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SKYSCAPES OF CLIFTON

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ABSTRACT

Skyscapes are a combination of landscape, sky, and people in the context of a full place experience including the temporal dimension. When a viewer becomes aware of rhythms in sky and environments, memories and history unravel. The viewer enters a dialogue with place and experiences the skyscape through watching, allowing the exploration of its meaning.
This project is an interdisciplinary approach towards skyscape through deeper engagement with the place of Clifton campus at Nottingham Trent University (NTU). A phenomenological approach will identify locations that reveal memories and an affectional dimension. The panorama will be implemented into a planetarium software (Stellarium) to experience the passage of celestial objects in time, and reveal rhythms and cycles through which the Clifton campus defines itself. Essentially, it will illutstare how place and therefore skyscape is explored.

KEYWORDS: Archaeoastronomy, Phenomenology, Stellarium, Landscapes.

1. INTRODUCTION

A skyscape is a view of the sky framed by land including the interconnectedness of sky, land and people (Silva, 2015). When a person immerses themselves within a place, as defined by Martin Heidegger ([1926] 1996) and Yi-Fu Tuan (1979), a location that combines temporality and meaning with its physical expanse, they watch and engage in a skyscape experience. The experience of watching (Brown, 2015a) is far more resonating than simply observing because the person within the place is engaging with the landscape on a deeper level.

A skyscape experience can be created within Stellarium (Stellarium, 2016). Stellarium is a piece of planetarium software that can be used to simulate the movement of stars at specific times and locations within landscapes that the user can upload. The constellations and their respective art can be included in Stellarium. If the user correctly orientates a landscape, an alignment can be created from their view point to a feature on the ground towards an object in the sky. This is one way in which the sky and the landscape are no longer separate components of the skyscape. Others include for example creating landscapes in the sky. People become a part of the skyscape when they watch this combination within a landscape. Temporality is subjective to the observer, it is created more easily in a place of historical significance or somewhere including relevant memories and experiences. If the alignment created is connected to the memory or an experience the observer had there, this enhances the skyscape experience.

The primary aim of this project was to create a skyscape experience within Stellarium. The landscape would be of a site within Nottingham Trent University's (NTU) Clifton campus. The environment of the campus means that most people engage with it solely on a functional level. Thus, most of the users engage with the campus only partially and therefore might not engage in the full place experience. Our prime motivations behind this project were to realize the Clifton campus beyond just its functionality and see it in its full context.

The sky is the oldest and most universal way to connect us with beliefs of ancient peoples. This connection is being lost to light pollution. A light pollution survey was an investigation into how impaired our view of the sky is above the Clifton campus and how much this is altering our skyscape. By undertaking this project, we have attempted to integrate sky into the landscape by aligning celestial rhythms and motions in the sky with physical features of a site. Thus, a resonating place experience, with the spatial, temporal and personal dimensions is created within the Stellarium software.

2. SUPPORTING THEORIES

A phenomenological approach was key in order to inform the skyscape experience in Stellarium. Catherine Cassell and Gillian Symon (2004 : 12) describe phenomenology as a "major philosophical tradition" which has had a substantial impact on the social sciences and thus we saw it necessary to apply this theory to our research in pursuit of illuminating specific phenomena conveying how they are perceived by the users of the campus.

The final outcome of this research project included artistic impressions of campus users' experiences in an aim to convey memories and meaning embodied in the landscape. Tim Ingold's The Temporality of the Landscape sees "meaning as something which exists to be discovered in the landscape" and every feature is seen as a "potential clue" and a "key to meaning, rather than a vehicle for carrying it" (Ingold, 1993). The gathering of this deep information and perceptions through inductive, qualitative methods such as interviews and site tours, informed a core part of our final outcome, which allowed the production of the final skyscape showing phenomenological representations from the site users' perspective (Lester, 1999).

A deeper perception of place is impossible without human agency (Ingold, 1993), so understanding the socio-cultural factors was just as important as understanding the physical landscape. Memories, emotions and connections which the users have with the campus played an important part of analysing the relationship between people and their surroundings, which enabled us to form an integration of time (a temporal dimension), space (surroundings) and experiences (Ingold, 1993) in our impressionistic panoramas for the Stellarium skyscape experience.

3. METHODOLOGY

3.1 Tours

The project was undertaken in June, 2015, outside of term time. Guided tours around the campus were essential to produce a holistic artistic panorama conveying sensory and physical aspects observed at different points on the site. On a University Open Day, the site temporarily became active and filled with prospective students, parents and some current students. Campus user observations helped to analyse the interaction of the users with the surroundings, by collecting detailed notes on the way the users were engaging with the campus landscape.

As well as the user observation, we also joined a guided tour in which a current university student guided a group of 10-12 prospective students and parents around key points. The tour took a specific path, following the most commonly used route

around the campus and thus the most active locations at the time. The guide provided key information about the use of the site including where each subject department is located, where people mostly spend their social time and places regarded as important for the university experience.

Following a path and "a trail along which life is lived" can be related to Ingold's Lines theory, in which he describes wayfaring as a "trail of growth and extemporaneous movement" (Ingold, 2007 : 72). An analysis of such activity can provide very telling information of human geography, illustrating how although the university is an "environment built as assemblies of connected elements", the occupiers of the campus continue to make their own ways through the environments, "tracing paths as they go", not just occupying, but inhabiting the environment in which they dwell, thus having ingrained memories and experiences in the site itself (Ingold, 2007 : 72).

We also undertook a guided tour and a bat tour with the campus ecologists who provided a detailed historic and contemporary account of the site. Understanding the site's biodiversity and natural terrain in the final product was crucial to gain in-depth knowledge. This also inspired the inclusion of people and biological life actively occupying the campus adding depth and life to the final result.

3.2 Interviews

Research outside of university term time, resulted in difficulty sourcing a large sample of interviewees. As a result the majority of our interviewees were acquaintances of the research team and a mixture of Physics undergraduate students, Physics PhD students, Professors, two ecologists, and two physics placement students.

One series of interviews was semi-structured by a questionnaire which aimed at understanding how the campus users interact with their environment and what it means to them. This featured questions such as "Which parts of the campus do you use most often and why?", "Which of these places are most important to you?" and "Describe each of these places using three words". These questions were particularly tailored to encourage the interviewees to give honest questions about their relationship with the campus.

The second open ended interview was more detailed, drawing out emotions, personal connections and sensory memories of the landscape from the participant. Such deep engagement was achieved by locating the interview in a relevant place defined by the interviewee.

Each interview was conducted by three interviewers taking notes with one of them leading the interview. This approach increased the validity of the findings by reducing the interviewer bias.

The primary advantage of the interviews was that they provided ''more detailed information than what would have been available through [the] other data collection methods'' such as surveys, or observations (Boyce & Neale, 2006). Interviewees were made to feel comfortable conversing about the subject as opposed to filling out a survey.

Being outside of term time, it was difficult to find people to interview from other departments limiting the sample size to physics related individuals. Therefore, repeated responses indicating sufficient sample size as outlined by Boyce & Neale (2006) might be an effect of a subject specific bias.

3.3 Panoramas

Sites for the panoramas were selected based on feed-back from the open-ended interviews and input from the tours. As outlined in Brown (2015b), the Stellarium landscape is created using a camera, a compass, tripod and image processing software.

The light pollution survey was undertaken using a Sky Quality Meter (SQM, Unihedron 2016), an equidistant grid, and three light pollution readings recorded at each point. Reference points were denoted to capture sky variations from night to night, since the survey had to be completed in several nights.

The small acceptance angle of the SQM and taking zenith readings countered the sky glow over the horizon. At the beginning of each night of surveying, the reference points were re-visited ensuring the results are calibrated properly. Variation was minimalised by surveying at the same time each night. No significant variation was noted between different nights.

4. RESULTS

4.1 Tours

The tours informed a large part of the research outcome. It was found that the areas most densely populated by trees and hedgerows along the nature trail were the areas where the bats on the campus nested and the area surrounding the new 3G pitches. The name coined for this part of the campus was 'the Conflict Zone.' The sports grounds were constructed upon a wooded area rich in biodiversity. This area used to be a sound barrier between the university and the nearby Clifton village. Now local residents are frequently exposed to bright floodlighting and noise. Hence, there is a conflict between the financial, environmental and community agenda. These aspects further increased our interest in using this area as a panorama site or 'memory point' to enhance the artistic impressions. The term 'memory point' is used to define a chosen location on the campus which is rich in memories and experiences as defined by the results from the methodologies undertaken.

During open days we noticed people lounging on the rugby field, reading books and sleeping under tree shades on most of the grassed areas on the campus. The area around the science laboratories and the Erasmus Darwin (ERD) building was most fascinating to observe human behaviour because people were not allowed inside at the time. Therefore, they were peering through the laboratory windows, wandering around the outside which made the space seem special or sacred. These patterns of behaviour "challenge[ed] the fundamental principles of geographic behaviour" typically observed around a university campus (Stoddard, 1987 : 2).

This space was observed as the main circulatory area for this part of the campus and used as the second memory point.

4.2 Interviews

The main result from the semi-structured interviews is that most people engage with the campus on a very functional level only. The places we had explored on the campus periphery were barely mentioned. Most of the respondents in the interviews mentioned the ERD laboratories as places of significance to them. 20 people including current students and staff were interviewed in the first semi-structured interview. Several participants strongly felt that the ERD building held significance in their memories of the site because it was their "place of work", and the cafeteria was where they "enjoyed [their] lunch regularly".

Other prevalent experiences were of attending lectures in the ERD building, using lecture room 282, recalling vivid memories of "long sweaty afternoon lectures", using the laboratory and computer facilities in ERD, with memories of the large mammoth statue located in the same area. The concentration of memories and experiences in this location as well as the results from the tours confirmed the selection of this site as a memory point; we sought to include a majority of these key spaces in the panorama to serve as a connection between the Stellarium users and a familiar environment.

Figure 1. Phenomenology site map of the NTU Clifton campus based on tours and interviews.

Only two people participated in the second, more detailed open ended interview. These people were selected on the basis that they had a detailed knowledge of the campus, spent a lot of time on it, and had many personal memories and experiences in the surrounding environment. Unlike with the first, more general interviews, the prevalent feeling here was that the nature trail and the area surrounding the balancing pond (see figure 1) were very important memory points due to the natural phenomena based on the trail.

The results obtained from the tours and interviews were combined in a phenomenological map (see figure 1). This was created to display some key

findings to inform the final impressionistic panorama.

4.3 Light Pollution Survey

Figure 2 shows the results from the light pollution survey. Blacked out areas are inaccessible parts of the campus. The red parts indicate lower level light pollution.

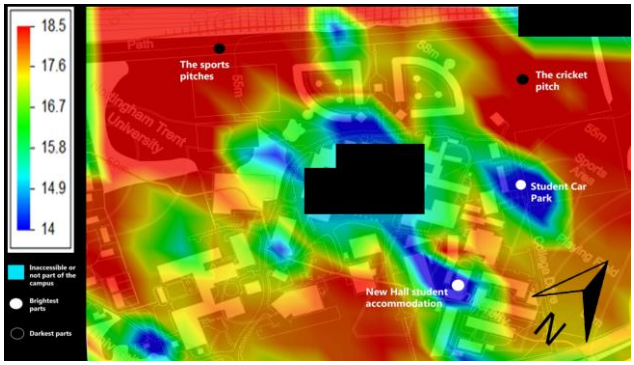

Figure 2. Light pollution survey map of the NTU Clifton campus. Blacked out regions were not accessible due to ongoing building works. Light pollution levels are colour coded with red being dark (18.5 mag) and blue being bright (14 mag). Key sites are indicated in the map.

As can be seen, the darkest parts of the campus are its western periphery. The Conflict Zone towards the West and the cricket pitch towards the North were the areas with the least light pollution. The middle of the campus, especially around the New Hall accommodation on the north-eastern side had high levels of light pollution due to the heavy lighting. The A543 road runs just beneath this image and its orange street lighting cast a strong glow over the campus's eastern edge. The bright spot on the lower left corner of this image is the staff car park which had very strong lighting. The Bortle Scale (Bortle, 2001) is used to measure the brightness of the sky and the visibility of the celestial objects. It is ranged from 1, the darkest level, to 9, the brightest. On average, the Clifton Campus, scored 7 on the Bortle Scale placing it in the suburban-urban zone with a strong glow. The results of the survey must also take into account the possible inaccuracies of the location where the reading was taken because of the inherent difficulty in relating the position of a point on the map to its actual location.

Furthermore, the results can only give a relative distribution of light pollution since the survey was carried out while no actual astronomical twilight was achieved during the night.

Figure 3. The Stellarium landscape for the ERD memory point. Note the additions of people, cows and the enhancement of the Mammoth and Atom sculpture, frequently referred to structures. The squares indicate intended alignments with relevant constellations such as the Crow over the cherry trees but also the Bull as a link to the initial pasture character of the site.

5. STELLARIUM LANDSCAPES

Photographic panoramas were taken at two sites. The first site was in the courtyard outside the ERD complex. In the foreground to the northeast is a small roundabout with a sculpture of an atom. In the centre of the roundabout is a small memorial stone to university alumni. Fruit trees grow in the roundabout which members of staff use to harvest cherries, also blackbirds and crows visit them in the spring and summer. This link was highlighted through alignment squares in the landscape through which the constellation of the crow rises. Its star myth (Staal, 1988 : 160) reflects the use of this part of the landscape. Visible to the east is the mammoth sculpture. Gravel extraction near the Clifton Campus revealed that in prehistoric times, mammoths wandered this site. The temporality was captured subtly within this site in the form of the memorial stone in the centre of the roundabout, cows seemingly wandering the site, and the mammoth sculpture to the southeast. These served to indicate deeper history.

Figure 4. The Stellarium landscape for the Conflict zone memory point. The conflict is also enhanced through the sharp black gates. Note the inclusion of the yellow breasted robin and blue dragon fly, as well as the intrusion of a building site. Here an alignment square indicates the rising of the constellation Fishes linking this part of the landscape to water.

On the southwestern corner of the campus are sports grounds. The sky is visible in all directions. Ringing the site from the southeast to its southwestern extremity and round to the north is the campus nature trail. Just beyond the campus boundary is the historic trail people took to reach Clifton Hall. The panoramas were taken on the southernmost football pitch. The foreground is largely featureless except for the assorted pitches to the north and northwest, all surrounded by metal fencing. To the north is the Peverell accommodation for students. The unfavourable hydrology of the site necessitates a balancing pond next to the Peverell accommodation. The sound of water is ever-present on this site. A water feature alignment square is included through which the water constellation of Fishes rises.

Three panoramas were taken on this site; during the day, at sunset and at dusk, capturing temporality. The daylight panorama captured students playing. Construction workers were also working. At sunset, there were no people present but several bugs. There were also far more birds present during the dusk and sunset panoramas.

6. DISCUSSIONS AND CONCLUSIONS

The main challenge encountered during this project was a site not populated by students. Carrying out the work during term time would have enabled us to explore the full student experience. Additionally, the site was undergoing intense building works as indicated by the inaccessible regions in the light pollution survey in Figure 2. These would have disrupted the flow of people and engagement in the site substantially. Therefore, the impressions captured of the NTU Clifton campus are only valid for this time period and not generalizable. However, this should always be noted during phenomenological work especially when including temporality.

A more methodological challenge was the engagement with the site occurring mostly during day time and the landscape reproducing temporal cycles only during night time. The project could have involved more in depth night time sky explorations. Furthermore, the temporality and place experience could have been enhanced through animation and sounds which is envisaged in later outputs of the project.

During the project the team also felt that deeper meaning of this site could not easily be conveyed through exact alignments. But capturing the impressions of the landscape aspect alone was more important to convey temporality and a deeper place experience. This impression could be a result of the missing night time sky experiences and indicate possible further improvements to this project.

Overall, the Skyscapes of Clifton project illustrated through the various ways of engaging in both deeper history of the site and the movements, emotions, and memories of users how skyscapes can be explored even in contemporary environments. Embracing the landscape option in Stellarium as a creative canvas to capture place experiences has been illustrated and vastly improved the engagement with a created Stellarium landscape.

This project is only the first step towards artists and creative practitioners exploring the use of Stellarium in their work. It also offers insight into how skyscapes are explored and allow the investigation of skyscape experience can be captured and communicated. Stellarium is only one way of accessing a skyscape experience. This approach has its challenges but also huge opportunities that should be explored in future.

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