutary to compare these three lists, and to note that many of the problems identified are currently the type of issues that landscape architects aim to tackle. However the vast majority of landscape architecture work is primarily in developed nations and organisations working in refugee camps and slums tend to be NGOs – a sector which only employs a handful of landscape architects worldwide. At a recent exposition in Brussels called AidEx, which included NGOs and private companies all operating in the development and aid industry, almost all of the representatives that the

author spoke to said that they did not work with landscape architects (Aidex, 2017).

But to conclude, it appears that the landscape architecture profession does promote its values in its practice – but disproportionately so in the developed world. It is currently missing a globally significant beneficiary and needs to be a key stakeholder in the UN’s strategies to improve the fortune of refugee camps and slums. Yet the landscape profession is indeed ideally placed to meet the world’s growing challenges head on (Landscape Institute, 2015a) and it needs to be a more involved player in the design community.

THE ROLE OF THE DESIGN COMMUNITY

The role that the design community should take in designing for slums and refugee camps is a contested issue – in terms of what is the best approach to take as well as the level of involvement of the community. For example, there have been calls by architects for the profession to become more involved in the refugee crisis: “Architects must play a role in the challenge” – Jeannie Lee, EVA Studio (cited in Winston, 2016). “We need to see long term thinking. Building work needs to be part of the solution” – Robin Cross, (cited in Mark, 2015). “If there’s anyone with a moral obligation to provide



Fig 6 Communal water tap in Kibera

safe, affordable and sustainable shelter, it's most definitely architects" – Katherine Allen, ArchDaily (2013).

TOP-DOWN APPROACHES

The problem with a lot of projects is that designers simply don't know the contexts they are addressing intimately enough, typically designing in response to their perceptions (often misconceptions) rather than real-life problems. Such projects maintain the traditional client-customer relationship, as seen through the following examples:

\$300 House-for-the-Poor

This was a concept developed by Vijay Govindarajan and Christian Sarkar in response to the lack of affordable housing available to slum dwellers. The unit is basically a "single room structure with drop-down partitions for privacy" (Govindarajan, 2010) which would be mass-produced and standardised. This would be developed in collaboration "between global design and engineering companies and non-profits with experience solving problems for the poor" and would allow the owners to take ownership of their homes, moving beyond charity.

This appears to be a counter-productive business model for slum dwellers, as much of their economy is built on informal construction. This opinion is also shared by Matias Echanove and Rahul Srivastava of the Dharavi-based Institute of Urbanology, who state that "construction is an important industry" in slums and the project could "put many people out of business". These statements are taken from their article *Hands Off Our Homes* for the New York Times (2011), which is a criticism of the \$300 house concept. They also note the designers have failed to consult any slum dwellers on the design, and that if they did then they might have realised that homes often become multifunctional 'tool houses' which have been upgraded through the generations – something that wouldn't be possible with a standardised design. Echanove and Srivastava feel that the project could be harmful and that a better approach would be "to help residents build better, safer homes for themselves" (ibid).

What Can Design Do (WCDD)

What Design Can Do (WDCD) is a Dutch organisation that showcases design and "promotes it as a way of addressing the societal questions of our time" (WDCD, no date, a) and, in partnership with UNHCR and the IKEA Foundation (WDCD, no date, b), held the Refugee Challenge in 2016 in response to the refugee crisis in Europe. This called for enduring solutions

to help both refugees and European cities adapt to a crisis that involved problems "too complex for one institution alone to address" (WDCD, no date, c). The challenge offered five briefs:

- Improve shelters and reception centres
 - Foster personal development while waiting for asylum
 - Bring refugees and host communities closer to one another
 - Exchange essential information with refugees
 - Maximise the potential of refugees
- (WDCD, no date, d)

Whilst the challenge is admirably well-intended and shows solidarity with refugees, it has been described as "doing more harm than good". This comes from Ruben Pater's article *Treating the refugee crisis as a design problem is problematic* (2016) which while appreciating the intentions of the challenge, heavily criticises its execution. By framing the crisis as a design challenge it "supports the idea that the free market is much better at solving the world's crises than governments are", a dangerous notion should governments use it as an excuse to cut the "resources, infrastructure and laws" that only they and NGOs can provide in the long-term. Pater also criticises the challenge's first brief, as 'shelter' will mean the "temporary housing facilities that refugees stay in" whilst awaiting their asylum decision. The risk is that this could legitimise a refugee's state of temporary living which "discourage[s] refugees from coming to Europe". Overall, he thinks that it's "absurd to suggest that design can come up with solutions for a crisis that is political and socio-economic at heart" and that it has to be seen in its totality, rather than an "isolated design issue" (Pater, op cit).

SELF-BUILT SETTLEMENTS

The above examples reveal the 'gaps' in top-down approaches and it would seem that they both lack an understanding of the full context of the problem. They might also lack a realisation that there is a lot of ingenuity and capability in self-built settlements.

Calais Jungle – France

When architect Grainne Hassett visited the Jungle in 2015 she was struck by what she saw, which was a "prototype city in the making", describing an "urbanism which felt very authentic, very deeply rooted in their cultures" (cited in Wainwright, 2016). Despite the deprived living conditions, the camp has been described as a great example of how people's culture and identity shine through in settlements which are self-built (Fairs, 2016; Hassett and Mull, cited in Wainwright, op cit), something that is lacking in

government/organisation-established refugee camps (Flinder cited in Fairs, 2016; Hassett cited in Wainwright, op cit). Architecture student Sophie Flinder has also described the camp as “an important resource for all urban professionals to study” as it is a “real-life symbol of people’s desires, needs and priorities” (cited in Fairs, op cit). It has become a ‘place’ where people engage socially and have created a town for themselves, without the assistance of any urban professionals (Flinder, op cit). Grainne Hassett also describes the refugees as being “very entrepreneurial” and more than capable of building a city, as they have built a community that gives them “a sense of ownership” – something lacking from the established camps (cited in Wainwright, op cit).

Torre David – Caracas, Venezuela

This is an incomplete skyscraper in Venezuela’s capital Caracas, the construction of which was halted in 1994 due to a banking crisis. Left untouched by officials and with the city facing a housing shortage in the early 21st century, squatters moved into the tower and formed what can be described as a ‘vertical slum’ (Centro Financiero Confinanzas, no date). The occupation became a lesson in the self-built nature of settlements, as described in Rory Stott’s article *Non-design: architecture’s (counter) intuitive future*. What is interesting is that the occupants not only created their own homes, “shops and a gym”, but their own governance too as they “follow a set of self-imposed rules to provide a more pleasant experience for the entire community” (2013). They also improved the infrastructure of the building, installing water to be supplied up to the 22nd floor of the building as well as having an unlicensed dentist (Centro Financiero Confinanzas, op cit). By creating their own environment the occupants “seeded a true community”, which Stott compares to the Western modernist housing developments of the 20th century, the residents of which experienced an “almost complete dissolution of community values” and hence didn’t feel ‘invested’ in them (Stott, op cit).

What these two case studies demonstrate is that people are actually very capable of creating communities, something that can be overlooked with designs that are ‘imposed’ onto people. Of course there are the issues that within these self-built settlements there is a lack of services and sanitation (as seen earlier), but it must be very difficult to create these with mostly improvised found materials and minimal funds. To use product designer terms, organisations and NGOs overlook their customers’ needs and desires in designing for slums and refugee camps, which can actually cause more detriment than benefit. With regards to refugee camps, thinking of them as being temporary places is a common criticism of current refugee camp design. (Kleinschmidt, 2015 and Allen, op cit). However in response to a call

for more long-term infrastructure to be built in camps, Phil Khorassandjian argues that “host nations would be very resistant, I would conjecture, to allow permanent or even semi-permanent buildings and infrastructure to be built” (cited in Mark, 2015).

Designers, therefore, cannot maintain their current business-like client-customer relationship if they hope to improve lives in slums and refugee camps – these are contexts that are simply far too complex to understand. They must also realise that the people who understand (and perhaps solve) the problems best are sometimes those who are the ‘customers’ themselves. What these settlements lack, however, is the power and infrastructural resource of organisations to create acceptable living conditions, and so a meeting point between the two is needed.

HOLISTIC APPROACHES

It would seem that the most successful projects are those in which the designers remove themselves from the client-customer relationship and places the customers as equals. By working in collaboration with refugees and slum-dwellers, a more complete understanding of the issues can be formulated and their ingenuity and entrepreneurship can be incorporated. Even better would be to involve all stakeholders in the design process, something the UN has called for. They also make the case for it in the report *Global Public Space Toolkit* (UN-Habitat, 2015), which was created to “address the issue of public space” and how it can “contribute to sustainable urban development and improved quality of life” (ibid, p. vi). It supports countries to develop urban planning methods to address current challenges arising from urbanisation, such as population growth, poverty and inequality (ibid, p. 4), with a focus on “cities in developing countries and with high percentages of their population living in slums and in underprivileged circumstances”. With regards to the creation, management and enjoyment of these public spaces, the report recommends “clear, transparent and participatory processes with all interested stakeholders”, requiring the collaboration of citizens, civil society and the private sector (ibid, pp 118 et seq). There are many design projects and organisations that put these principles into reality, and a few examples are described below.

Creative Capacity Building

Developed by the Massachusetts Institute of Technology’s D-Lab (MIT, 2016), this is a methodology that trains participants to create or adapt technologies that will improve their lives and strengthen their communities. It was born out of a visit to post-conflict areas in Uganda (in 2009), as described by D-Lab co-director Amy Smith: “We had gone there with the intention of

sharing some technologies that would help people with the transition from the internally displaced person (IDP) camps to their villages, but what we found was that rather than a need for a particular technology, there was a need for something that would counteract the sense of dependency that had built up in the camps. So, we thought it was more important to teach people how to make technologies rather than how to use a particular technology.” (Smith, 2016).

The Creative Capacity Building (CCB) is implemented at three levels:

1. Village-Level Training: a hands-on workshop that introduces the design process to community members, allowing them to develop, manufacture, repair and adapt technologies that suit their needs.
2. Community Innovation Centres: an integrated workshop, demonstration site, training centre and retail shop, with smaller shops in surrounding villages.
3. International Development Design Summits: similar to the Village-Level training, participants work in teams with community members to share the design process, identify problems and collaboratively create solutions and prototypes (International Development Innovation Network, no date).

One of the International Development Design Summits was *Rethink Relief*, which was run in partnership with the refugee agency UNHCR and aimed to address the gap between short-term relief and long-term sustainable development (Rethink Relief, no date).

As well as educating locals, the success of CCB is that it empowers them and gives them the opportunity to develop and finance their innovations independently (Smith, op cit). As well as being a more sustainable model of development, it takes the strain off external organisations.

Urban-Think Tank

Originating in Caracas, this is an interdisciplinary design team that’s concerned with architecture and urbanism – with a spotlight on slums. They aim to create “bridges between first world industry and third world informal areas” focussing on the “education and development of a new generation of professionals, who will transform cities in the 21st century” (Urban-Think Tank, no date, a). There are two projects which represent their approach well: Metro Cable and Empower Shack.

Metro Cable: based in the San Augustin barrio of Caracas, the practice realised that the social divide between the barrio and the rest of the city was exacerbated by the physical divide – a major highway and a canal. They intervened in a government plan to build a new road (involving the loss of

a third of the barrio’s homes and suggested a minimally invasive cable car system, which could transport the residents and bridge the divide. Their intervention also involved “plug-in buildings”, which were flexible units that would provide “housing, as well as cultural, community, and recreational programmes”. The completed cable-car line proved to be extremely popular and affordable, and served as “a model for future upgrading projects around the region”. The project recognises a legitimate need, and uses a multi-functional solution that could foster sustainable development (Urban-Think Tank, no date, b).

Empower Shack: a slum-upgrading project in the South African township of Khayelitsha (Urban-Think Tank, no date, c). Working in collaboration with community members and local professionals, the team began by organising a design and build workshop to develop a two-storey shack for a local resident. Once in place, this shack was used as a landmark to structure the layout for the rest of the community (ibid), being “more concerned with the general ‘system’ that surrounds housing... This includes the infrastructure that makes the housing decent, such as power and sanitation, along with the urban configuration of the homes” (Brillembourg, cited in Frearson, 2014). These new homes were built by the community members, who were trained by Urban-Think Tank as well as with the collaborating local professionals (Urban-Think Tank, op cit). The key to this project is that it was more than just a home-upgrade: it considered the infrastructure of the community, the long-term sustainability of the development and created “an interface between residents, professionals and the government”. The significance of this point is reinforced by the Global Public Space Toolkit, which states that “strategies relying prevalently on shelter might be missing the point” and improvements can best be achieved “by making public spaces available and endowing them with those facilities and services that most slum dwellers cannot create, manage and enjoy on an individual basis” (UN-Habitat, 2015, p. 47).

Cucula

Based in Berlin, Cucula is “an association, workshop and an educational programme” and craft company that encourages refugees to manufacture and sell design products (Cucula, no date). The philosophy of the organisation is to achieve something with refugees rather than for them; in fact the name originates from the Hausa language to mean ‘to do something together’. It breaks the notion of ‘victimhood’ and “supports refugees to build their own professional future”, with the proceeds of the sales being invested back into the refugees’ education and cost of living. The organisation recognises the refugees’ need to build their own future and utilises their entrepreneurship that was demonstrated in the self-built settlements, as well as lift them

from the role of ‘charitable recipient’ and into a contributing member of the host society (ibid).

Beyond Entropy: Angola

By simply planting bamboo and *Arundo donax* amongst a slum in Luanda, this intervention has the dual-purpose of filtering the sewage water and cleaning the air, whilst providing an efficient biomass fuel but preserving the built environment of the slum. The project acknowledges its “spatial logic”, as well as the “environmental and social damage that is caused by destroying these communities and replacing them with overly designed social housing” (Stott, 2013).

Quinta Monroy - Elemental

This renowned slum upgrading project involved the basic idea that if slum dwellers cannot afford to buy a whole house, then build ‘half a house’ (Architect Magazine, 2016). By keeping the existing community in place, the proposed units provided the basic infrastructure such as clean water and a sewage system and then allowed the residents to “divide up the space as they wished” – as they had “years of experience building their own homes in the previously illegal settlement” (Stott, op cit). The project addressed the typical issues of slum upgrading which were to improve sanitation, allow the government to legitimise the land and the “psychological desire of the residents to have a role in their own destiny” (ibid).

LANDSCAPE-LED HUMANITARIAN PROJECTS

Kounkuey Design Initiative

Although not solely landscape architects, Kounkuey Design Initiative’s (KDI) approach is very landscape-based, often producing what they call *Productive Public Spaces* (PPS) in slums and “underserved communities in the US, Africa and Latin America” (Kounkuey Design Initiative, no date a). PPS are formerly unusable areas that have become “active public spaces such as community meeting areas, vegetable gardens, and micro-enterprise and recreation spaces, along with basic infrastructure”. KDI use a participatory planning and design approach (similar to CCB) to empower communities to advocate for themselves, fostering sustainable development. In their approach they aim to “bring residents, local officials and the private sector” into the process as well as considering the “social and economic programs” to support the built solutions (ibid). From their beginnings, KDI invested in local designers, planners and architects to establish a local team – who can provide solutions to the issues themselves (Kilston, 2016).

Rightful Landscape

Dutch landscape architecture student Robert Kruijt travelled to Za’atari refugee camp (in Jordan) to pose the question: *What actions, based on an ecosystem approach, are needed to create more self-reliance and a sustainable environment in the development phase of Za’atari?* (Masters thesis, 2014, p. 19). As articulated in his thesis (pp 12 et seq), he understood the need for the rapid creation of a camp in the emergency stage of displacement but noted that they are only set up for a temporary lifespan and he argued that long-term solutions involving refugee participation needed to be considered. He also recognised that the relief system places refugees in an aid-recipient position, and that ecological systems aren’t considered in camp design.

He arranged some participatory workshops with refugees to establish some solutions to these problems, such as a lack of infrastructure (drainage, sewage and drinking water), vegetation and services (Kruijt, op cit, p. 71). The first problem he had to overcome with identifying solutions was that the refugees weren’t interested in improving the camp, as their sole concern was returning to Syria. Eventually they did collaborate and prototyped some ideas to solve the wastewater issues with grey water gardens, which contained plants that could filter the water as well as supply greenery (ibid, pp. 84-9). The prototypes were generally thought to be successful by refugees and NGOs and proved how skilled the refugees were (ibid, pp 88-98).

IFLA Refugee Workshop

A two-part workshop organised in collaboration between the American University of Beirut and IFLA to assist those in Lebanese refugee camps (IFLA, 2015). Its objective was to “investigate landscape design potentiality in setting out new approaches and methodology to convey the complexity of displaced by disaster”, and the second part “engaged Syrian refugees, Lebanese students and professors from around the world to design and build landscape-focussed interventions” (University of Pennsylvania School of Design, 2016). One of the attendees, (Professor Larry Harder of the University of Guelph, Canada) described the camp as not responding to the “cultural needs of the people living there” (cited in Craig, 2015) and that humanitarian conditions were not being met. He said the team hoped to “address the environmental and social needs” (cited in Craig, op cit) of the inhabitants and that they looked at “layout, the creation of communal spaces, environmental remediation, erosion and drainage” (Craig, op cit).

Taking lessons from above, I have attempted below to distil some ‘best practice’ guidelines and list them separately under slum and refugee camp categories.

Slums	Refugee camps
Community participation Involvement of multiple stakeholders Use of locally available/affordable resources Respect for the established built and social environment Consideration of the economical and social sustainability that supports the built solution	Refugee participation Involvement of organisations Consideration of social and cultural needs Moving away from sense of dependency Acknowledging that refugee situations are not 'temporary'

Design interventions cannot however be seen in isolation – they need to be considered as part of a wider strategy and context. In regard to slums, Justin McGuirk asks rhetorically: *Can a handful of socially conscientious architects even begin to address that situation? No, this will require political will* (2014). He thinks that the global scale of the problem is too large for just ‘activist architects’, and that “bottom-up impulses need to be connected to top-down infrastructural investment” (ibid), a notion shared by Urban-Think Tank founder Alfredo Brillembourg (Urban-Think Tank, no date, c). The late architect Lebbeus Woods also said that if slums are to be treated as a problem that needs a solution, then we need to be clear on that problem and analyse it from three standpoints: “their spatial construction, the social forces that underlie their construction and the philosophical beliefs that generate the social forces” (2011). By these ‘social forces’ he means the greater cause of inequality, as well as the intentions of government institutions and private companies who “at best have a ‘charity’ interest in ‘helping the poor’” (ibid). Although these examples are focussed on slums, the points made can be of relevance to refugee camps too.

To conclude, it seems as though landscape architects are using the right design methodology in designing for refugee camps and slums. This has a significant relevance to the Global Public Space Toolkit, as it states that “inter-disciplinary and participatory approaches to public-space design are an exciting opportunity for planners, landscape professionals, architects, technicians and designers to express fully their social roles” (UN-Habitat, 2015, p. 119). This would ring particularly true to landscape architects as public open space is considered their ‘domain’, so when working in these contexts it is particularly important to acknowledge the importance of holistic approaches.

From the overall research, however, the author’s general understanding is that landscape architecture has a low presence in the humanitarian design sector in terms of staff numbers (as seen from the CLARB Task Analysis described earlier), completed projects and the lack of a landscape-led humanitarian design industry compared with what’s seen within architecture and design. Of the limited case studies of landscape architecture

in this field, most have been either educational projects or theoretical journal articles – suggesting that landscape architecture’s place is still ‘emerging’ within the humanitarian design sector. As it would be clearly beneficial to millions of slum and refugee camp dwellers to feel the effects of landscape interventions, the question now becomes *How can this presence be increased so these interventions can have a wider reach?*

DEVELOPING HOME-GROWN LANDSCAPE ARCHITECTURE PRACTICE IN VULNERABLE COUNTRIES

As Phil Khorassandjian said in his response to the article *Buildings must be a part of the short-term refugee relief effort*, “Most developing countries have sufficiently skilled architects and technicians these days and often they know better than western minds what is needed, what is possible and what is sensible” (cited in Mark, 2015). This forms the basis of this action, the logic being that a native landscape architect in, say, Nairobi would have an inherent understanding of the issues within the slums there and will be able to come up with a better solution than a western landscape architect. In a refugee situation, the landscape architects among the fleeing population will also be able to synthesise the issues within the camp they reside in and their training – producing an appropriate solution.

For this development to happen, IFLA might simply need to instigate training within these countries. As the practice is more advanced in developed countries, representatives could serve as ‘missionaries’ to assist with these training programmes, sharing their knowledge and best practice. These programmes need not be specific to slum or refugee camp improvement and so the new profession could address other issues in their country when appropriate. The IFLA currently has 71 Member Associations worldwide and promotes itself of having the duty of global promotion of the profession (IFLA, no date, b) – but the time needs to come for this to happen in nations that really need it.

RESEARCH AND PILOT PROJECTS

Before taking measures to increase their presence in the humanitarian design sector, landscape architects should determine an appropriate role through research and pilot projects within the relevant contexts. Thus, the methods and approaches that are most appropriate to this kind of work can be discerned. The results could be collated into a shared ‘hub’ amongst the landscape profession, allowing them to build up a portfolio to educate the profession both within and without.

PROMOTING THE POTENTIAL HUMANITARIAN ROLE

Being more informed from the research and pilot projects, the Landscape Institute (LI) could be proactive in promoting the humanitarian role within the profession, which should begin with education. Currently, the LI aims to accredit landscape architecture courses which “reflect all aspects of the profession – landscape and urban design, historic landscapes, environmental conservation, landscape management, planning, ecology and more” (Landscape Institute, 2016b) without being specific to particular contexts – so slums and refugee camps could be included. However it must be important to teach according to the best practice guide, so could perhaps be focussed on how landscape architects can rationalise political and social structures within a context, demonstrate how to use creative capacity building, or create something from very limited resources. In other words, it would be more important to teach general skills that can be applied across multiple fields than simply for a very specific issue.

Beyond university, practitioners could be educated through Continuing Professional Development (CPD) – which needs to be taken on by all chartered members of the LI. CPD can be through seminars and courses, researching a problem, mentoring, volunteering, individual study, reading or visits (Landscape Institute, 2016c). All of these could be appropriate to humanitarian design, so the LI could set up opportunities for practitioners to do so. This could result in established landscape practices gaining the confidence to begin working with humanitarian projects, building up the profession’s presence and experience in the sector.

TESTING IDEAS WITH PROFESSIONALS

At the conclusion of my initial investigation into humanitarian design I had a number of conversations with established professionals all with substantial knowledge and experience in the field: Dr Estella Carpi, a research associate at the Bartlett’s Development Planning Unit; Dima Zogheib, a senior landscape architect at Arup and Siddharth Nadkarny, a senior consultant (urban design) in international development also at Arup. Dr Carpi has conducted extensive research in humanitarianism, the politics of aid provision, how societies respond to crises, and crisis management (among others) – with a specific focus on the Arab Levant and Turkey. Dima Zogheib has an interest in how landscape architects can contribute to the liveability of cities as well as their resilience and sustainability. She has conducted research on the role landscape can play in helping communities that live in informal settlements. Siddharth Nadkarny’s work includes projects in informal settlements – having previously worked on the ground in informal settlements such as Dharavi, Mumbai.

Discussion ranged over many topics and definitions. The contentious word slum could equally describe “an amazing 20-bedroom mansion built in the 1900s ... [without] the right infrastructure or housing standards”. Further the notion of refugees is a politically sensitive one with them being seen as “temporary people and countries don’t want to integrate them into their formal system”. The term ‘vulnerable country’ might not apply to places such as India and the US which could be considered ‘stable’ countries.

Regarding landscape architecture’s current role, all my contacts described it as being seen as a ‘profession’, sometimes particularly “to make things beautiful” (Zogheib, 2017). But this ‘professional’ perception could be a problem due to the financial ‘baggage’ associated with it: “NGOs are not going to pay a big company, or a big landscape firm to do a design for a refugee camp. The same in squatter settlements, unless there’s a bid fund to upgrade them then I can’t see how a landscape firm can be appointed” on the subject of work currently being done by volunteers or NGOs. Dr Carpi also didn’t feel like there was much of a landscape architecture presence within the international humanitarianism field, but felt that NGOs should hire people with their expertise (2017). With regards to slums, landscape

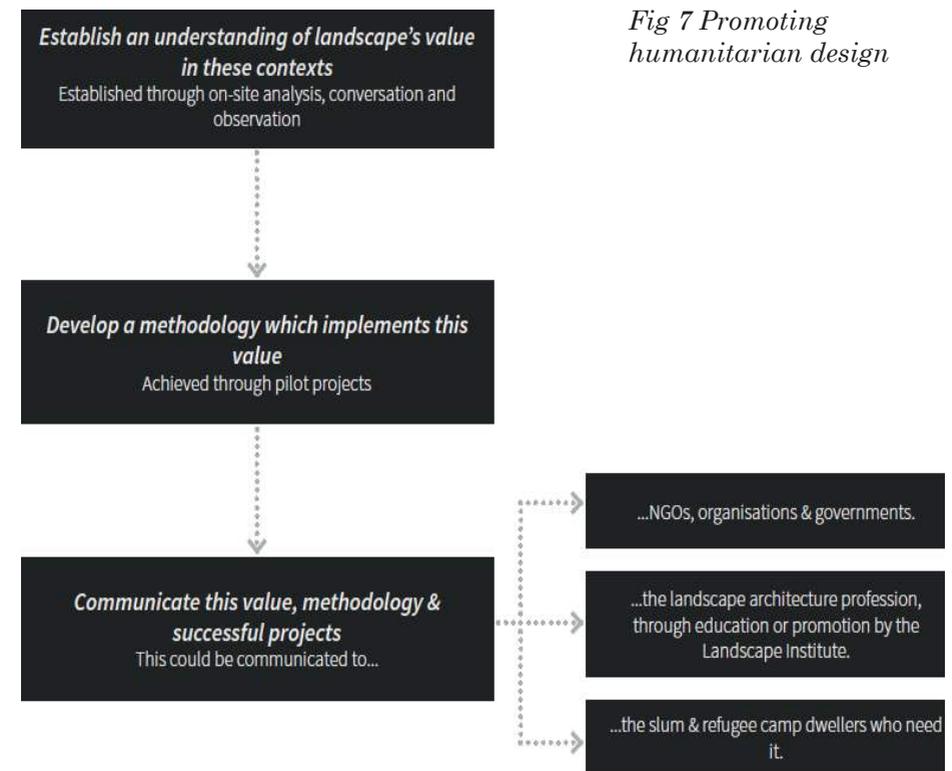


Fig 7 Promoting humanitarian design

architects tend to have an ‘on-the-ground’ role; talking to the community and being involved with the participatory design process (Nadkarny et al).

In the case of slums, landscape can have the purpose of giving legitimacy to the ownership of an area, “a way to put your mark on the land so that nobody comes and builds on it” (ibid). They used the example of the simple communal-water tap, which, as a recreational space, fulfils “an infrastructural need but [is] going to be protected as an open space because you know you have to queue up to fill your bucket” (ibid). The only way to learn these values and typologies is to be on the ground, speaking to the residents and appreciating the complexities of the context. Once these are understood, a methodology can be developed and tested through projects – the success of which can be communicated with others (Nadkarny, op cit).

Following these productive conversations, I have revised my original four action points on how to promote the role of landscape architects in humanitarian design and they are set out above (fig 7). While the best practice guide established earlier answers this paper’s initial question, *what design methodology can landscape architects use to improve the living conditions of refugee camps and slums?* to deal with issues in specific settlements or camps, the landscape architecture profession must begin by conducting ‘on-the-ground’ research to determine what value they have to give. This would provide them with the platform to find their role in the humanitarian sector, becoming part of the UN’s concerted urbanisation efforts. Personally, after completing my study I would like to become a part of this research effort – in what context I do not know, but that’s a topic for another paper...

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Biographical notes

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SEEING LANDSCAPES IN GRAINS OF SAND

Martin Spray

"There might perhaps be insects; something in the way of ants for example; something that is able to hide in deep burrows from the lunar night. Or some new sort of creatures having no earthly parallel." [1]

SPACE BECOMES PLACE

"Places become meaningful when there is a story", says environmentalist Jules Pretty; and in *Ecologies of the heart* E.N. Anderson discusses the roles of myths and folktales in the transmission of environmental information. Anderson notes that, for instance, in both Australia and California stories "function as, among other things, devices to teach the young about the environment. [Native Australian] children learn myths that include the travels of culture heroes around the water-holes in the territory. For these desert people, [...] a list of water holes is a great deal easier to memorize if it is embedded in a racy story with lots of sex, violence, and religion." [2]

Perhaps there has always been a general rule that when we meet something new we interpret it as if it was something familiar. A classic example is the buildings and structures 'seen' when early telescopes were pointed at Moon. Sensible – scientific – moonwatchers 'saw' roads, canals, temples... [3] Here on Earth, the buildings and land-shaping of exotic cultures, when first met by Europeans, were sometimes misunderstood. Whole landscapes have been misunderstood – perhaps still are, and perhaps deliberately. If we deem the people primitive, we are inclined to deem their home 'wilderness', and the 'natives' themselves can then be treated as a component of the wild fauna. [4]

Something or somewhere little-known, such as Moon in 1900, or little-understood, such as the huge American earthworks, might safely develop around it a fictional interpretation embellished with fantasy, or a fanciful interpretive fiction. After all, we are supposed to enjoy a good tale with a strong exaggeration. Having not been to or having a misunderstanding of a place still enables us to enjoy its 'story' – or, rather, stories. A story may or may not be 'true'; a scientific 'truth' may be discarded tomorrow; and political 'truths' seldom are.

Landscapes (a rather nebulous idea, but primarily visual things in our context) are not only geographic and/or ecological zones, or economic or aesthetic ones. They are also 'texts' for the stories spun for them. These

stories sometimes can be just as ‘real’ as the descriptions of the topographies, ecosystems, etc. that make up the landscapes. Indeed, such a landscape-as-story may not be considered separable into the two parts that our culture sees.

The examples of landscape-as-story most familiar (but still only slightly so) to many in the West are the ‘songlines’ of native Australians, which allow initiates to develop detailed mental ‘maps’ of their territories. We have only faint echoes of this sort of thing: for example, readers of the Welsh *Mabinogion* wonder tales [5] can (I’m told) still follow some of the action on the ground. Place-names, as in Welsh much more than in modern English, may aid the process. Even amongst modern English: place-names, we have many cases where we know that Ippa or Beorna or Alf “did it” – but what it was they did, we haven’t a clue!

STIRRED IMAGININGS

A few years ago, Nobel physicist Gerd Binnig looked at silica in a scanning tunnelling microscope, and described what he saw: “little hills, and the hills formed a complicated pattern”. [6] But generally professionals and academics are wary of such language, and tend not to tell stories. Humour in their work is not usually superabundant. [7] Such serious folk have put play aside... or, if you agree with Johan Huizinga that we are *Homo ludens*, the ape that plays, think they have, but really *haven’t*. Could it be that (to use psychologist Donald Winnicott’s title) we have tried too hard to separate playing and ‘reality’? [8] Has studying and describing, and designing, such rather nebulous things as landscape drawn us too far into the scientific discourse?

I think it has. *Of course* there is a legitimate – if ‘soft’ – science of landscape (parts of geography / geology / ecology / etc., if you wish); and although science is a bringer of wonders, even from those who “rin up hill and down dale knapping the chunky stanes to pieces wi’ hammers like sae many road makers run daft” to see “how the world was made” [9], and although it has in some crucial respects developed a highly efficient ‘objective’ [10] language in which to record its findings, these findings (which may be discarded when further evidence arrives) can seem inscrutable, and most of us need, as it were, a translation into, if not actual poetry [11], more-poetic rationales that let us (for instance) see “How once these heavy stones / Swam in the sea as shells and bones”. [12] There is a danger that “science without storytelling collapses to a set of equations or a ledger full of data” – which may be of immense value to experts, but brings no enlightenment to the rest of us. [13]

This is not a call for us to be irrational, or to treat serious matters as mere games. We tend to associate scientific explanations with ‘truth’ – although it is having to be admitted that nowadays a truth is a very hard thing to find; indeed, it may be more sensible to see that there are several valid –

and complementary – ways of investigating, describing and explaining the world, and that science is only one of them. Again, this is not suggesting that landscape architects (or others) should abandon the ‘objective’ approach – rather that we might appreciate and make use of several ways of “seeing the world” (or just a site), and that painting, sculpture, dance, music, poetics, and sober prose, all have (as it were) something to tell – as have story-making fantasy, even our dreams. [14]

I am merely suggesting that a mixing of so-called objective and so-called subjective interpretations of the world (I am resisting calling the latter ‘creative’ or ‘artistic or ‘internal’ etc.) approaches can be more insightful than relying on just one – if only by allowing us a more imag[in]nov[ative] vocabulary. Walking on two legs is – after all – usually better than hopping along on one. [15]

LANDSCAPE ARCHITECTURE

For a designer of landscape, such a cooperative combination (if not quite a combination of “self-transcending absorption in the riddles of nature” and “speculations about the Mysteries of Nature”) would seem to have benefits.

When I left a botany research lab and started teaching in an Art & Design college (later absorbed into the University of Gloucestershire), I was recommended to read a now seldom mentioned book: Arthur Koestler’s *The act of creation*, from where the above characterisations are taken. [16] Koestler proposed that all creative activities – “scientific discovery, artistic originality, and comic inspiration” – share a basic pattern, which as it progresses may reach a point “signalled by a gross physiological reflex”: a burst of laughter – an understanding.

Years later, I remembered something of Koestler, when faced with a need to develop an ‘ice-breaker’ preface to some of the modules I taught. Whether or not the exercise gave participants any lasting benefit, I do not know, although immediate feedback was encouraging, and I think it helped some of them go into the deep ends of their imaginations – depths often left undisturbed. Unfortunately the modules were not parts of the landscape design area, but, I think such an exercise could have a place there. It worked well as an ice-breaker, and gave some slight experience in appropriate description and rationale.

A simpler version of the exercise has been used successfully with London primary school children.

What other, and more successful, exercises might be – or indeed have been – developed that work in this way, I have not explored: I guess there are several; but, for what it is worth, what I offered is as follows.

STORIES & STONES

The Senecas, a native people of north-east North America, say that it was the stories told by a speaking stone that gave them all the knowledge they have of the world before this one. Presumably their stone was an Iroquois speaker. I note that stones, like people, have language limitations. *“Rhaid edel Cymry i dorri'r garreg, nid yw'r graig yn deall Saesneg”*, said the Welsh slate-quarrymen: “You must get Welshmen to cut the stone, the rock does not understand English.” [17] I, unfortunately, have no experience of stones understanding what is said to them, let alone of them saying anything, but I have sometimes found them useful for fostering conversation between humans.

My interest in stones and stories was in their potential as prompts for students beginning some of the courses I taught. They were mostly environmental students in a broad sense, studying such things as geography, community development, and a few landscape architecture. It seemed fair to (gently) disorient students at the outset, to try to get them talking to each-other, and to ‘loosen up’ their thinking by using puzzling if attractive objects, and changing the exercise’s instructions partway through.

Of course, I may well have confused them by inadequacies in my teaching. Even so, and although some colleagues were sceptical, the suggestion of doing something – with humour – to disinhibit students’ minds and tongues before starting the module proper struck me as a good one. It has been suggested that adding a little humour “builds group cohesion. People respond more positively to each other”, and stress is reduced. [18] I was fortunate to have relatively small classes, which made this a convenient, not overlong, exercise, which was supposed to take rather less than an hour.



THE EXERCISE

The class got into pairs, and each pair was given a paper-bag, and was told to examine its contents – clearly a piece of rock. After a few minutes, the students were given ‘correct’ instructions. The following is a summary. Some directions were given orally

EACH BAG CONTAINS A STONE. But these are special stones. They are ‘natural models’ of areas of land. They are not necessarily showing their landscapes’ natural colours. You will have to decide if the edge of the stone represents the edge of the land or is the boundary of the model. I shall come round to see that you have your stone the right way up!

Look carefully at your model. Discuss what comes to mind about the land it represents for about fifteen minutes, and then be prepared to tell the rest of us about your land.... The ‘story’ you tell about it should be as rational, logical, and coherent as possible. The presentation plus a few questions should take about five minutes.

- > How big is the land the model represents?
- > What are the main characteristics of its physical environment?
- > What, if anything, lives / grows there?
- > Is this land influenced by humans?
- > Does or could this land sustain them?
- > Do people live there?
- > What – if anything – do they do there?
- > What do you think it is like to be there?
- > Would you like to take a holiday there?
- > Would you, if you could, like to live there?
- > Describe a journey from A to B, where A and B are as far apart as possible.
- > By the way... where in the universe is it...?

It was usually on Earth. It was usually some kilometres long, but the stories told of lands ranging from hundreds of kilometres down to a few metres across. It could be urban, rural, or wilderness; clothed in luxuriant foliage, or a desert – natural or manmade. It was sometimes a horrid place, but more often a pleasant one – worth considering for a vacation. In a few cases, it was extra-terrestrial, and very occasionally in another universe.

Between them, the stones showed quite a diversity of shape, texture, pattern, and colour. They were interpreted in an interesting diversity of ways – and nearly always the story told by the pair of students was fairly logical and reasonably realistic. Not unexpectedly, some pairs couldn't agree on a story – so they told two.... However, I don't recall anyone being fazed by the exercise, though it was clearly beyond their experience.

THE STONES

All the stones in the paper bags (I had a selection of about twenty) were chosen to be relatively easy to spin stories about. They were mostly hand-sized, and all had what I thought were interesting features. All were picked up in various parts of Britain, and they were used as found, after washing. Most were naked, but two supported encrusting lichens. Examples are: a piece of purple slate from Gwynedd, with an intense criss-crossing of grey lines; a flat buff and warty piece of oolitic limestone from the Cotswolds; and a piece of Forest of Dean sandstone that had a pock-marked surface. Perhaps the most distinctive stone was an almost spherical 'cannonball' fifteen centimetres in diameter, that fell out of the sea-cliff near Whitby.



The 'cannonball' was – predictably – seen as a very large object, usually a planet, sometimes Moon because of its partly pitted surface, and it was sometimes thought a rather inhospitable place. The pocked sandstone tended to be interpreted as an area of pools, perhaps resulting from quarrying, or from carpet-bombing – or alternatively as a heavily cratered part of Moon.

Reaction to the North Wales slate was interesting. Several pairs saw the lines as a road network, and the landscape, some kilometres across, was either urban or agriculturally rural. They were also seen as boundaries of small fields, the smaller 'enclosures' being cultivated, the larger ones pasture. In fact, this stone generated stories of field patterns, city blocks, road networks, Nazca lines, and land-artist Richard Long gone wild!

Size was also ambiguous in the case of a square of Scottish seashore rock covered in lichens – appropriately, mostly the 'map lichen', *Rhizocarpon geographicum*. The landscape seen here was either very small-scale, for instance plants in a part of a well-stocked garden, or larger scale, with individual lichen growths seen as – usually – natural vegetation patches, or perhaps crop areas with natural vegetation interspersed. It once became a coral reef. This stone's story was usually a happy one, told enthusiastically: of course the stone itself, I admit, was a bit of a cheat, 'softened' as it was by colourful, distinctly edged lichens. Our class conversation was especially effective when members of a pair saw very different landscapes, as in this case.

THE STORIES

I asked for descriptions and rationales to be as 'realistic' as possible. 'Story' may have been a rather poetic term for these, but everybody seemed to find words suitable for the task. They were usually very sensible.

I sought a show of twenty-first century imagination, not (say) the imagination of early archaeologists, who made rather off-beam interpretations of henges, dolmens, and other things being (re)discovered; nor, at the scale of the minute, the seventeenth century imagination of Antonie van Leeuwenhoek, who looked down his early microscope at a grain of sand, and drew what he saw: “a ruined Temple [...] and two images of humane shape, kneeling and extending their arms to an Altar”. [19]

Of course, there are ‘ways of telling’ besides story-making. What more important function could *art* have?... [20] Given the time constraints, and the types of students, asking for a story seemed fair; asking for a sculpture, painting, song, or dance sequence was not. However, with a different exercise for a module with fine art students, I was able to ask for art – paintings, drawings, sculpture, occasionally a poem – and these were often presented with ‘stories’ to interpret them.

A ROAD LESS TRAVELLED BY [21]

As ecology tutor to landscape architecture students in an Art & Design college (an interesting combination), I shared grumbles with a design colleague with whom I interviewed prospective students. These were mostly at the A-level stage, when, for many, ‘education’ had wilted both imagination and conversation. Their thoughts tended to be kept within close horizons. It was partly as if they were developing the problem that Zen writer Shunryu Suzuki sums up so neatly: “In the beginner’s mind there are many possibilities. In the expert’s mind there are few.” [22]

I am not the first teacher to believe that some of the most interesting ideas (*not necessarily feasible ones*) come from the junior end of education. Can we put some possibilities back? Can we keep the grown-up’s straighter thinking while reawakening the inner child’s off-the-leash wonderment? I am always saddened when I remember how narrowed-down we become; how we lose the ability – and the wish – to explore new and different roads, but grow up like the child who once could “read the bark of trees, / leaf veins, / seashell-convolutions, / footprints, / and the touch of fingers,” but who now “goes to school, / and he can only read / words.” [23] Striding confidently onwards, as it were, without looking into tracks that take you away from the straight-and-narrow, is not always the best way to approach a problem. “*Pour inventir il faut penser à côté.*” It has occurred to not a few people that kids are innocent de Bonos, their thoughts always jumping sideways, making connections that grown-ups just don’t get. I don’t know its source, but a quotation I happened on gives me encouragement: “*Le storytelling permet de penser à côté.... Quelle sont les histoires qui changent une vie?*” [24]

“If only”, said my designer friend, “we could recruit straight from the primary schools!” [25]

Notes and References

- 1 H.G. Wells (1900-01) *The first men in the moon*.
- 2 Jules Pretty (2007) *The Earth only endures. On reconnecting with nature and our place in it*, Earthscan. E.N. Anderson (1996) *Ecologies of the heart. Emotion, belief and the environment*, Oxford University Press.
- 3 ... even animals. Samuel Butler lampooned Royal Society members in his long poem *Hudibras* (1662-1678): “Have we not lately, in the moon, / Found a new world, to th’ old unknown? / / Made mountains with our tubes appear, / And cattle grazing on ’em there?”
- 4 E.g. Clive Gamble (1986) The artificial wilderness *New Scientist* 10 April 50-54 (Australia); Fred Pearce (2000) Inventing Africa *New Scientist* 12 August: 30-33.
- 5 *The Mabinogion*, e.g. the translation by G. & T. Jones, Everyman edition, Dent.
- 6 In Martin Kemp (2000) *Visualizations. The Nature book of art and science*. Oxford University Press. (Gerd’s surname is also given as ‘Binning’.)
- 7 Maryellen Weimer, Humor in the classroom: 40 years of research, *Faculty Focus* 1 February 2013, online, is a useful start to looking into this subject. As part of the botany course for landscape students, I had earlier used an exercise to explore plant anatomy and physiology, by criticising and updating an eighteenth century text: M. Spray (1981) Making the past serve the present *Journal of biological education* 15(1) 51-56.
- 8 J. Huizinga (1944, 1955) *Homo ludens. A study of the play element in culture*. Beacon Press, Boston. D.W. Winnicott (1971) *Playing and reality*. Later edition by Penguin.
- 9 Walter Scott (1824) *St. Ronan’s well*.
- 10 ‘Objectivity’ and its opposite are common terms in this context. It has been suggested that objectivity is the taking into consideration of only what is relevant in a given situation. But who decides what isn’t relevant and is left blank?
- 11 Poetry doesn’t ‘work’ for everyone. Overheard after a countryside conference, when one delegate asked another what he thought of it: “It was okay – until the poetry started...!” Nonetheless, some people think it helps a little to ease the “bewilderment of our intelligence by language”, to quote Wittgenstein; and its use is spreading in interesting ways. E.g. “Poetry is communicative of the quality of things [...] a tool for comprehending what cannot be known totally.” (A. Wittbecker, Forestry as poetic activity *Ecoforestry* 14(4), online 2003).

12 Andrew Young, 'Idleness' (1960) *Collected poems*.

13 "Scientific truth is sometimes best revealed in fiction" is the gist of Janna Levin (2006) *The truth of lies* *New Scientist* 10 August: 64-65. It should be noted that 'science' usually means the practice developed in Europe from the work of e.g. Francis Bacon; but there are varieties, and alternative practices. An interesting and unusual example is the paper by Isis Brook (1998) *Goethean science as a way to read landscape* *Landscape Research* 23(1) 51-69.

14 Dreams have long been considered sources of information, and to 'indicate' solutions to problems that resist wakeful thinking. 'Creative dreams' have (it is said) given inspiration to many artists, scientists, philosophers, etc..

15 M. Spray (2005) *Using both legs*. www.greenmuseum.org/; (2015) *Nature and two legs* *Ecos* 36(3-4) 48-52.

16 Arthur Koestler (1964) *The act of creation*, Hutchinson. His chapter 4, From humour to discovery, although modern neuropsychology doubtless has a different view, still seems to have useful ideas.

17 Susan Feldman (ed.) (1965) *The storytelling stone. Myths and tales of the American Indian*, Dell Publishing, N.Y.. Jan Morris (1998) *Wales. Epic views of a small country*, Viking.

18 See ref. 7.

19 Things antiquarian are well illustrated in John Michell (1982) *Megalithomania. Artists and antiquarians of the old stone monuments.*, Thames & Hudson. Michael Welland includes the van Leeuwenhoek drawing from the *Philosophical Transactions of the Royal Society* 1703 in *Sand. A journey through science and the imagination*, Oxford University Press (2009).

20 There are several ways into this subject. I found e.g. the following helpful: Suzi Gablik (1995) *Conversations before the end of time*, Thames & Hudson; Ellen Dissanayake (1992) *Homo aestheticus. Where art comes from and why*, Free Press (Macmillan) N.Y.; John Lane (1996) *A snake's tail full of ants*, Resurgence.

21 After Robert Frost, 'The road not taken'. "I took the one less traveled by, / And that has made all the difference."

22 Shunryu Suzuki (1970) *Zen mind, beginner's mind*, Weatherhill, N.Y..

23 I have quoted from this little poem by Jennifer Farley several times, as it seems so apposite, but I do not know where it was published.

24 Very freely translated: "To innovate, think sideways." "Telling stories lets you think askant. What stories changed your life?" I think the first quotation is from French aesthetics philosopher Étienne Souriau (1892-1979), though it is commonly quoted as by Einstein. While trying to check that, I found the comment on *le storytelling*. Edward de Bono popularised his term 'lateral thinking' in the book of that name (Harper & Row, 1970).

25 I have been grateful on several occasions to Alan Pinder, for encouraging the (careful) disorientation of students. I am grateful to several students for their inspiring reactions.

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Biographical notes

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DISCOVERING A CALLING FOR LANDSCAPE ARCHITECTURE

Bodfan Gruffydd

This is a transcript of a chapter from a draft autobiography which was never published. The typescript was in the possession of John Simpson, former colleague of the Cheltenham School of Landscape Architecture and partner to the Bodfan Gruffydd practice at Malvern. When it came into my possession, I felt there was something special here describing the life and times early last century of someone who was to rise in the profession to President of the Institute of Landscape Architects. It has only been slightly abridged and it is hoped other chapters will see light of day in the future. If there is a moral to this extract, it is that to succeed in any profession you need to be single-minded, something that Bodfan clearly was. He later went on to establish the first undergraduate landscape architecture course in Britain in 1961, in Cheltenham. He died in 2004. [Ed]

By this time in 1919, I was nine but I still could not read properly and went to the kindergarten where we seemed to play all morning and dance and do ear training in the afternoon. I could not sing in tune but loved beating time with drums and cymbals. When at twelve I went to junior school, it was a great shock and I failed all the exams. I was fine at playing hockey but somehow I could not follow the ball at cricket. My parents were in despair of ever getting me educated when my form master, apparently believing me not to be stupid, suggested having a look at my IQ. On the strength of this, I scraped into Uppingham. I had to swot Latin before going and entered the bottom form. I still failed exams, in fact I cannot remember ever passing an exam in my life. I do not remember any bullying, but I found the discipline and fagging irksome. Boys fagged for the first two years at school during which time they were at the beck and call of the praepostors, selected senior boys. After that they became non-fags and felt rather privileged. Every now and then, I just revolted against doing something the reason for which was not apparent and which I thought stupid. Then I was beaten, which did not seem to matter either.

I enjoyed games every afternoon and, in my third year, it was suddenly discovered that I could hook in the rugby-football scrum. I promptly shot up to the fourth game and I was moved up the school in spite of failing examinations which I therefore concluded were not important anyway. I found that to do something well commanded its own respect. By this time too, the strict discipline had taught me to understand about the importance of self-discipline and then, of course, I discovered that our society functions on self-discipline and that knowledge made life much easier.

We had a French master who taught by the direct method, that is without speaking any English and with a looking-glass to teach us to mouth the vowels correctly. His teaching was great fun. I found French and Latin much easier than English, Latin being more logical in spelling; it's like Welsh. He lived in a long low house and, if very lucky, one would be invited to breakfast on Sunday. This afforded the opportunity to gloat over his acetylene gas plant. Not only was the whole house lighted with fish-tail burners which gave a lovely light but he had a desk lamp in his study where there was also an acetylene gas fire as in all the bedrooms and even an acetylene gas stove in the kitchen. All this was powered by a marvellous machine in a little house all to itself. Carbide was fed by a paternoster wheel into a vessel into which water dripped, the resultant gas being stored in a miniature gasholder. The whole apparatus was made entirely of brass and looked very smart. A clockwork mechanism had to be wound up every day to keep it going and I would dearly have loved to look after it.

By this time my parents were wondering what career could possibly be found for backward me who only seemed to be able to play rigger and mend fuses. One great-uncle said I should be a lawyer because I argued about everything, another that I should follow medicine, the profession of all my other uncles while I, of course, wanted to be an engine driver. I did actually stoke an engine going to Holyhead during the great General Strike in 1926 but only got as far as Llanfair PG (Llanfairpwllgwyngyllgogerychwyrndrobwlllantysiliogogoch) because, after stopping there, a man wearing spats and wash-leather gloves, who came to drive the engine on to Holyhead, could only make it go backwards. I remember my mother saying, 'Lawyers make their living out of other people's quarrels, I'm sure you would not like to be a lawyer' and 'doctors make their living out of other people's sickness, I'm sure you would not like to be a doctor'. So the problem remained unsolved until fear of an infantile paralysis epidemic at school sent us all home at the beginning of a school term. We were all put in quarantine and I stayed with my aunt on her farm. My mother came along one day with a pamphlet extolling the desirabilities of landscape architecture and would I not like to have some 'work experience' to fill up the remaining period of the non-school term? By way of exciting interest, I had already been taken by Sir Albert Richardson around his architectural studio and Herbert North had shown me many of his local buildings now, alas, destroyed. I suppose that this landscape architecture, for which there was no formal training, seemed the perfect answer for those who could not pass examinations, though, in retrospect, I realise that all these moves showed considerable perspicacity on the part of my mother. At all events, I went to stay with Thomas Mawson, the premier landscape architect and town planner since the turn of the century, at Lancaster to see what I thought.

I was enamoured and, instead of going back to school, at sixteen became an articulated pupil (an apprenticeship) to the firm Mawson and Sons. The studios were at High Street House, Lancaster, and a new world opened

up before me. With other pupils I learnt to survey with a dumpy level, to draw the classical orders and to design marvellous imaginary gardens and parks; I actually worked on Sefton Park, Blackpool, and on TH Mawson's autobiography. We went to art school to draw from the cast and we went botanising in the Lake District. At Barwick Hall, the Fuller-Maitlands were particularly kind to me. There were lead peacocks in the garden and two organs in the music room. I was allowed to blow while my host, sometime music critic for *The Times*, played Bach. He gave me a copy of C Sandford Terry's Bach B Minor Mass which was a bit above my head, but it was a stimulating introduction to classical music.

Presently a new pupil arrived. He had followed the three year course at the Royal Horticultural Society's gardens at Wisley and persuaded me of the absolute need to do horticulture without delay. So, off I went to Wisley to be confronted by a prophecy which invoked strange feelings. Some time before I had ever thought of going to Wisley, an intelligent lady at a friend's wedding had read my palm and told me, 'You will go on a journey to a gabled building amidst pine trees', and here was a beautiful example of Lutyensesque architecture with a Jekyll garden in the pine woods of Surrey. There was no bothy for the students so I lodged in the village.

We attended lectures in the morning and practical work in the gardens or analytical work in the laboratories in the afternoon. It was a very good training. We were taught how to dig, trench, sow and reap, to take cuttings, to bud, graft and prune, how to manage greenhouses, to maintain the rock garden laid out by Reginald Farrar, the noted plant hunter and inspirer of rock gardening, and the wild garden inspired by Gertrude Jekyll, the pioneer of wild gardening, who with Edwin Lutyens also created magnificent twentieth century gardens; and, of course, we learnt about plants. As time went on, however, I learnt that the final year of the course was devoted to such things as arranging exhibits for the fortnightly shows at Vincent Square which did not greatly appeal. (In addition to the Chelsea Flower Show and the Autumn Show, the Royal Horticultural Society holds fortnightly shows at Vincent Square.) I came to the conclusion that I had learnt what I needed to know about horticulture. It was time to go back to Mawson to complete the design training which was what interested me most. To my consternation, I discovered that I had been signed on for the full three years and the only way to leave was to be expelled. It is difficult to be expelled to order. I started a night-club to liven things up; I pleaded with the Director, all to no avail. In the end, one afternoon, we were to set out a runner bean trial and were told to put three seeds in each hole. I asked the instructor, 'Why three seeds, why not two or four?' He said 'That is the trial', and would not give any rational explanation. So I went through the afternoon, but I sowed different numbers of seeds in the holes. At the end of the afternoon, I went back to the instructor and told him, because he would not tell me why the trial was arranged that way, I had used my own discretion as to how many seeds to sow in each hole. There was a hell of a row, and I was expelled.

I went to Mawson's London office, being nearer where his son, Jack supervised my further pupilage. Whenever I felt particularly hungry, I went to see my Uncle Jim who was living in the Strand Palace Hotel (Joe Lyons, very good value) because it was opposite Simpson's restaurant which he appreciated. He would take me across the road to that grand, mahogany panelled restaurant to choose sirloin of beef, saddle of mutton, duck or whatever from heated silver trolleys. The carver always got a separate shilling tip. Then I would be taken preferably to a sheep-dog film, very popular at the time, or to the dogs at the White City. He would give me a ten shilling note and tell me how to bet so that I always seemed to have five pounds at the end of the races. He also always gave me a pound of Black Magic chocolates to take home. I simply loved my Uncle Jim. By this time, however, I think my parents must have come to the conclusion that a spell abroad, roughing it, might not come amiss.

I was togged out in clothes suitable for farming and sailed to New Zealand, steerage, for twenty five pounds. The voyage normally took seven weeks, but approaching Panama, one of the engines broke down which provided an opportunity to explore the Canal. It was fascinating to see the exotic orchids growing on the old tree stumps left sticking above the waters when the canal was filled; and to witness the most spectacular sunsets ever seen, of emerald clouds floating in a rose-madder sky which left one speechless. We slept eight to a cabin, swabbed decks before breakfast every morning and flirted with the first class passengers in the afternoon. At Pitcairn, Fletcher Christian's descendants rowed out in small boats to trade shell necklaces and the tail feathers of a too beautiful native bird. Then we ran into a great Pacific storm with rollers forty feet high. The ship keeled over so far because the captain, for some inexplicable reason, did not steer into the waves and so the siren wire was caught in the billowing water which blew the siren. Everyone rushed on deck with lifebelts to say their prayers and we had a marvellous time comforting the charming panic-stricken ladies. The captain was presented with a gold watch for his stupidity.

Landing at Wellington, I was disappointed because, instead of wild countryside, there was a sophisticated city with chromium-plated cinemas, even showing talkies. I boarded a coaster and a few days later I was put ashore in the ship's boat which then rowed away and left me on the beach with my trunk. Thick native forest lined the shore, not 'bush' at all as its name implies, but composed of dense sub-tropical growth of trees, bushes and climbers, all more-or-less dependent on each other for their growth and development; a symbiotic relationship which it is extremely difficult for man to reproduce, rather like needing the right kind of bacteria for leguminous crops to grow. Presently the farmer for whom I had come to work, emerged from the bush with a horse for me to ride and a pack horse for my trunk. 'So, you are for me', he said. That was the moment and the beginning of a life of novelty and excitement.

The farmer and his wife were real pioneers. They had built a very nice

farmhouse bungalow for themselves with a garden surrounded by a passion-fruit hedge. There were peach and apricot trees, figs and tree tomatoes, as well as the more usual, to me, apples and pears. There were cultivated fields surrounding the farmhouse but these gave way to partially burnt-off bush where grass and wild white clover were encouraged by use of fertilisers. Beyond again was the native bush, a paradise of exotic climbers and living in close propinquity with Cape gooseberry and the ubiquitous blackberry, self-sown in the clearings, and at all times of the day hauntingly characterised by the plaintive, liquid call of the tui and the bell bird. The coastal inlets were lined with the blood-red blossoms of pohutukawa (*Metrocideros excelsa*) dipping in the water.

The cows lived outside all year round. We separated the milk to make butter with the cream while the skimmed milk flowed away to the pigs which grazed in the orchard where they enjoyed the windfalls, to become, in time, peach-fed hams.

Water was pumped by windmills and horses supplied the power. I learnt to plough, harrow, sow and to chop iron-hard rata wood (*Metrosideros robusta*) for the kitchen stove. We killed and cured our own pigs so that the family was virtually self-sufficient. One day, I thought I really must be drunk because the field I was harrowing suddenly developed great rollers which came swelling towards me, the horses bolted and I felt in a real whirl; it was an earthquake and very alarming. I had no idea the land could develop billows like the sea. The shelterbelts of blue gums (*Eucalyptus sp*) leaned over on their side and, as I passed a thousand gallon tank, I was drenched by water swishing over the side. The earthquake calmed down, without significant damage, unlike the one which I was later to experience.

We went everywhere on horseback, chasing wild pigs at weekends. The nearest passable road in wet weather was some miles away. One evening I was riding to a dance and woke up in a ditch, in agony. The horse had disappeared and I crawled back to the farmhouse, in and out of consciousness. I flopped onto the veranda and heard my hostess say, 'Robi, I think he's drunk', I was put to bed and then heard the telephone conversation with the doctor in the nearest town: 'Yes, doctor, you think it's appendicitis, doctor? Give him some brandy, doctor, yes . . .'. Black out.

The appendicitis was undoubtedly the result of lying under the passion fruit hedge on Sundays, reading Rider Haggard and guzzling passion fruit. I was strapped on the back of a pack-horse and led to the model T Ford which was kept on the usable road and driven some thirty miles to hospital over bumpy tracks. It was a large appendix, but it had not burst; quite a lucky non-break.

The convalescence was a lovely long holiday accompanying my uncle on his rounds, criss-crossing Hawke's Bay from coast to foothills. My aunt always drove the car, a large open Buick which had such a powerful engine, in

such flat country; it would start off and go to its destination in top gear. The hood was usually up to counter the clear heat and glare of the sun. The vast grazing areas stretched away in all directions to infinity, relieved by weeping willow trees, singly and in groups, which were planted as much for the value of their foliage to be cut down for the sheep to eat in periods of prolonged drought, as for their shade. It is unusual for rain to fall during the nine months over the summer period. The grass turns to hay in the heat, the sheep eat it standing, supplemented by artesian water rising up in bore-holes, occasionally assisted by windmills. Here and there a farmhouse would appear sheltered by plantations of eucalyptus with Lombardy poplars standing sentinel and large patches of vivid green lucerne, the roots of which have been traced down 75 feet to artesian water, as a forage crop. The coast has wide bays, backed by sand dunes, with great Pacific rollers curving in a continuous crescent to break on the sandy shore, their spume flying as a thousand horses' manes, on the off-shore breeze. Hawke's Bay really has an idyllic climate, but the day came to go back to the farm and I enjoyed it slightly less.

Not so many months passed, however, before Jack Mawson under whom I had studied as an articled pupil in the London office of Thomas Mawson and Son, came out to New Zealand as Director of Town Planning. It was a first appointment to that post. Somehow he knew where I was and wanted an assistant who knew something about town planning and could draw plans. He asked me to join him. That brought to an end two years on the land when I went south to 'wet and windy' Wellington. These two years of somewhat roughing it on the land on a broader than horticultural scale must have been very helpful to my understanding of man's attachment to the land, of his understanding of nature's ways and the poetry of its changing seasons. I learnt how flexible one must be to fit in with the unpredictability of natural events and I was certainly humbled by their magnitude.

Back in Wellington once more, I spent the first two months in the Parliamentary Library, learning about filing and the classification of books. Then I became the three person office's general dog's body. It was all very new and I learnt a lot. I even reviewed books. I also took a degree course in economics and statistical method at Victoria University, presumably for their relevance to town-planning and, for pleasure, I also followed a course in drawing from the nude. Though reputed to be wet and windy, Wellington, like all New Zealand, had for me a delightful climate where the sun shone whenever it was not raining. There was good swimming in the magnificent harbour and surfing on the more open coast. There were congenial companions of the same age to share a carefree and happy existence.

Another visit to Hawke's Bay does not have such happy memories. I was undertaking an errand one morning to the top floor of the only tower office block in Wellington when suddenly the building swayed and rocked in an earthquake. The windows rattled and every piece of furniture not anchored to the floor, careered from wall to wall. It went on for minutes and we all

clung to the columns supporting the ceiling and hoped for the best. As soon as I heard that the epicentre was in Hawke's Bay, I collected brandy and other things I thought might be useful and set off during the night for Hastings, hoping all was well with my aunt and uncle, there being no telephonic communication.

I found all the chimneys had fallen through the roof of their bungalow and the pantry was a foot deep in smashed bottles of fruit and jam. Everyone was living out-of-doors and the tennis lawn was covered with camp beds for wounded people who were brought in in a steady stream. We did what we could under my uncle's directions. I remember going to the artesian well for water only to find hot mud spouting up. It felt like living in a hot crucible, quite airless. Every now and then my uncle came along with one of the bottles of brandy in one hand and a tumbler in the other. He would half fill the tumbler and say, 'There, Johnny, my lad, drink that up, it will do you good'. It just steadied me.

That particular earthquake was very sudden in that usually slight tremors build up to a crescendo before dying down again. If quakes die gently, there is not too much damage. If they jolt to a stop, the chimneys come down. But this one was abnormal. It was simply a sharp upward thrust which shattered buildings, bridges and infrastructure on subsiding. My aunt was sitting in the car while her husband went into the post office which was in two sections on each side of an open porch. He was crossing the porch from the post boxes to the counters on the other side, when he heard, rather than felt, the earthquake and rushed out to the street as the solid concrete cornice fell from above, taking the hat off his head. This so shocked my aunt that they left Hawke's Bay for good.

After a couple of days when most of the casualties had been dealt with on a temporary basis, I went to Napier in search of news of friends and incidentally saw much of the damage. There were extraordinary contrasts. The hospital at Hastings was virtually undamaged because it was built on a concrete raft (a floating foundation) on the thick gravel of a former river bed whereas the brick built hospital founded on rock at Napier, on a hill above the harbour, collapsed like a house of cards. One looked down to the sea and the harbours. There was an outer harbour open to the sea and an inner separated from it by an embankment along which the railway ran. As one looked, the bed of the inner harbour rose and fell as though breathing, sending the water alternately to the sides and middle, while the outer harbour was practically dry and two warships at the quayside only held partially upright by no more than hemp ropes, the steel hawsers having snapped under the strain. The whole sea-front promenade, with its spectacular avenue of Norfolk Island pines, the most symmetrical trees on earth, was swept away by a tidal wave.

To compensate for terrestrial instability, New Zealand has perhaps the most beautiful climate, landscape and flora on earth; but the population is

not large enough to provide the variety of interest needed to create a culture to satisfy all tastes. At that time, there were two million English, Irish, Scots and Welsh and one million Maoris in a country slightly larger than Great Britain. With developments in travel and communication worldwide, this imbalance between land and people will correct itself in time, though New Zealanders oddly do not encourage it.

In the meantime my father had been working much too hard and was heading for a breakdown. He was recommended a long sea voyage as a rest cure and came out to see if I should not go home to finish my training. The parting was sad indeed. In fact, I thought the bottom had fallen out of the world, leaving so many friends, but we all went our different ways so one had to regard it as the end of a happy interlude for there was plenty more of life to follow. I made my way back to Wales via Australia, Ceylon (Sri Lanka) and the Suez Canal. There was only time to see the southern fringe of Australia, to see kaola bears in their native eucalyptus habitat, kangaroos loping across the desert landscape and a chance, by special permission, to pick wild flowers in Western Australia. They were weird and beautiful and I persuaded the ship's butcher to freeze them in a block of ice in a Huntley and Palmer's cubical biscuit tin. When I arrived at Tilbury, my mother's whole attention was on the flowers in their block of ice that her son would not melt, and the last I heard of them was dripping Australian water onto railway passengers' heads on the journey to Wales. They went into formalin in the University Botany Department at Bangor.

It was strange to sail along the Suez Canal with only the flatness of sand all round instead of the sea, as though sand or ice yachting and reminiscent, in a peculiarly reversed way, of sailing on the Norfolk Broads when the ships appear to be floating on the land. I left it for some extremely uncomfortable hours on the back of a camel to see the Sphinx and other tourist attractions. I arrived home with a terrible carbuncle and suffered many more during the following years. I tried everything, poultices of epsom salts and glycerine and everything I could think of – this was in the days before penicillin. The doctors said, 'eat more fruit, drink lots of orange juice'. I even ate ivy berries because a Cambridge Blue told me of their efficacy. When I was nearly demented, my clever uncle Jim, the one who went to India, diagnosed an allergy to acids and advised that I give up fruits and roughage. The carbuncles stopped like magic, like so many things which seem insurmountable in life but which are simple when once one knows about them.

Then re-arose the problem of completing my jumbled-up training. Reading Arnold Bennett's *Grand Hotel* on the voyage home, I was all for running a huge hotel, but I did not want office life and soon realised that my real attachment was to the land. I swatted for 'matric' which, of course, I failed. There was however an excellent diploma course in agriculture locally, at Bangor University College which did not require matriculation, so remembering happy days on my grandfather's farm and later in New Zealand, I decided, in 1932, to go for that. I was then 22 years old.

The three year course combined agricultural botany, chemistry and economics with entomology, forestry and zoology and comprised two winter terms at college with the summers working on a farm. We had excellent teachers, the agricultural and forestry departments were of world renown and, although I did not pass the exams, I was very conscious of the immense value of understanding the scientific way of thought I learnt there. It taught me how to think out solutions to problems based on ascertaining the precise facts of each problem separately, putting them together and making one's judgement accordingly. I discovered that no two problems are ever identical, that therefore no rule-of-thumb answers would serve. While investigating underlying causes and thinking forward from there, depending on the analytical methods mentioned, it was not necessary to refer to others or to books beyond the requirements of the technical considerations to find answers and very much quicker.

College was a happy time with opportunities for rugby football and hops on Saturday nights. Agricultural students visited the college farm regularly and there were other activities connected with butter and cheese making. I was shocked by the deplorable state of the dairy at the college farm which was excavated into the hillsides below the churchyard from which drainage appeared to seep down the back wall. I wrote a very critical letter to the local newspaper which got me into trouble with my professor who did not like the publicity, though, a few years later, I noticed the college had built a new dairy on higher ground.

It was at this time that I renewed a childhood friendship with a very upright old lady, quite three times my age; a friendship of the generation gap. Mary Rathbone was of a well-to-do Liverpool Quaker family and full of good works. She was on the College Council and moved from Llandegfan across the Straits to be nearer the University at Bangor because she was shocked by the muddled administration and the state of the kitchens. She supported the college financially and determined to keep a closer eye on things. I think she was thought an awful nuisance.

Miss Rathbone used to take us as children for a marvellous picnic. With travelling rugs and hampers, we set off from Bangor railway station to do the round trip via Llandudno Junction, up the Conway and Lledr Valleys to Blaenau Ffestiniog, thence to Porthmadog and home via Caernarfon to see the autumn colour, travelling all the way by train. This way we became familiar with the beauty and magnificence of much of Snowdonia beyond the northern range of mountains seen from our home. It was a real Edwardian treat. The old lady was very kind to me. I used to visit her regularly during school and college days and benefited from her vast store of wisdom. She used to say 'When you grow up, remember always to have some voluntary work to do. There is a quality attached to voluntary work which no other kind of work enjoys, for you have no personal axes to grind and so can fight fiercely for your principles'. She reinforced our parents' emphasis on the importance of principles in our upbringing. Later I found that if decisions are based on

principles it is not necessary to worry about what one said before because, so long as one thought back to the original problem, a similar conclusion would come up though I now realise that it is necessary to explain the steps which led to that conclusion in order to be convincing. Thus it was that from the college farm dairy fracas there developed a continuing series of battles against things I thought to be wrong. It rather naturally developed for me into a still active campaign for the protection of landscape amenity.

The first farming summer term was spent on a go-ahead poultry and dairy farm in East Lothian, Scotland. I camped very happily in a hen-run. It was a very superior hen-run being part of a larger hen-run which had a hen-house in the middle and individual runs fanning out from it for rotational grazing.

The second summer was spent on a mixed farm in Cornwall where the woods, sloping down to the river Fal, were carpeted with bluebells, red campion and hart's tongue fern and were exquisitely enlivened by the drumming of woodpeckers. It was a rewarding summer and I was further rewarded for my work by a camping holiday in the Scilly Isles from which I returned laden with cuttings of New Zealand plants which later survived many years in south Caernarfonshire until a freak frost polished them off. One of the jobs I was called to do however was to castrate piglets with a penknife without anaesthetic or any form of antiseptic, though great care was taken to sterilize the dairy utensils. I decided then and there that farming was not for me.

I still had the travel bug in my veins however and I suppose it will remain. At that time, Sweden was considered very advanced with its socialism, control of alcohol abuse and excellence in industrial design. So I went there for a final year to study fruit farming at the Horticultural College of Sweden in Skåna and thence to the Agricultural College of Sweden at Uppsala, a town which was the home of Karl von Linné, famous plant taxonomist. I lived with the professor of agriculture to help him with his English and to work on the farm. My work, however, was mostly in the laboratory on soil science and analysis, the mechanical analysis and determination of porosity, pH (lime), phosphate and nitrate which involved endless cellophane sausages, filled with liquid and strung all over the laboratory where they kept bursting. The results of this research were published by my professor in German, a language of which I know hardly a word. However it was necessary for me to learn some Swedish in order to communicate with my lab assistant who could not speak English with the result that, later when travelling through Norway on my way home to Wales, I was mistaken for a Dane.

The landscape of Sweden is not unattractive, open farmland in the south contrasting with coniferous forest interspersed with lakes further north. At the latitude of Uppsala frost descends in September and continues unabated until the following April when with a burst of hot weather forsythia and flowering currant flame into bloom beside ice-packs floating down the river.

As the snow melts in the woods, pools of blue *Anemone hepatica* appear and later there are carpets of lily-of-the-valley. But the onset of spring is painful rather than joyous. For all those long winter months, the landscape has been a monotonous black and white of conifer forests and snow relieved here and there only by the occasional red-painted farmstead. The sheer monotony of it makes people feel ill; 'Uppsala luft', Uppsala air, we used to call it. No wonder too much schnapps is consumed.

I left Sweden with mixed feelings to attend a practical course in market gardening at the local farm institute and, because fresh fruit and vegetables were not obtainable locally in Llyn (south Caernarfonshire) I started to grow them. I was caught in this activity when war broke out which determined my activities for the next decade. We used to dole out the very special second crop of tomatoes on children's Green Ration Cards to try to ensure they got their share of vitamins. In the end, after all that, I grew the best strawberries to be sold on Liverpool market.

Then quite serendipitously David Lloyd George asked me to design a garden in memory of his wife, Dame Margaret Lloyd George. It was inspired, I think, not only as a tribute to Dame Margaret who dearly loved her garden, but also as a counter concentration to assuage his daughter's grief. It seemed to me to work very well for Megan Lloyd George followed her mother's enthusiasm while for me it led to a happy friendship. Megan was very kind. I was suffering nervous exhaustion at the time. I had apparently been overworking and had to rest once or twice during the day. Megan had suffered in the same way and Lord Dawson of Penn had prescribed a course of Trollope as being sufficiently riveting to concentrate the mind without over-exciting it. My doctors made sympathetic noises but did not appear to know what was the matter with me, so Megan fed me Trollope and after six months, when I was obviously recovering, said, 'I think you can go on to Stanley Weyman now' and how right she and Lord Dawson were.

With the commission to design Dame Margaret's garden, my whole life turned full circle so that I could apply to landscape architecture and design all the various talents I had acquired over some twenty years. It was extraordinary how it all happened and how I suddenly realised that it was landscape itself and its design that really interested me and, as it turns out, what I came to do best.

Practice quite quickly developed. I worked with Colwyn Ffoulkes on some of his prize-winning schemes and with Clough William-Ellis on Lloyd George's garden and later grave at Llanstumdwy, Gwynedd. There were factory sites on coal tips in South Wales and miners' pithead baths, caravan sites and gardens medium and small. It involved travelling the length and breadth of Wales, exploring along the way, scrambling over mountains and swimming in icy lakes. There were other days spent seeing otters scurrying over the pass at Bwlch Drws Ardudwy, the Doorway to Ardudwy, buzzards flying overhead and one day, further to the south, the excitement of seeing the

first red kites. One spring day I went to the Nanhoven Valley in Llyn when honeysuckle spangled the nut bushes and carpets of bluebells covered the valley sides. I was amazed to see two peregrine falcons endeavouring to take off with a rabbit, each holding on to one end in a co-operative effort. But it was too much for them and they dropped the rabbit. To my astonishment, two more peregrines appeared, one caught the rabbit in mid-air and together they actually got away with it, presumably to their nestlings. That was on the way to Plas-yn-rhiw, near Aberdaron where the Misses Keating were restoring the house and buying coastland to give to the National Trust. They were a truly amazing trio and it was they who first involved me, among others, with the National Trust.

The illustration below shows Bodfan's hand-tinted design for Dame Margaret's garden in Criccieth, North Wales (former prime minister Lloyd George's wife).



A GIS EXPLORATION OF THE LANDSCAPE ASSOCIATED WITH JOHN DYER'S POEM *GRONGAR HILL*

Russell Mainwaring

*Grongar Hill invites my song,
Draw the landskip bright and strong:*

In *Grongar Hill*, written in 1726 by John Dyer (1701-1757), the poet describes a walk from his family home of Aberglasney to the top of neighbouring Grongar Hill, a distance of about 1km with a rise in height of about 170m. Grongar Hill was the site of an Iron Age hill fort of which the earth embankments survive. The top of Grongar is, as a result of this Iron Age remodelling, largely flat.

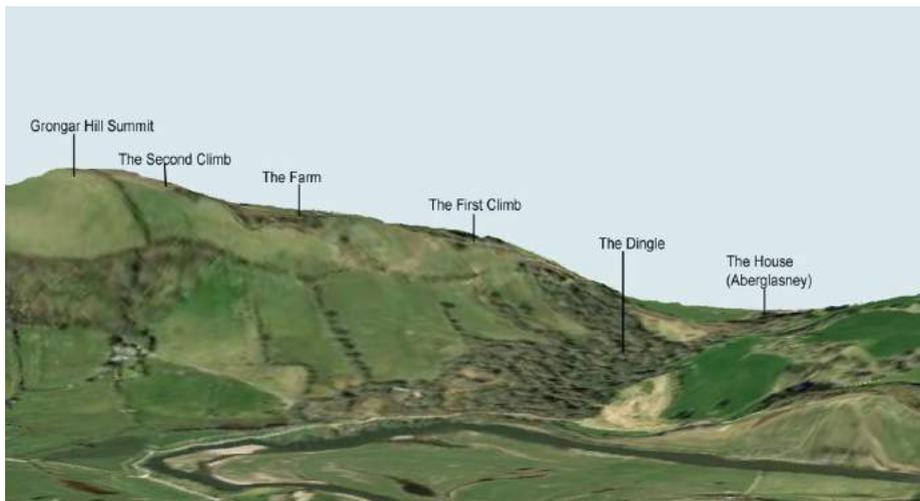


Fig 1: This 3D model of the site of the climb was produced using ESRI ArcScene (and Adobe Photoshop). I have indicated the position of viewshed analysis points. The terrain is vertically exaggerated.

The surrounding landscape is replete with sites of historical interest as the nearby Towy river is bordered to the north and south by areas of high land which were historically a refuge to the Welsh from the Romans to Cromwell's parliamentary forces. These areas of high land were also a launching point for attacks against invading armies. This resultant pinch point became a vital strategic position; whoever controlled this area also controlled a good section of mid Wales.

In the time that Dyer was writing *Wales* was about to enter what was to become a long period of political decline that has only probably begun to reverse in recent years with the introduction of the Welsh Assembly. For example, in the seventeenth century Golden Grove, the home of the Vaughan family, had been built in the valley bottom, on the opposite bank of the Towy from Grongar. By the beginning of the eighteenth century, when Dyer wrote *Grongar Hill*, the Vaughans were to spend most of their time in London and Golden Grove became not their seat of power but their country estate. The area became a picturesque rural backwater. The strategic relationship between the historical landmarks within the landscape of Dyer's poem was about to be forgotten.

Whilst poems such as Wordsworth's *I wandered lonely as a cloud* with its famous description of daffodils are associated with a place, in that case Ullswater, beyond the population of west Wales few realise that the landscape described by Dyer in *Grongar Hill* actually exists. In the description of the ascent Dyer records the revelation of landscape associated with that climb. In this study I will attempt to discover if Dyer's journey is, beyond its dreamy lyrics, a realistic topographical description.

Castles are key landmarks that have been associated with Dyer's *Grongar Hill*, demonstrated by the lines, *Old castles on the cliffs arise, Proudly*



Fig 2: Key features in the assessed landscape (based on Bing Maps)

towering in the skies! Dryslwyn Castle and Dinefwr Castle are the castles generally noted by academics as the ones associated with the poem but by the use of GIS I will demonstrate that another castle, Carreg Cennen, is one of a number of additional features that ‘arose’ from the cliffs.

I will use viewshed analysis from various points along the course of Dyer’s ascent of Grongar and I will consider the effect which is noted in the lines of the poem,

*The mountains round, unhappy fate!
Sooner or later, of all height,
Withdraw their summits from the skies,
And lessen as the others rise.*

Viewshed analysis refers to that technique undertaken in a geographical information system (GIS) whereby the visible land surface from a given observer point is calculated using a digital elevation model of the intervening terrain. Previously, intervisibility section lines were drawn by hand, but the digital equivalent is more accurate, speedier and geographically all-embracing and synoptic.

The Ascent of Grongar

In the present day a track links Aberglasney with Grongar Farm, from which it is a short distance to the summit. It is possible that this is the route that Dyer walked but it seems more likely that his route began from the pond, to the south of the house, which was present in his day, and went out into a wooded valley. This route seems much more in keeping with the spirit of the poem, which in the opening lines states,

*About his chequer’d sides I wind,
And leave his brooks and meads behind,
And groves, and grottoes where I lay,
And vistas shooting beams of day.*

Unfortunately it is no longer possible to visit the summit of Grongar Hill as the land is in private ownership and the present owners do not encourage visitors. As a result GIS represents the best way of assessing the landscape of the poem. Not only can GIS aid research into inaccessible historic landscapes but it also can reduce the time needed to assess such landscapes obviating the need to make a field visit. It can also throw up new points of interest that would probably not be revealed by any other form of assessment.

The gardens at Aberglasney have recently been restored and features familiar to Dyer are now visible.

Dyer begins the section of the poem that directly refers to the ascent with his memories of Grongar Hill:



Fig 3: The most direct route up Grongar Hill is shown as a solid line. The likely route of Dyer is shown dashed.

*So oft I have, the ev’ning still,
At the fountain of a rill
Sate upon a flow’ry bed,
With my hand beneath my head;
While stray’d my eyes o’er Towy’s flood,
Over mead, and over wood,
From house to house, from hill to hill,
’Till Contemplation had her fill.*

He begins his description of the ascent with key descriptive lines, which are the essence of the poem in topographical terms.

*Wide and wider spreads the vale;
As circles on a smooth canal:
The mountains round, unhappy fate!
Sooner or later, of all height,
Withdraw their summits from the skies,
And lessen as the others rise:
Still the prospect wider spreads,
Adds a thousand woods and meads,
Still it widens, widens still,
And sinks the newly-risen hill.*



Fig 4: Cloister Garden at Aberglasney.



Fig 5: The yew tunnel at Aberglasney



Fig 6: The pond at Aberglasney looking south. To the right of the picture is the wooded area, which it seems Dyer walked through on his way to the summit of Grongar

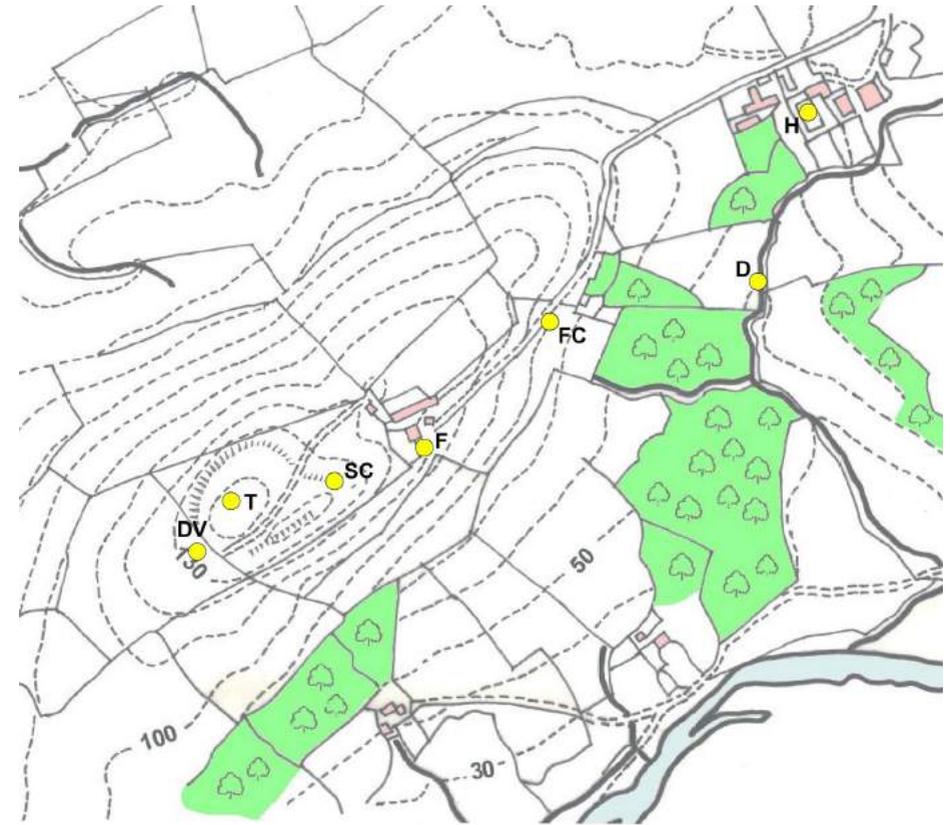


Fig 7: Viewshed Assessment Points along Dyer's Route up Grongar Hill (H = house, D = Dingle, FC = first climb, F = farm, SC = second climb, T = top and DV = Drys view)

Viewsheds along the course of Dyer's Walk

Note that in all viewshed images what is visible is shaded light grey and not visible is dark grey.

Interestingly, the first viewshed from the House at Aberglasney reveals the first historic site to 'rise' from the landscape, namely Golden Grove. (This house is now demolished and replaced by one higher up the valley side). The viewshed image also shows how Golden Grove and its surrounding landscape must have been ever present to those living in Aberglasney and that it hardly seems likely that Golden Grove would not have been in Dyer's thoughts when writing *Grongar Hill*. It is a significant forgotten element of the landscape of Dyer's poem revealed by GIS. The viewshed also demonstrates how well sited was the house at Golden Grove. In its raised situation in the valley floor it was clearly able to survive the common winter floods of the Towy Valley.

In my assessment of the landscape of Dyer's *Grongar Hill* I have noted key points on the route to the summit. I have assessed these points using GIS software. I will note what are revealed from these points and go into more depth at what appear to be the most significant of these viewsheds. The viewshed points investigated are from the House (Aberglasney); the site I have referred to as the Dingle is the wooded valley Dyer seems to describe before he begins his ascent; the First Climb, that is the top of the first sharp incline; the Farm is the plateau about half way up Grongar; the Second Climb the top of the second sharp incline on the ascent; the Top is the summit of Grongar; and Drys View represents the view at the far end of the summit on the Dryslwyn Castle end of the summit plateau.



Fig 8: A close up view of the viewshed from the house at Aberglasney

The seventeenth century house of Golden Grove was substantially damaged by fire ten years before Dyer wrote his poem at which time much of it was left as a ruin. The partially rebuilt Golden Grove, shown in fig. 9, was reputed to be only one wing of the original building. The illustration also seems to confirm the information shown by the House viewshed that Golden Grove was on a low raised hillock in the valley floor.

As an element of Dyer's landscape those who have discussed the poem tend not to consider Golden Grove. Golden Grove had been, 50 years before the time that Dyer was writing, one of the most important country houses in Wales and, had the civil war not intervened, it would have been the site of the meeting of the Council of Wales. Previous assessment of the landscape of Dyer's poem not only ignored Golden Grove but as a consequence all the historic features of the landscape associated with Golden Grove. Many of the features were lost during the 19th century and trees now surround those that remain. But Rowland Watkyns in his poem *Golden Grove, Carmarthen* written in about 1660 records that,

*If I might where I pleased compose my nest,
The Golden Grove should be my constant rest...
There are parks, orchards warrens fishponds springs;
Each foot of ground some curious object brings.*

Whilst viewshed analysis cannot confirm these features it does provide positive proof of the exact location of the house at Golden Grove. With the appropriate use of surviving maps, drawn at the end of the eighteenth century, it will be possible using ArcGIS software to locate the position of

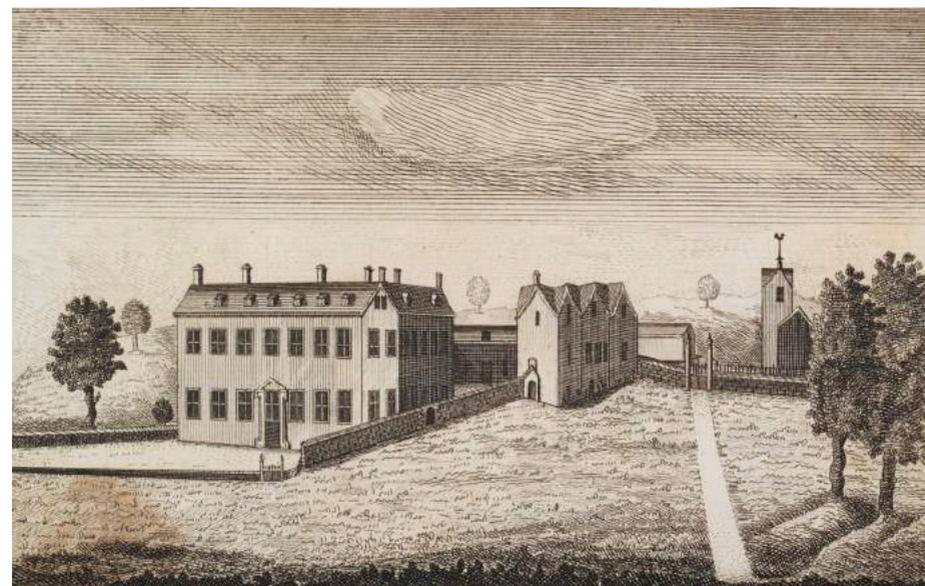


Fig 9: The partially rebuilt Golden Grove circa 1800

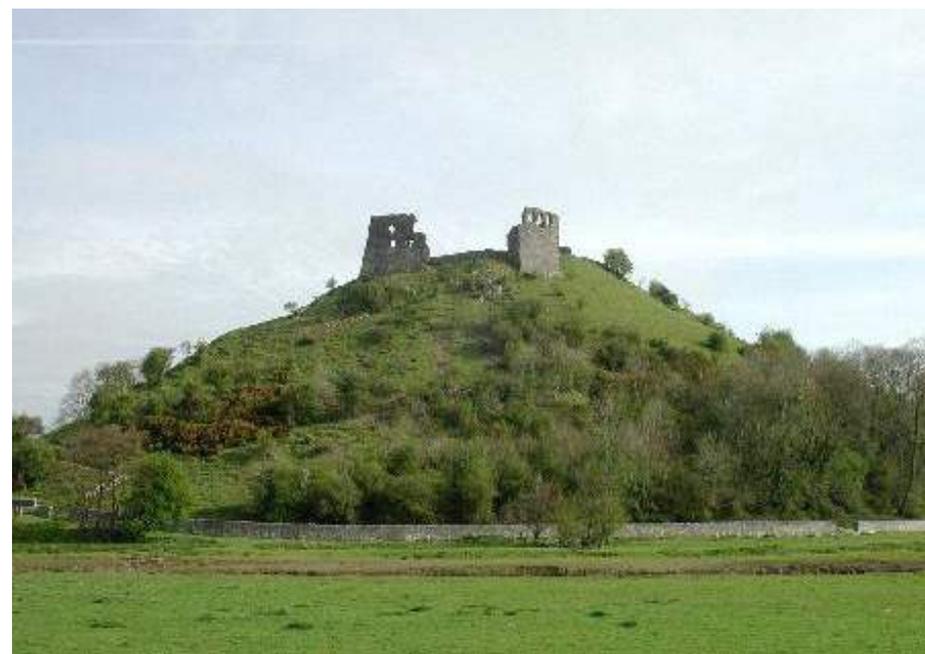


Fig 10: Dryslwyn looking east

some of these features described in Watkyn's poem. With ArcScene it should be possible to create a 3D model to further investigate these features.

Dryslwyn Castle is considered by students of *Grongar Hill* to be the reference in the lines,

*Yet time has seen, that lifts the low,
And level lays the lofty brow,
Has seen this broken pile complete,
Big with the vanity of state;
But transient is the smile of Fate!
A little rule, a little sway,
A sunbeam in a winter's day,
Is all the proud and mighty have
Between the cradle and the grave.*

But as was revealed by GIS earlier in this report Golden Grove was the most significant feature in the landscape from the Dyer's house at Aberglasney. In the early 1700s when Dyer was a boy, the Vaughan family, who had been made Earls of Carbery during the seventeenth century, were left without a male heir and the title died out in 1713. To make matters worse their only daughter married and her new husband set about cutting down the valuable timber of the famous grove for his own profit. As the GIS viewshed analysis shows, in 1712 when Dyer would have been eleven he would have been able to see a large part of the house at Golden Grove burnt down in a fire, much of which was never rebuilt although at the beginning of the nineteenth century it was repaired. At the time of writing *Grongar Hill* the greater part of Golden Grove was a ruin. There can be no question that the lines,

*Yet time has seen, that lifts the low,
And level lays the lofty brow,
Has seen this broken pile complete,
Big with the vanity of state;
But transient is the smile of Fate!*

refer to Golden Grove and not Dryslwyn.

The first castle to be revealed in the ascent at the Farm viewpoint is Dinefwr Castle (see fig 11).

Note the creation of the decorative central feature in the tower which seems to point to the landscape around Grongar becoming something more than 'natural' and away from features being defensive.

Viewshed from the Second Climb

The viewshed from the Second Climb reveals Dryslwyn, the castle noted by many academics when discussing Dyer's poem but it also reveals that Carreg Cennen was visible, previously not discussed in the literature in relation to Grongar Hill.

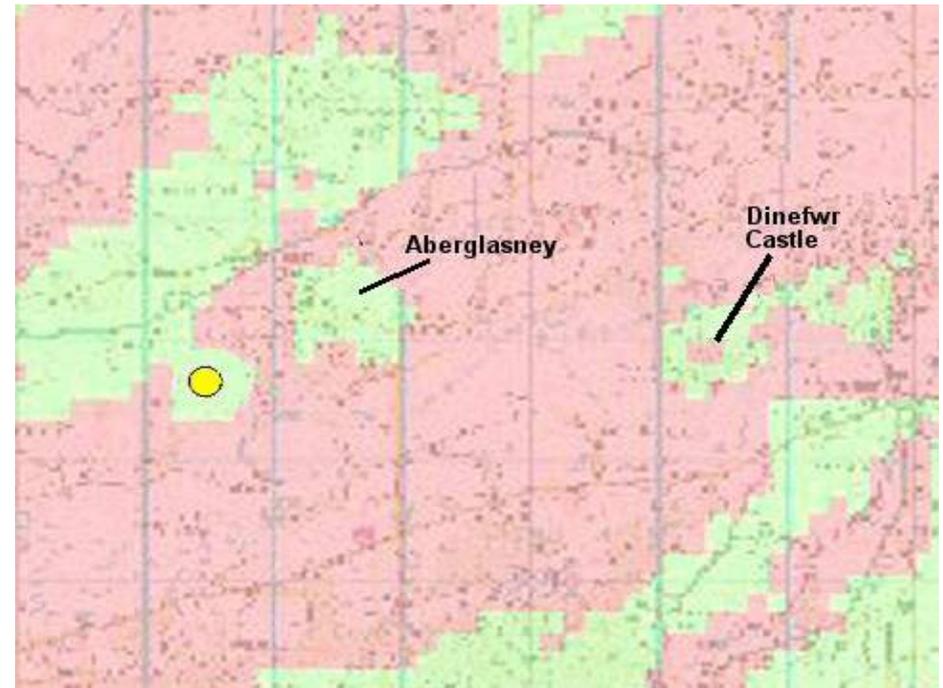


Fig 11: The viewshed from the Farm on the ascent of Grongar Hill



Fig 12: Dinefwr Castle 1670



Fig 13: Dinefwr Castle present day.

Viewshed from Carreg Cennen

The Carreg Cennen viewshed is perhaps the most intriguing of the study. Here it is clear that it is only from a limited area around the summit of Grongar Hill that Carreg Cennen can be seen. Similarly it is only from the summit of Dryslwyn Castle that Carreg Cennen can be seen. Dyer's

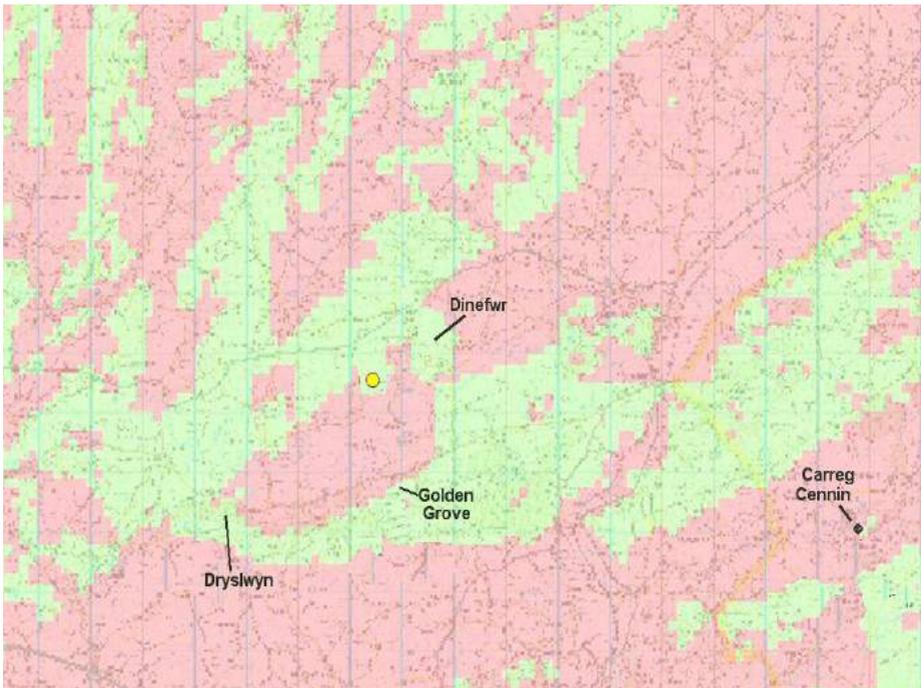


Fig 14: The viewshed from the top of the second climb

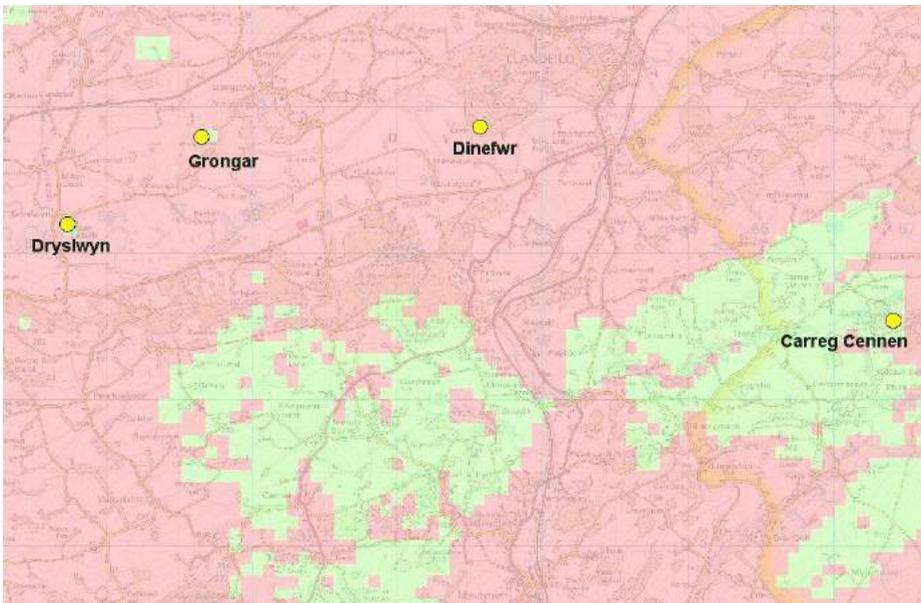


Fig 15: The viewshed from Carreg Cennin, showing intervisibility with Grongar Hill

poem can be seen to be, beyond its contemplative lyrics, one that is a truly accurate topographical description. GIS reveals that if, in the present day, it was possible to climb to the top of Grongar hill the landscape would still produce the ‘conjuring trick’ of the topography described by Dyer.

A further revelation of the close relationship between Golden Grove and Dyer’s Grongar Hill can be seen. The viewshed from Carreg Cennin reveals a point of high ground on the Golden Grove almost directly opposite to Grongar which early OS maps refer to it as Carbery Mount. For a description of its importance see appendix II.

And sinks the newly-risen hill

It is interesting to note that by the use of GIS how accurate is the description by Dyer that, *Wider and wider spreads the Vale; As Circles on a smooth Canal*. The viewshed does seem to reveal the mountains to be appearing as ‘Circles on a smooth canal’ with the epicentre at Aberglasney.

And that truly

*Sooner or later, of all height,
Withdraw their summits from the skies,
And lessen as the others rise:
Still the prospect wider spreads,
Adds a thousand woods and meads,
Still it widens, widens still,
And sinks the newly-risen hill.*

Without the use of GIS, the restricted access to the site would have made this assessment of the landscape of John Dyer’s poem impossible. As such it can be seen that it is a tool that should prove to be invaluable to those who assess landscapes. Most viewshed analyses undertaken in landscape architectural projects concern issues of visibility of as yet unbuilt interventions, be they wind turbines, new factories or transport routes. The applications of the technique are endless but, as this investigation has shown, historical research can reveal, on the one hand, the topographic veracity or, on the other, the poetic licence used to enhance the effect of the poem. Either way it provides a new insight.

Biographical notes

Russell Mainwaring presented this report as part-fulfilment of the post-graduate module EM413 Dealing with Spatial Data: GIS, Mapping and Remote Sensing to demonstrate a specific application of the technology to landscape architecture.



Fig 16: Carreg Cennen looking south



Fig 17: Grongar Hill today, viewed from the north-west

GRONGAR HILL

John Dyer (1727)

Silent Nymph, with curious eye,
 Who the purple ev'ning lie
 On the mountain's lonely van,
 Beyond the noise of busy man,
 Painting fair the form of things,
 While the yellow linnet sings;
 Or the tuneful nightingale
 Charms the forest with her tale;
 Come, with all thy various hues,
 Come, and aid thy sister Muse;
 Now, while Phoebus, riding high,
 Gives lustre to the land and sky,
 Grongar Hill invites my song,
 Draw the landskip bright and strong;
 Grongar, in whose mossy cells,
 Sweetly musing, Quiet dwells;
 Grongar, in whose silent shade,
 For the modest Muses made,
 So oft I have, the ev'ning still,
 At the fountain of a rill
 Sate upon a flow'ry bed,
 With my hand beneath my head;
 While stray'd my eyes o'er Towy's flood,
 Over mead, and over wood,
 From house to house, from hill to hill,
 'Till Contemplation had her fill.

About his chequer'd sides I wind,
 And leave his brooks and meads behind,
 And groves, and grottos where I lay,
 And vistas shooting beams of day:
 Wide and wider spreads the vale,
 As circles on a smooth canal:
 The mountains round, unhappy fate!
 Sooner or later, of all height,
 Withdraw their summits from the skies,
 And lessen as the others rise:
 Still the prospect wider spreads,
 Adds a thousand woods and meads,
 Still it widens, widens still,
 And sinks the newly-risen hill.

Now, I gain the mountain's brow,
 What a landskip lies below!

No clouds, no vapours intervene,
 But the gay, the open scene
 Does the face of nature show,
 In all the hues of heaven's bow!
 And, swelling to embrace the light,
 Spreads around beneath the sight.

Old castles on the cliffs arise,
 Proudly towering in the skies!
 Rushing from the woods, the spires
 Seem from hence ascending fires!
 Half his beams Apollo sheds
 On the yellow mountain-heads!
 Gilds the fleeces of the flocks,
 And glitters on the broken rocks!

Below me trees unnumber'd rise,
 Beautiful in various dyes:
 The gloomy pine, the poplar blue,
 The yellow beech, the sable yew,
 The slender fir, that taper grows,
 The sturdy oak, with broad-spread
 boughs;

And, beyond, the purple grove,
 Haunt of Phyllis, queen of love!
 Gaudy as the op'ning dawn,
 Lies a long and level lawn,
 On which a dark hill, steep and high,
 Holds and charms the wandering eye!
 Deep are his feet in Towy's flood,
 His sides are cloth'd with waving wood,
 And ancient towers crown his brow,
 That cast an awful look below;
 Whose ragged walls the ivy creeps,
 And with her arms from falling keeps;
 So both a safety from the wind
 In mutual dependence find.

'Tis now the raven's bleak abode;
 'Tis now the apartment of the toad;

And there the fox securely feeds;
 And there the pois'nous adder breeds,
 Conceal'd in ruins, moss, and weeds;
 While, ever and anon, there falls
 Huge heap of hoary moulder'd walls.
 Yet time has seen, that lifts the low,
 And level lays the lofty brow,
 Has seen this broken pile complete,
 Big with the vanity of state;
 But transient is the smile of Fate!
 A little rule, a little sway,
 A sunbeam in a winter's day,
 Is all the proud and mighty have
 Between the cradle and the grave.

And see the rivers how they run
 Thro' woods and meads, in shade and
 sun!

Sometimes swift, sometimes slow,
 Wave succeeding wave, they go
 A various journey to the deep,
 Like human life to endless sleep!
 Thus is nature's vesture wrought,
 To instruct our wand'ring thought;
 Thus she dresses green and gay,
 To disperse our cares away.
 Ever charming, ever new,
 When will the landskip tire the view!
 The fountain's fall, the river's flow,
 The woody valleys, warm and low:
 The windy summit, wild and high,
 Roughly rushing on the sky!
 The pleasant seat, the ruin'd tow'r,
 The naked rock, the shady bow'r;
 The town and village, dome and farm,
 Each give each a double charm,
 As pearls upon an Ethiop's arm.

See on the mountain's southern side,
 Where the prospect opens wide,
 Where the evening gilds the tide;
 How close and small the hedges lie!
 What streaks of meadows cross the eye!
 A step, methinks, may pass the stream,
 So little distant dangers seem:
 So we mistake the Future's face,
 Ey'd thro' Hope's deluding glass:

As yon summits soft and fair,
 Clad in colours of the air,
 Which to those who journey near,
 Barren, brown, and rough appear;
 Still we tread the same coarse way;
 The present's still a cloudy day.

O may I with myself agree,
 And never covet what I see:
 Content me with an humble shade,
 My passions tam'd, my wishes laid;
 For while our wishes wildly roll,
 We banish quiet from the soul:
 'Tis thus the busy beat the air;
 And misers gather wealth and care.

Now, ev'n now, my joys run high,
 As on the mountain-turf I lie:
 While the wanton Zephyr sings,
 And in the vale perfumes his wings;
 While the waters murmur deep;
 While the shepherd charms his sheep;
 While the birds unbounded fly,
 And with music fill the sky,
 Now, ev'n now, my joys run high.

Be full, ye courts; be great who will;
 Search for Peace with all your skill:
 Open wide the lofty door,
 Seek her on the marble floor:
 In vain ye search, she is not there:
 In vain ye search the domes of Care!
 Grass and flowers Quiet treads,
 On the meads, and mountain-heads,
 Along with Pleasure, close ally'd,
 Ever by each other's side:
 And often, by the murm'ring rill,
 Hears the thrush, while all is still,
 Within the groves of Grongar Hill.

THE MOON: THE DARK SIDE OF THE LANDSCAPE

Aydin Zorlutuna

*Up to 30% of street light source goes directly up into the sky
 ... we are in danger of eliminating one of our finer natural
 and emotional experiences – the view of a dark, star-filled sky
 (Fieldhouse, 1990)*

In our persistence to effectively 'extend' the daytime, we have become conditioned to accept that our predominant experience of the night-time should consist of artificial illumination. As such, many of us have lost the ability to perceive the night-time for what it truly is – one half of the circadian cycle, the twenty four hour alternation of light and darkness. In this cycle we understand that the day and night are opposites, as we commonly experience their recurrence in everyday life. Consequently, the potency of the night-time is best felt in its 'natural' and unpolluted state, when its existence as an extreme opposite to daytime is most pronounced.

The moon is an integral part of the night-time and serves as a natural nocturnal light source, in the same way that the sun does of the daytime. Because moonlight is much less intense than sunlight, its effect on the landscape is much more subtle. Contrary to this is the power of its related symbology, and the consequential effects that this has on our psychological perception of night-time. Furthermore, there is increasing evidence that the moon's gravity has an effect not only on the ocean tides, but also in the growth of plants, the control of biorhythms in humans, the control of atmospheric conditions and the movement of the earth's crust itself.



Fig 1: Moonlight over the Worm's Head, Gower, South Wales

All of these aspects are as important to the consideration of designing the nocturnal landscape as the sun and its effects are to the design of the daytime landscape. We should, therefore, begin to realise that our experience of 'landscape' should not be confined to the daytime, or to the 'artificial' night-time. Instead, we should make a conscious effort to experience the landscape in the context of both the daytime and the true nature of night-time.

There is, however, the problem of security. Our primal need for security in the landscape is the most fundamental reason for our common reluctance to immerse ourselves in the night-time. In the darkness of the night we feel vulnerable and insecure, largely because of a reduction in visual sensation. However our other senses could, and should, play an integral part in our experience of the night-time landscape in order to reduce that sense of insecurity.

Sensation

It is a fact that we commonly 'ignore' much of our incoming sensory information, either because it does not seem relevant or it is not threatening. To this end, we do not fully perceive a high proportion of our diverse environment, to the detriment 'of our potential experience. We become locked in a body of ambient sensitivity and do not fully exploit the potential of our sensory organs. To recognise this is to take the first step towards an increased awareness and perception of the environment. We become aware that we are not aware. To utilize and, as such, re-sensitize the senses in a conscious way, we inevitably raise our perception of the world. For example, by becoming fully aware of the sense of smell, we may broaden and, indeed, 'change' our perception of an object by adding a new dimension to the way we perceive it. As such we should strive for the conscious use and harmonious interaction of all our senses, within the diverse and stimulatingly rich environment, in that we may positively and fully perceive a higher, holistic reality of the world.

Perception

We cannot safely say that we perceive the world solely by means of the senses, because inevitably the aspects of memory, emotion, fantasy and imagination all crystallize and enrich any perception that we have of the environment. Our perception of the sensual world is therefore partly independent of the sensory information we receive. We naturally perceive objects and shapes in the formation of clouds, in rocks, in the crooked oak tree, and in the silhouette of hills and mountains. At night, we perceive silhouetted forms as lacking depth of field and, thus, they are product of the illusive distortion of physical reality.

Silhouetted form is a predominant constituent of the night-time landscape (Figure 1). In this way, the night-time landscape is an illusive landscape, but only as the result of our overdependence upon our visual sense. To the other

senses, our perception of the nightscape is as true to reality as the dayscape. This does not imply that the visual sense is consequently rendered useless at night-time, but is merely subject to a change in sensitivity through the increased activity of rod neurones in the retina of the eye.

Cycles

We cannot escape the image of life in our perception of the landscape. All around us, in the hierarchical functioning of an ecosystem, is the perpetual cycle of life and death. To this end, the landscape is a dynamic system, subject to metamorphosis as a direct result of that cycle. There is also the occurrence of the yearly cycle through which we observe the passage of the seasons, where the two extremes of summer and winter are metaphors to life and death.

The same can be said of the cycle of day and night. On the basis that daytime and night-time are two extremes, their opposing effects on the characteristics of the landscape are equally extreme. In dawn and dusk these extremities meet, respectively reflected in spring at the birth of life and the lengthening of sunlight hours, and in autumn, as leaf colour mirrors the sunset and the hours shorten. In the understanding and experience of this cyclical process through our experience of the landscape, we redress any imbalance in our perception of the environment. To this end, we must understand that our experience of the night-time is as important as the daytime.

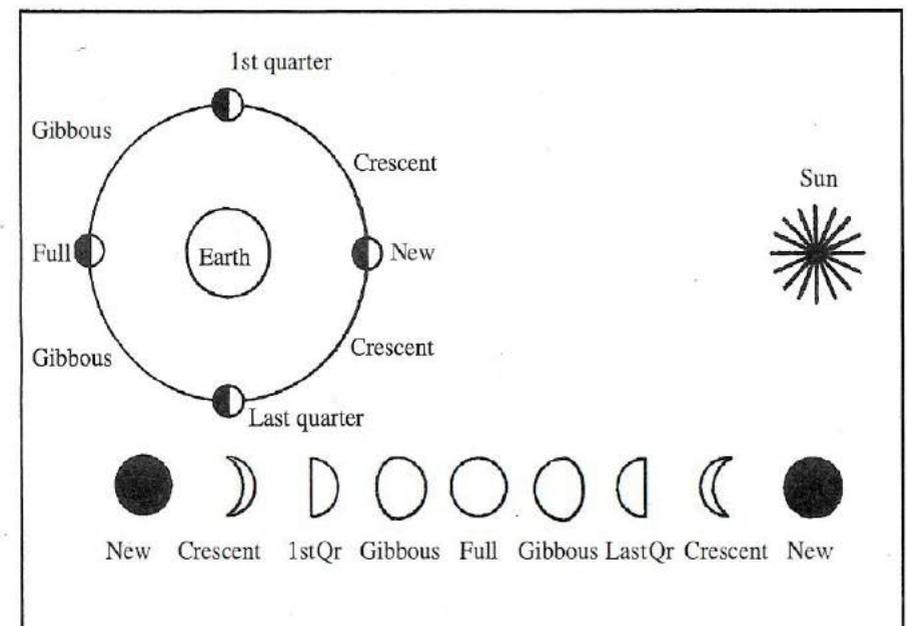


Fig 2: Phases of the moon (diagram not to scale)

The Night

In many ways, night-time symbolizes and induces passivity. Many lifeforms become passive at night, either because they inherently need a period of rest from activity, or because the absence of sunlight is an arresting factor to their biological metabolism. Plants, for example, release oxygen as a by-product of photo-synthesis during the day and release carbon dioxide during the night as they 'passively' respire. We too become passive in a radical way. In the extensive utility of our visual sense during the daytime, the drastic reduction of light intensity at night renders our vision 'passive' – secondary to other senses. It is important, therefore, in our efforts to experience the landscape at night, to perceive the nightscape as a dynamic collection of secondary 'markers' as represented by the textures of bark, the taste of fruits, the distinction of scents.

Visual perception is diversified under the sensual experience of moonlight. With the moon providing illumination, a proportion of nocturnal vision is redressed. Because moonlight is reflected sunlight, it imbues the cooler passive colours of blue, silver and white upon the landscape. Obviously as it waxes and wanes, the moon's light varies in intensity, but on a cloudless night the light of the full moon produces a level of visibility similar to that of an overcast evening. This seems to indicate that the night is not as alien to the day as we like to think. What is more, the moon, like the sun, imposes a physical influence upon the earth, and much of life present there.

The Moon

Our perception of the daily circadian cycle is geared primarily to the rising and setting of the sun. This solar principle is accepted as common knowledge, but how many of us are acquainted with the lunar principle? The study of lunar astronomy is called selenology, fundamental to which is the lunar cycle, the time taken between two full moons, on average 29 days, 12 hours and 44 minutes. That period we call the lunar (or synodic) month.

During the lunar month, the moon passes through a number of 'phases', or apparent changes of shape (Figure 2). At 'new' moon, the dark side of the moon is turned towards us and normally cannot be seen from earth. At 'full', the whole of the sunlit side is presented, while at intermediate times, during waxing or waning phases, the moon may be half, gibbous or crescent.

Physical Influences

The tidal pull of the moon's gravitation on the seas is possibly, to the average individual, the most commonly known effect of the moon on the earth. What is less known is that the moon dictates certain rhythms and biological activities of plants and animals. The most prominent evidence of the moon's influence on plants is in their germination. It has been found, in many controlled experiments, that the waxing moon is a vital factor to

successful germination. The moon also regulates and controls the activities and reproductive cycles of many birds and animals. Sexual activity, emotional fluctuation, and other biological rhythms are held largely as a result of the moon. The most disturbing influence, however, is the causation of lunacy in man. It is generally accepted that lunatic (from Latin, luna = moon) patients often suffer particularly violent bursts of activity during the new and full moon phases.

The Landscape

Moonlight offers to our perception a unique quality of landscape character and consequent experience. Sensually, it is the visual contrast between the white, silvery moonlight and the black, foreboding shadows that is paramount in our sensory perception. Moonlight shadows are markedly different to sunlight shadows. They appear as ominous black patches upon the landscape, hugely exaggerated by even the slightest of hollows or smallest of trees. The powerful silhouette of trees, and other landscape features, against the moonlit sky can be strangely intimidating. The silhouettes of deciduous trees are most potent when perceived in the winter season, when the leafless and specific forms of different species are most prominent. Backed by a clear moon, the accentuation of the silhouette often gives the tree a vaguely humanoid form, particularly a crooked oak, with its finger-like branches poised in anticipation toward the unwary observer. The image in reality is actually quite terrifying!

The image of moonlit water, on the other hand, is evocatively tranquil. The passive reflectivity of moonlight upon the water's surface is a revelation. Moon and water share a 'common ground', both being reflective of light. And yet, somehow, the visual connection seems to be only part of the picture. The rest is deeper: the sound of running water at night-time has a therapeutic quality, breaking the tension of the predominant silence and providing an ambient noise on which to focus attention, both physically and psychologically. The connections go even deeper: they share the same symbols.

Moon Symbology

Many aspects of moon symbology are married to those of earth symbology, to such an extent that they often share the same symbols; these being predominantly representative of one or more aspects of femininity. A major link exists between the roundness of the moon and the curvature of the female body. "A woman with her arms upraised is one of the most basic forms of the moon symbol" (Rush, 1976). The potency of this form lies in the gesture of embracing and receiving the moon with the upraised arms, but more importantly, it reflects the shape of the crescent moon (Figure 3). Likewise, water is emblematic of femininity (and thus the moon) in the notion of passivity, opposed by fire (masculinity, and thus the sun) in the notion of activity.

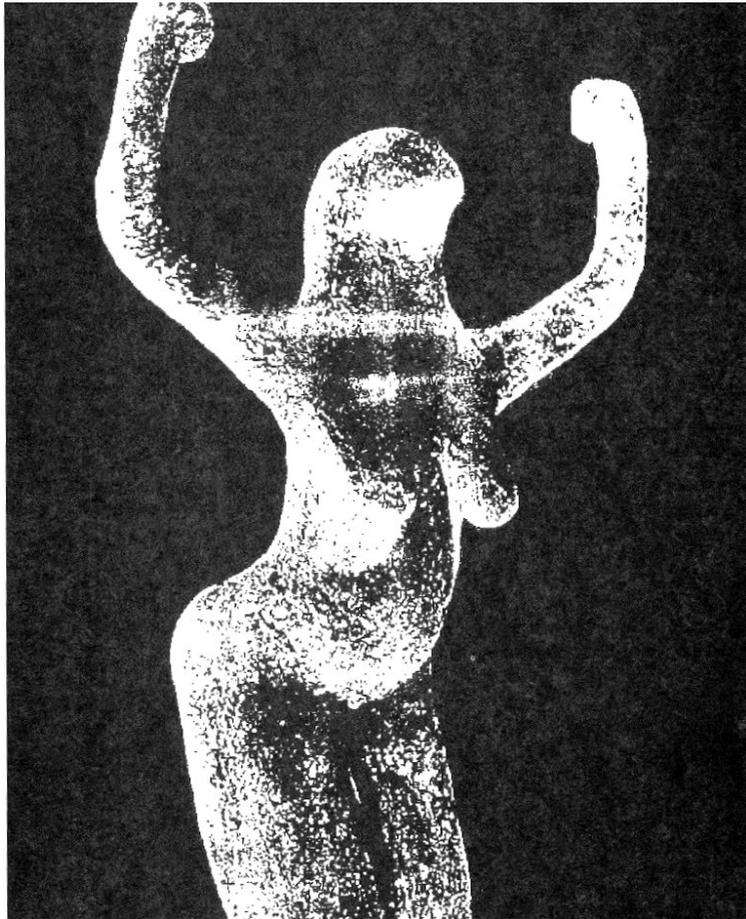


Fig 3: Moon symbol: female form with arms upraised

Another aspect of femininity inherent in the moon (and earth) symbology is the notion of maternity (or procreation). Ultimately the moon could be considered a symbol of life as represented in its cyclic repetition. The silver crescent, as an image of the moon, symbolizes the notion of life and death, representing at once the 'cup of life' and the 'sickle of death'. Moon symbology and related consciousness ultimately provides a hugely important and essential resource required to design landscapes for the moon.

Moonlore and Folklore

It was the agriculturally dominant societies that offered most reverence to the moon, owing to their understanding of moon symbology. Perhaps for this reason, in early traditions, women were the first planters, while men were the hunters. The dictation of lunar phasing upon the agricultural

regime meant that these early cultures took very seriously the planting and harvesting of their crops. The marriage of symbolic appreciation and experimental practice of the effects of the moon upon plants led to gardeners' lores concerning planting times:

Every old wife will tell you to sow seed and to transplant only with a waxing, never a waning moon ... (Boland & Boland, 1976).

There are endless moon-based superstitious beliefs that have survived in folklore. Tales of lycanthropy, werewolves and human transformations under a full moon are stories which are so widespread that they "must represent some important behavioural and cultural truth" (Llewellyn, 1990).

Some pagan societies held the sky as their temple dome and the horizon as its boundary. The idea of enclosure within a roofed building opposed their celestial values, blocking out the stars, the sun and the moon. For this reason they built constructs such as Woodhenge and Stonehenge – earth temples from which to worship and predict solar and lunar events, solstices, equinoxes, eclipses. These predictions essentially marked calendric, agricultural, medical and religious ceremonies.

To the landscape architect, an overview of the cultural beliefs of moonlore and folklore are required if one is to design competently for the moon, where cultural myth gives depth to the understanding of symbolic use in design. Likewise in poetry and imagination, we can touch the deeper functioning of the landscape. Where the poet speaks in metaphors of the moon, the goddess and the blood of our ancestors, the landscape architect has the ability to sculpt the land into living poetry and to consequently 'trigger' the imagination of individuals within the landscape.

If the landscape architect is to competently design for the moontime (and night-time generally), he or she must be prepared to do so on two levels. Initially the design which accommodates our physical perception of that landscape is paramount in our need for some sense of security, and this is achieved through the sensory experience. It could be argued that this level is dominated by a deeper level of our psychological perception of the landscape that concerns symbology, imagination, poetry.

Nocturnal Design

Although the colours in moonlight are very limited in range (principally the blues), their tonal variation can be accentuated in the conscious design of the landscape. The sensible specification of plant and hard materials, whose reflective qualities are known, can achieve interesting tonal emphasis. Furthermore, consideration of the wider composition, in relation to the play of blue/white moonlight against the black/blue sky, can present possibilities for distinctive views.

In conjunction with our awareness of moonlight is our perception of form. The bold and powerful use of mass form is the most effective method of 'isolating' our awareness of the visual sense, in that we are 'overwhelmed' by our visual perception of such form. Primarily, this is how we visually perceive vegetation *en masse* at night-time, as it is silhouetted against the landform or the sky. The landscape architect must therefore be conscious of the use of form, in the knowledge that it is the silhouette that will be dominant, not the three-dimensional aspect. As the silhouetted oak portrays a unique character and invokes specific emotions within the viewer, so the same effect may be found in other trees.

Here are some tree species and the 'characteristics' of their leafless forms:

Species	Character
<i>Quercus</i> (oak)	intimidation, steadfastness
<i>Betula</i> (birch)	passivity, tranquility
<i>Malus</i> (apple)	mystery, beauty
<i>Fraxinus</i> (ash)	grace, silence
<i>Fagus</i> (beech)	age, wisdom

Although very subjective, the above list might indicate a broad notion of the potential uses of tree forms in nocturnal design.

Another exaggerated aspect of form can be witnessed in the effect of moonlight on landform. Even the slightest fissures and hollows of a moderately flat landscape are enormously accentuated as a result of moonlight. Consequently, shadows are equally as bold. What is perhaps by day only a small hollow, by night becomes a huge gaping mouth, yawning across the undulating landscape. In full moonlight, shadows effectively exaggerate the tonal contrasts of the landscape and, in the extreme, we begin to perceive texture. Obviously the visual quality of textured form would be largely dependent upon reflectivity. This is particularly so in the case of water. It is a dynamic, metamorphic texture, which should be seriously considered in the design of the nightscape.

Sensory Markers

The diversity of plants in their scents, textures and visual appearances allows many variations in nocturnal design, in that they can be used primarily as sensory 'markers' in the landscape. When sight is less important, these attributes of plants become more noticeable. For example, distinctly scented plants can serve as olfactory landmarks, and likewise distinctly textured plants can serve as touch 'stations'. Olfactory plant markers need to be night blooming species, in order to enhance the visual diversity. Such flowers commonly bend towards the moon in the hope that moths will see them more easily and pollinate them.

Of those plants which are night-blooming, the following are particularly notable: *Jasminum*, *Primula vulgaris*, *Gladiolus tristis*, *Nymphaea* and *Petunia axillaris*. Then there are those plants whose flowers, bark or other features have reflective qualities, such that they illuminate well at night. These might include *Cerastium tomentosum*, *Betula pendula*, *Cortaderia*, *Senecio* and *Phlox*.

The ambient rustle of leaves can add an auditory aspect to nightscape design. So too can the use of certain path and surface materials, since at night-time we metaphorically 'see with our feet'. Needless to say, the path would have to be of relatively coarse material for us to feel it through footwear.

Despite the importance of sensory markers, we must be careful not to saturate our perception with a frenzy of sounds, sights, smells ... Less is more, because we increase our sensual perception at the discovery of each new marker. We need the experience of absence to fully appreciate presence.

Symbolic Design

In the design of the nocturnal landscape the symbolism of femininity should be to the fore. In landform and vegetation, this is best achieved as it is sculpted, manipulated, and subtly exaggerated to an image and curvaceous form reflecting the feminine symbolism. Ultimately, all symbolic meaning is perceived at a higher level of consciousness to the initial perception of the symbol. Thus symbols provoke a shift in consciousness. It may seem ludicrous to promote the idea that we should meditate on moon and earth symbols as a product of landscape experience, but we already do – as we sit by a lake or enjoy the solitude and peace within a woodland.

Conclusion

The product of our one-sided experience of the landscape has led to the biased misconception that is our only side. It is not. The nocturnal landscape offers as much – albeit radically different – sensory stimulation and consequent experience as the daytime landscape. Furthermore, an overview of the circadian cycle, in its perpetual revolution of opposing forces, establishes that the extremities of night and day are inseparable and interdependent. Hence we need to complement our predominant daytime experience with a night-time experience.

The moon is a powerful symbol and its links with poetry and imagination are important design factors. Through the ritual acts of, say, fixing stones in the landscape as markers, we are grounded by the physical motions and gestures that integrate the metaphors and symbols, and stimulate intuition and the unconscious. Therefore we are immovable in one aspect and volatile in another, matching the phasing of the moon around the constancy of time.

It is my belief that we, as designers of the landscape, should regard our medium as a complete system. We should not restrict our designs to the limitations of the senses. At night, in particular, intuition and imagination are key components to the landscape experience. We should therefore be designing for both the daytime and the night-time, holistically. They are one.

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Aydin Zorlutuna was a graduate and diplomate of the Cheltenham School of Landscape Architecture. This is an edited version of his BA (Honours) dissertation which was first published in Landscape Issues in 1996.

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