SCOPIC REGIME AND ORGANISED WALKING – A TYPOLOGICAL STUDY ON THE MODERN MUSEUM

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The Spatial Implications of Social Concepts About Museums

Over the past two decades, a rich literature has emerged on the museum as a distinctive social phenomenon in modern society. The ideas and writings of social theorists Michel Foucault and Pierre Bourdieu have been highly influential on writers such as Eilean Hooper-Greenhill, Tony Bennett and Carol Duncan who have tried to focus on the social function of changes in museum design . Hooper-Greenhill's 1992 study 'Museums and the Shaping of Knowledge' analysed several European museums using Foucault's concept of epistemes, and the way the epistemes have shaped knowledge. According to her study on the Medici Palace (which has been regarded by other scholars as the first museum in Europe) there was a 'general epistemic field' functioning to articulate different aspects such as private domestic space, material things, wealth, patronage, mercantilism, a sense of the past, and the supernatural.[1] This general epistemic field included older practices, such as the amassing of bullion and medieval cosmology, and newer practices such as mercantilism. The architectural spaces, according to Hooper-Greenhill, are used to indicate wealth and status through the presence of luxury goods and the decorated surfaces of the rooms. Through the messages carried by the architectural spaces, the Medici Palace was constructing and glorifying the 'position' of the Medici family. Hooper-Greenhill further argued that the articulation of different aspects made

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[1] Hooper-Greenhill quotes F.H. Tayor, Alexander, and Alsop's studies to show how the Medici Palace is celebrated as the the identity of origin for European museums (Hooper-Greenhill 1992:23).

the space of the Medici Palace the identity and symbol of social hierarchy in feudal society, and that 'the first museum of Europe' was in fact 'the establishment of a position of superiority and exteriority through the display of wealth and status' (Hooper-Greenhill 92:72). Therefore, from Hooper-Greenhill's point of view, the architectural space of the museum is an embodiment of the meanings of objects, as arranged and interpreted in relation to epistemes.

Another Foucauldian scholar, Tony Bennett, has used concepts drawn from 'Discipline and Punish' (Foucault, 1977) to deal with the problem of the space of the modern museum. According to Bennett's 'The Birth of the Museum', the spatial functions of museums in the nineteenth century mainly involve two different, but interlinked ideas. The first is that, through the ideal of 'scopic reciprocity', museums, as well as international exhibitions and modern fairs, have 'regulat[ed] the conduct of their visitors'.[2] Quoting Mona Ozouf's study on the festival celebrating the French Revolution, Bennett makes the claim that the spatial function of museums in the nineteenth century is just like the festival: 'the new social bond was to be made manifest, eternal, and untouchable in allowing the members of society to be rendered visually co-present to and with one another' (Bennett 1995:50).

The space of museums in the nineteenth century therefore, for Bennett, is implicated in the apparatus of government and the construction of a social network of visibility.[3] When the museum was reconceptualised as a

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[2] According to Bennett's arguments, scopic reciprocity was a space apparatus which allowed visitors to inspect each other as well as 'a means of celebrating the citizenry's co-presence [...] In the museums that were custom built for their new public function, the same architectural principle recurs again and again. Relations of space and vision are organised not merely to allow a clear inspection of the objects exhibited but also to allow for the visitors to be the objects of each other's inspection.' (Bennett 1995: 51-2).

[3] 'Government' here is related to Foucault's idea of power. According to him, government 'designated the way in which the conduct of individuals or of groups might be directed -- It covers the modes of action which are destined to act upon the possibilities of action of other people. To govern, in this sense, is to structure the possible field of action of others.' (Foucault 1982a:221). For Foucault, power is not clearly directed to class oppression. It is not just rooted in political and economic materiality, but is exercised through a spatial technology which aims at a docile body. Therefore, from this perspective, Bennett's argument is in fact implying the spatial form of the modern museum as the apparatus of government.

public cultural resource in the nineteenth century, a new spatial form was devised to mix a previously differentiated public. In its openness, this new spatial form was actually an exemplary space in which 'the rough and raucous might learn to civilise themselves by modelling their conduct on the middle-class codes of behaviour to which museum attendance would expose them' (Bennett 1995:28). Consequently the museums, for Bennett, were like a nineteenth century version of the Panopticon – an architectural configuration of the new mechanism of power.[4] Through the surveillance provided by this kind of space, the possible field of action was structured and society was rendered transparent.

Another aspect of Bennett's idea of the spatial functions of the museum was concerned with the representation of space. The museum 'also constructs man in a relation of both subject and object to the knowledge it organizes […] Its space of representation posits man – the outcome of evolution – as the object of knowledge. At the same time, this mode of representation constructs for the visitor a position of achieved humanity, situated at the end of evolutionary development, from which man's development, and the subsidiary evolutionary series it subsumes, can be rendered intelligible.' (Bennett 1995:7). Bennett's argument here also relates to Foucault's study on the modern episteme. This study is mainly about the invention of modern history (a total history), and how historicity became a very important rule for humans to 'know themselves'[5]. What Foucault suggests is that

modern history constructs the human being as the object in the regularity of history, and at the same time the subject to construct this regularity. In other words, the human being is the 'subject' that is 'subject to' the self-knowledge and consciousness provided by the knowledge of modern history.

The move to constitute every individual as a subject, in the Foucauldian double sense, involved shaping the spatial layout of the museum, since the representation of the order of things in the modern epoch is characterised in a 'historicity', and a certain spatial form is inevitably employed to manifest this. For Bennett, this form has been the linear path of organised walking: the marking out of time as a series of stages comprising a linear path of evolution; the organisation of these stages into an itinerary that the visitor's route retraces; the projection of the future as a course of limitless development. In all these ways the museum echoes and resonates with those new institutions of discipline and training through which, in the construction of a series of stages that were to be passed through by means of the successful acquisition of appropriate skills, individuals were encouraged to relate to themselves as beings in incessant need of progressive development (Bennett 1995:46).

Besides Foucault, another social theorist who has been influential is Bourdieu. Bourdieu's study of art museums is a typical example in taking the museum as a site that reproduces class relationships in societies. In his field studies on museum visitors, Bourdieu observes that 'It is not infrequent that working-class visitors explicitly express the feeling of exclusion which, in any case, is evident in their whole behaviour' (Bourdieu 1993:298). [6] Through aspects of facilitation, for example exit signs and exhibit labels, as well as the exhibition, the museums actually function to distinguish

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[4] In his discussion about the three principles of exhibition architecture in the nineteenth century, Bennett argues that these principles 'allowing the public to double as both the subject and object of a controlling look, the museum embodied what had been, for [Jeremy] Bentham, a major aim of Panopticism: the democratic aspiration of a society rendered transparent to its own controlling gaze' (Bennett 1995:101)

[5] According to Foucault the modern episteme emerged at about the end of eighteenth century that was also the time museums became public. In the modern episteme, it is the 'historicity' within which man is involved which became the principal rule used to organize the order of things. Foucault argued that it was Georges Cuvier's 'fixism' that gave rise to this modern episteme, which 'was the earliest mode of reflecting upon that historicity'. Foucault believed that Cuvier had introduced a radical discontinuity of living form which made it possible to conceive of 'a great temporal current and to reveal a historicity proper to life itself.'(Foucault 1973:275). Through Cuvier's idea of function and his rigorous techniques of comparative anatomy, knowledge was transferred from the visible to the invisible. To know something now means to know things

in their context of time and function. (Please also refer to Charles Coulston Gillispie's 'The Edge of Objectivity' pp. 267-302 for Cuvier's idea of fixism.)

[6] This argument which appeared in Bourdieu's book published in English in 1993, is in fact based on his rather positivist study 'The Love of Art' in 1969 (English translation in 1990). In this study, through the investigation of visitors' attitudes towards the signs in museums (arrows and explanatory panels, etc.), Bourdieu argued that working-class visitors' preference for indication is a reflection of their fears about being confronted with objects unfamiliar to them. For Bourdieu, indication is not really a tool to aid visitors to understand the exhibits, but a proclamation of the right not to know. Without this facilitation, the working-class would feel like they are facing a test, one that would make them feel excluded.

'culture' from the daily life of the working-class. What Bourdieu is trying to indicate is that, because of its lack of symbolic power , the working-class is powerless in 'world-making' and culture-shaping. Symbolic power is based on the possession of symbolic capital. The unequal distribution of symbolic capital in social space is structurally reproduced in the museum experience of the working-class.

Consequently, the museum's true function for Bourdieu is to 'strengthen the feeling of belonging in some and the feeling of exclusion in others' (Bourdieu 1990:112, 1993:236). We have to note, however, that by making the working-class feel excluded it does not mean museums expel the working-class. On the contrary, museums after the nineteenth century have been endeavouring to mix the classes.[7] It can be said that one of the museum's functions is to manifest the social relationship between the working-class and the dominant classes. Through the sanctions of a certain type of 'cultivated person', the working-class is being unconsciously forced to imitate the dominant classes – their clothing, body gesture, language, etc. – in the public museum. A museum, according to Bourdieu, is actually a social space in which the working-class could be exposed to the improving influence of the dominant classes. The behaviour of imitation, from Bourdieu's point of view, not only operates as a symbol of recognition, but also as a symbol with social function – it forms parts of the symbolic system which legitimates the domination of class.

Bourdieu's view of space in museums is, however, rather more reliant upon studies of representation than of spatial organisation. It is not until his followers – such as Duncan – that aspects of spatial layout have been noticed in the sociological study of museums. Besides this, Bourdieu's criticism of the museum's re-enforcement of class structure has led to him being criticised as essentialist in his account.[8]

The recent development in sociological studies of museums has placed more and more emphasis on mobility rather than social function alone.[9]

Duncan and Alan Wallach, in their analysis of the Louvre, provide an example of a revision of Bourdieu's thought. In their study 'The Universal Survey Museum', they claim that the experience of a museum visit is exactly like a 'ritual walk'. Through the layout of rooms and the sequence of collections, the museum creates, they claim, an experience that resembles traditional religious experience. In the case of the Louvre, the ritual walk is organised through the spatial layout of the 'three great classical moments - Greece, Rome and the Renaissance'. This ritual walk, for Duncan and Wallach, serves to illustrate France as the true heir of classical civilisation, through which the national community and the citizenship of France is built and promoted (Duncan and Wallach 1980).

'National community' and 'citizenship' are recognised by Duncan and Wallach as part of the ideology of the nation state. This is reinforced through the ritual walk in public art museums that were born at the same time as the nation state. The ideology of the nation state, for Duncan and Wallach, is after all an illusion of a classless society. The function of the museum is to 'promote the visitor to identify with an elite culture at the same time to spell out his place in the social hierarchy' (Duncan and Wallach 1980:457). It seems therefore that the

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[7] Bennett's study on the history of the museum has also revealed this point of view. He thought, '-- the museum - in its conception if not in all aspects of its practice - aimed not at the sequestration of populations but, precisely, at the mixing and intermingling of publics - elite and popular - which had hitherto tended towards separate forms of assembly' (Bennett 1995:93).

[8] Gordon Fyfe's thesis 'A Trojan Horse at the Tate' is typical in attacking 'essentialism' in the sociological studies of museums. In his thesis, Fyfe argues that a museum is a relationship of cultural interdependence and not a creature of class power – 'Neither the essence of art nor the needs of capitalism were the points of origin of the Tate; rather the early Tate produced its point of view as a museum of

modern art through the contradictions of the cultural forces in which it was enmeshed' (Fyfe 1996:225). The 'essentialist' sees the museum's social function as being fixed by the interests of a dominant class. The view of 'mobility', on the contrary, stresses the shifting, unstable and contingent character of the museum's social function. According to the view of 'mobility', museum practices in the contemporary world are not consistent, rather, the shifting and unstable characters of museums has made the practice very idiosyncratic. Construction of new museum theories has, in my opinion, created a social space that allows museum curators to regard themselves as a subject in wider social action. It will be interesting to consider how this view had been integrated into the 'new museum movement' since1980 that attempts to escape from the structural constraints of the modern museum.

[9] For example, Fyfe considers museums as relations of cultural interdependence, they actually express the coincidences of an interweaving of power relations (Fyfe 1996:224). Daniel Sherman stresses the continuing transformation and construction of the museum and the ideology (Sherman 1987:54). Lavine and Karp in the 'Exhibiting Cultures', as well as Zolberg's studies on American art museums, focus on the idea that museums are a contested arena and forum, in which confrontation, experimentation, and debate take place (Lavine and Karp 1991, Zolberg 1981).

ritual walk of Duncan and Wallach is closely related to the function of the museum that was recognised by Bourdieu.[10]

Kevin Walsh, has also studied the spatial function of organised walking. His book 'The Representation of the Past' analysed the emergence of the museum as a part of the experience of 'modernity', rather than as an experience of the nation state.[11] Through the representation of the past, the museum functions to construct a new experience of time and space in modern society. The new experience of time is, according to Walsh, 'the capitalist time - a precise time, a time that flowed in linear progression.'(Walsh 1992:33). The time of linear progression in some way integrates large groups of people who are actually dispersed in terms of space. In seeing 'modernity' as an ideology and a systematic world-view, the development of time as linear progression is consequently regarded by Walsh as a false consciousness of history, one that serves as a disembedding force to promote the interests of capitalism at the cost of distancing people from 'place'. 'Such representation implied a control over the past through an emphasis on the linear, didactic narrative, supported by the use of object, which had been appropriated and placed in an artificial context of the curator's choosing.' (Walsh 1992:31).

To conclude the brief literature review above, there are two different kinds of thought that could be recognised as embedded in ideas about the spatial functions of the museum. The first analyses ideology to make sense of society. This method implies a 'subject' – whether a person such as a curator, or an institution, such as the museum or government – that controls systems of power so as to benefit certain social groups. The spatial function of the museum that this method can observe is the 'organised movement', which is regarded as an important function of space , because it allows the ideology of a dominant group to be manifested. The second type of thought uses Foucault's idea of power to explain the existence of contemporary society. Its tool is the diagram of the Panopticon, which allows no subject to emerge from the exercise of power. From the perspective of Foucauldian thought, what matters in contemporary society is the mechanism of the exercise of power in which everyone is involved. The spatial function of the museum is mainly focused on 'reciprocal surveillance', which is regarded as a spatial effect of keeping the social order. These two kinds of thought ultimately define what they can observe in the spatial form of the modern museum.[12] In order to investigate to what degree the spatial functions of 'organised movement' and 'reciprocal surveillance' can be realised and synthesised into the theory of spatial form, this paper then turns to discuss the works by architectural scholars. In the following, the paper will discuss the works by Thomas Markus and Bill Hillier, particularly focusing on their ideas about the social functions of spatial form..

In his studies of buildings, Markus distinguishes between 'solidarity' and 'power', which in this context refers to the distribution of finite resources. According to Markus, both power and solidarity relationships are made concrete through bodies in space – 'Space can be so linked that communication is free and frequent, making possible dense encounters between classes, groups and individuals. These are the basis for community, friendship and solidarity.' Power relationships, in contrast, are achieved mainly through 'movement control and surveillance' (Markus 1993:21-5). Communication for Markus is built on the basis of body encounter – the body through which solidarity is formed, the body by which the 'lifeworld' can be experienced. By proposing this ideal situation of communication, Markus is in fact suggesting that random movement of the body which can create a dense encounter between people within a building, as the social function of space. While it is implied that this constitutes freedom of space, and is the basis

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[10] However in Duncan's later work Civilizing Rituals she made a claim that her works are different with Bourdieu's. She said: 'I treat museums not only as socially distinguishing forms but also as structures with substantive cultural content, a content that is not always or not entirely subject to sociological or political description' (Duncan 1995:5).

[11] Here I would like to quote Walsh's definition of 'modernity' – 'An essential proposition of modern thought is an idea of progress, a belief which developed as a constituent part of Enlightenment thinking, and provided modern thinkers with a faith in the ability of humankind to manipulate and exploit their environments for the benefit of society. Such a society could escape from the debilitating elements of the past, and could move ever forward to new horizons. If modernity has a particular essence, it is a belief in rational advancement through increments of perpetual improvement.' (Walsh 1992:7).

[12] It is, however, possible to employ the two types of thought in one text. For example, Bennett's several works could be regarded as such an attempt to clarify and reorganise these two positions. See his discussions on Antonio Gramsci's position and Foucault in 'The Birth of the Museum' 1995 and 'The Exhibitionary Complex' 1996.

for constructing bond relationships, movement control is regarded as the opposite – that is, concerning power relationships.

Instead of distinguishing between social relations of power and of bonds, Hillier has approached the question of the social function of space by asking how spatial form could be recognised as a model. He recognises that the rules of a spatial model are equivalent to restrictions on an otherwise random generative process. This idea had already been developed in his earlier work with Julienne Hanson, 'The Social Logic of Space'. In his later work 'Space is the Machine' (1996), he used this idea to develop two different kinds of spatial model: the 'long model' and 'short model'. The difference between 'long' and 'short' here is the number of rules that can be imposed on the movement of the body through a spatial configuration. While the long model refers to the routine, ritual-like movement imposed by space, the short model describes the maximising of the random encounter of bodies by space. For example, a court and a church would most likely be a 'long model' space, with many rules to constrain movement; a party would normally be a 'short model' space that encourages the encounter of bodies.

The spectrum of the model Hillier provides in his work presents us with ideas about the description of the spatial form of the museum; ideas about how the description of space can incorporate the discourse of space. The social implications of space, the reciprocal surveillance and the construction of the knowledge of history, all take spatial form in order to be manifested. In other words, they could be described through a formal analysis: while reciprocal surveillance is caught up by the short model, the construction of history is seized by the long model. In Hillier's idea of the restriction of movement we therefore have a model for the description of the museum space. This model is made of two principles extracted from the long model and short model. One is concerned with the 'integration core', where the co-presence of bodies is maximised.[13] The other

is the strength of sequence, where the movement of bodies is constrained. The integration core and the strength of sequence are, therefore, the fields that the formal analysis of a museum space should focus on.

The Conceptual Framework and the Spatial Types of Modern Museums

The spatial layouts of the modern museum, according to the brief review above, are designed to organise visitors' walking so as to embody knowledge and, at the same time, to physically or virtually congregate visitors in order to form social relationships. These two different kinds of functions constitute the basis for the spatial types of modern museums. In other words, the spatial types of museums are the result of the relations between visitor and object, and between visitor and visitor. Two key themes emerge from the literature review:

(1) Organised walking: The spatial layout of buildings, including the modern museum, become devices for the classifying and mapping of knowledge. Through the regulation of visitors' movement, 'historicity' is manifested. By applying specific spatial arrangements single-sequence movement is organised to illustrate historicity. By such organisation, visitors' movements are controlled by the spatial organisation.

(2) The congregation of visitors: The spatial layouts of museums have a function in bringing visitors together. There is an 'integration core' which serves as a locus for the exercise of power and the formation of bonds. Through maximising visitors' encounter physically or virtually, different social

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[13] 'Integration core' is a technical term in space syntax. When using the method of space syntax, space is understood as a system constituted by two kinds of elements. The first of these is termed the 'axial line'. The axial line is drawn to indicate the relations between all the different spatial units in a spatial complex, in terms of their visibility and accessibility. The spatial system could therefore be represented as an 'axial map' where the longest and fewest lines of sight and access are drawn through all the spatial units. The second element used to

constitute the spatial system is that of the 'convex' space. The 'convex' is a spatial unit within which a 'diamond-shape' space is encapsulated. The 'diamond-shape' space describes the physical environment that allows people in it to see and to encounter each other simultaneously. The spatial system could therefore be represented as a 'convex break-up' where the largest and fewest convex spaces and the linkages between them are drawn to cover all the space. Moreover, each axis and convex are recognized as gaining different properties through the organization of the whole spatial system. As far as this paper is concerned, the degree of 'integration' is the most important property, among the different properties related to the movement of bodies. Put simply, the degree of integration theoretically indicates the relative intensity of usage in terms of movement. Highly integrated spatial units and axes thus constitute the 'integration core' in a spatial system.

relationships could be constructed and inscribed on bodies.

The two key themes above are in fact concerned with the spatialisation of the characteristics of modern museums that were purpose-built from the nineteenth century. The term 'modern museums' refers not only to their public nature, but also the historicity that is inscribed in their spatial layouts. Their spaces were therefore recognized as 'structured' by the interfaces between visitor and object and between visitor and visitor. The spatial types of the museum are recognised as the resolution of the two different kinds of spatial function surveyed above: congregation and organised walking. These two functions are related to the integration core and the spatial sequence respectively. Based on this idea, the paper will now seek to constitute a two-dimensional perspective of the question of spatial types by mapping two concepts of the social construction of space against two concepts of how space manipulates and controls social behaviour.

Theoretically the integration core is a 'convex space' [14] where the congregation happens. However, according to Hillier's arguments and Yoon Chung Choi's studies on the core, the function of maximising random encounters could be 'virtualised' and 'visualised' through the increasing depth of the core. Choi has pointed out in his work that 'the presence of people in the different museum spaces is not consistently related to the configurational properties of layouts [...] The number of people visible from a space, however, is very strongly and consistently correlated with the degree of integration of the space.' (Please see Choi 1991:86-9, also Chapter IX). In other words, what he found is that the integration core is not the space where the maximum number of people are present, but rather the space where the maximum number of people could be seen. According to his findings, visibility replaces permeability as the primary property of spatial integration. The integration core is no longer the space maximising random encounters, but the space maximising visual co-presence. However, Hillier has suggested that this phenomenon is due to the movement of the integration core. The integration core has become deeper and thus 'defunctionalised'. The 'virtualised' integration core, from his point of view, is the result of the growing depth of the integration core.

Hillier's inference about the relation between the depth of the integration core and its virtualisation could be supported by a brief review of Choi's empirical study. Among the eight cases Choi has selected, there are seven cases that are considered by him as significant in the correlation of the total number of people visible from each convex space with the integration value. According to the convex map of the integration core, there are five out of these seven cases that could be judged as a type of 'deep integration core'. These five cases also show no correlation between the number of people observed in each convex and the integration value. The depth of the integration core, therefore, marks a different degree and kind of co-presence – while a shallow core produces the maximum physical encounter through movement, a deep core produces the maximum virtual encounter through visibility.

According to Anthony Giddens, co-presence is 'being with others', which implies a face-to-face encounter and communication through the body. The situation of co-presence exists where people's behaviour is shaped by the encounter of bodies. Hillier has further referred to 'co-presence' in a visual dimension; he considers the 'virtual community' as constructed by visual co-presence. It concerns our awareness of others and communities. According to his arguments, the pattern of co-presence and co-awareness are affected by the pattern of space (Hillier 1996:187,378-9). It is from these points of view, this paper considers, that the formation of social relationships are related to the different kinds of encounter in the integration core which, interestingly, could imply different bodies.

The second dimension of the spatial types of the modern museum is organised walking – the strength of the single sequence. The basic spatial logic of the single sequence, for the convex space unit, is of 'one way in, one way out'. Visitor movement is constrained in the convex spaces of single sequence without an alternative. To measure the strength of the single sequence, this paper proposes to simply calculate the proportion of the 'two-entry' convex spaces in the spatial system.[15] Due to

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[14] Please see note 13 for the meaning of this term.

[15] The strength of the single sequence, according to Pradinuk, could also be measured by the 'mean RRA value' of the spatial system. 'The higher the mean RRA value - the deeper the system – the stronger it is framed.' (Pradinuk 1986:16). This is basically because the higher the proportion of the 'two-entry' convex, the more asymmetric

the fact that the 'one-entry' convex normally functions as an 'attachment' to the convex space which is connected to it, when calculating the proportion of the two-entry convex the 'one-entry' convex can be ignored. The proportion of the 'two-entry' convex, which indicates the strength of the organised walking, thus constitutes the second dimension in the spatial types of the modern museum.

Together these two dimensions constitute a two-dimensional model of the distribution of the spatial types of the modern museum. The spatial types of the modern museum, based on these arguments, are distributed in the quadrants of integration core and sequence. The different spatial types of the modern museum can be regarded as the result of resolutions of the 'genotypical conflict' that derives from the different functions of the museum. It is a 'genotypical conflict' for the following reason: to physically congregate people a museum needs a shallow integration core, which means a 'symmetric spatial system' is needed. In contrast, to organise visitors' movement in a strong sequential plan (and so represent 'historicity') there is a need for an 'asymmetric spatial system'. Answering how best to deal with these two different and conflicting functions has deeply structured the spatial design of museums.

As for an initial study of the space of modern museums, this paper selected fourteen museums for the analysis of genotypes. The cases are selected according to several principles. First, most of the cases are purpose-built museums and have close relationships with the state. Second, their scale is relatively large compared with privately founded museums. Third, they are picked from different times and countries to represent as widely as possible the genotypes of 'public museums' in various cultures. These fourteen cases are: the British museum in London, 1827; the Crystal Palace in London, 1851; the Natural History Museum in London, 1871; the National Museum of Natural History in Washington D. C., c.1900; the Field Museum in Chicago, c.1890; the National Gallery of Art in Washington D. C., 1937; the Air and Space Museum in Washington D. C., 1975; the National Museum of Modern Art in Paris, 1985; the National Museum of Natural Science in Taichung, 1993; the Alte Museum in Berlin, 1823; the Guildhall Museum in London,

1872; the Museum of London in London, 1970; the Durand's project in France, 1803; and the Alte Pinakothek in Munich, 1826.

The analysis of these cases is partly based on the use of the 'pesh'. The pesh is a calculation of the degree of integration of the convex spaces and axes within a spatial system, based on the method of space syntax developed by Bill Hillier, Julienne Hanson and their colleagues. According to the differing degree of integration, the convex spaces and axes in a spatial system are ranked as seven different bands that are respectively represented by different colours. (see *Figure 3*). The red areas indicate the most integrated spaces and axes and then, passing through orange, yellow, green, blue, indigo, to the purple colour, the pesh indicates progressively more segregated areas. The pesh is the most efficient way to identify the depth of the integration core, which is one of the dimensions of the genotypes of museum. In this paper the pesh diagram provides us with a 'sketch' of the spatial organisation of selected museums. As mentioned, the integration core is theoretically recognised as the most frequently used space and axis in terms of visitor movements within the museum, it is represented by red in the pesh diagram.

The pesh software must calculate both the convex spaces and axes at the same time. The integration core of the pesh diagram therefore could include both of them. However, the axes are treated in the same way as the convex spaces when calculated by pesh, thus they would overlap with the convex spaces where the axes pass through. In order to find the accurate integration core, which is considered by this paper as created by the arrangement and connectivity of the convex spaces, the axes in the pesh diagram are ignored. Therefore, the integration core in this paper only refers to the most integrated convex spaces in a spatial system. After eliminating the axes, we can roughly identify the most integrated convex spaces by their colours and then have the diagram of the position of the integration core as shown in *Figure 1* [please see the Appendix for *Figures 1-4 – Ed.*].

The depth of the integration core, as discussed below, equals the length of the entrance relative to the 'centre of gravity of the integration core' (CGC) in a spatial system. The depth of the core could be measured by the distance between the CGC and the entrance divided by the area of the whole spatial system. As far as this paper is concerned, the depth of

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the spatial system becomes. These two methods of measuring would, in this thesis' opinion, both do the job of quantifying the strength of sequence.

the core and the distance between CGC and the entrance can be measured visually.

In order to compare the depth of the integration core, *Figure 1* sketches the pesh, which shows the order of the selected fourteen cases in terms of their depth. Excluding the five museums in mainland Europe and Taiwan, the integration cores of the nine museums in Britain and the United States generally became deeper as time went on. For the selected cases, there was a trend of 'outside-in' movement of the core. The integration cores were more and more enclosed by the other exhibition spaces in the museums.

Due to the power of encounter's being replaced by the power of visibility in the deep core, the phenomenon of 'transparency' appears in terms of visibility in the core. As Colin Rowe has pointed out, 'transparency' is an important property in Le Corbusier's works (Rowe 1976, Rowe and Robert Slutzky 1976, Kenneth Frampton 1980: 157-8) and, according to *Figure 1*, the selected museums in Britain and the United States share this property during the twentieth century. We can infer that, for the selected cases of the museums in Britain and the United States, the spatial constraint on bodies has been transformed from physical encounter to scopic regime by the beginning of the twentieth century.

Concerning the strength of organised walking, *Figure 2* shows the 'j-graphs'[16] of the Museum of London, the Natural History Museum in London, and Durand's museum project. By using this method of calculating the proportion of the 'two-entry' convex, the strength of these three museums are respectively 0.740, 0.735, and 0.356. According to the same method, we can see, in *Figure 3*, the order of the strength of sequence for all fourteen museums. The depth of the integration core and the strength of sequence constitute the two-dimensional grid of museum genotypes. Data from *Figures 1* and *3* could, therefore, be expressed by a grid, as appears in *Figure 4*.

As a specific kind of museum, the modern museum could employ different genotypes that have been distributed in different times and spaces. According to *Figure 4*, there is a

phenomenon of 'uneven development' of modern museums around the world. This 'uneven development' not only refers to the uneven distribution of genotypes in terms of time and place, but also indicates the different kinds of design that are the results of dealing with the 'genotypical conflict'. As this paper has mentioned above: a symmetric spatial system is required to congregate people, an asymmetric spatial system is required to organise movement. The conflict between symmetric and asymmetric is mainly caused by the control of permeability that affects the spatial system. How this underlying conflict is dealt with – the degree of control – eventually defines the spatial types of the modern museum. Through this idea and the space syntax method, this paper can therefore construct a model of genotype that is able to describe the spatial form of the modern museum.

Conclusion

As we can readily observe in contemporary society, especially in recent decades, museum buildings are now very diverse. Places, factories, schools, theatres, military camps, and even prisons can be museums provided they are properly rebuilt. In this sense, the museum seems to cross over different ranges of building types and, as a result, might seem to become ambiguous and difficult to identify in terms of a particular spatial type.

This paper has sought to describe spatial types through the literature review on museum studies and by applying space syntax method. It is argued that there emerge two key themes that can be recognized as the two typological themes of the museum types. The first of these is to control visitors' movement, the second is to congregate visitors. These two themes are supported by the evidence of spatial configuration: movement control is supported by sequence;; congregation is supported by the integration core. The different degrees of movement control and congregation thus constitute a two-dimensional grid of museum genotypes as *Figure 4* has shown.

The description of the spatial types of modern museums is, however, not an attempt to construct an all-encompassing encyclopaedic account of the development of museums. It is not the author's intention to explain the development of the spatial types of modern

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[16] According to Hillier and Hanson, 'j-graph' is a justified spatial map in which circles represent spaces and lines their permeability. All spaces of the same depth value are lined up horizontally with the lines representing direct permeability between spaces drawn in. For detailed explanation of this term please refer to Hillier and Hanson 1984, p.147-9.

museums in a simply chronological way – at least, this could not be done here in any interesting sense. The spatial types are, for this paper, ideas with which to handle the possible variations of various spatial organizations. What is of interest, is how the different spatial types can be linked to the formation of society, as some scholars have claimed. The study has shown how the 'scopic regime' and 'organised walking', which are related to some scholars' ideas about the formation of modern society, can be realised as the effects of the different spatial organisations. It is in this respect, as Hillier has pointed out, that different social formations make use of spatial configurations to give a picture of themselves in space and time (see Hillier 1996: 395).

Acknowledgements

Appendix

Figure 1: The depth of the integration core

Figure 1:
The depth of the
integration core

■ Integration Core
▶ Entrance
◉ Centre of Gravity of the Core

British Museum, London.
1827

Crystal Palace, London. 1851

NHM, London. 1871

NMAA, Washington D.C. 1881?

Field Museum, Chicago. 1890?

National Gallery of Art,
Washington D.C. 1937

Air & Space Museum, Washington D.C.
1975

NMMA in Pompidou Centre, Paris.
1985

NMS, Taichung. 1993

Altes Museum, Berlin. 1823

Guildhall Museum, London.
1872

MOL, London. 1970
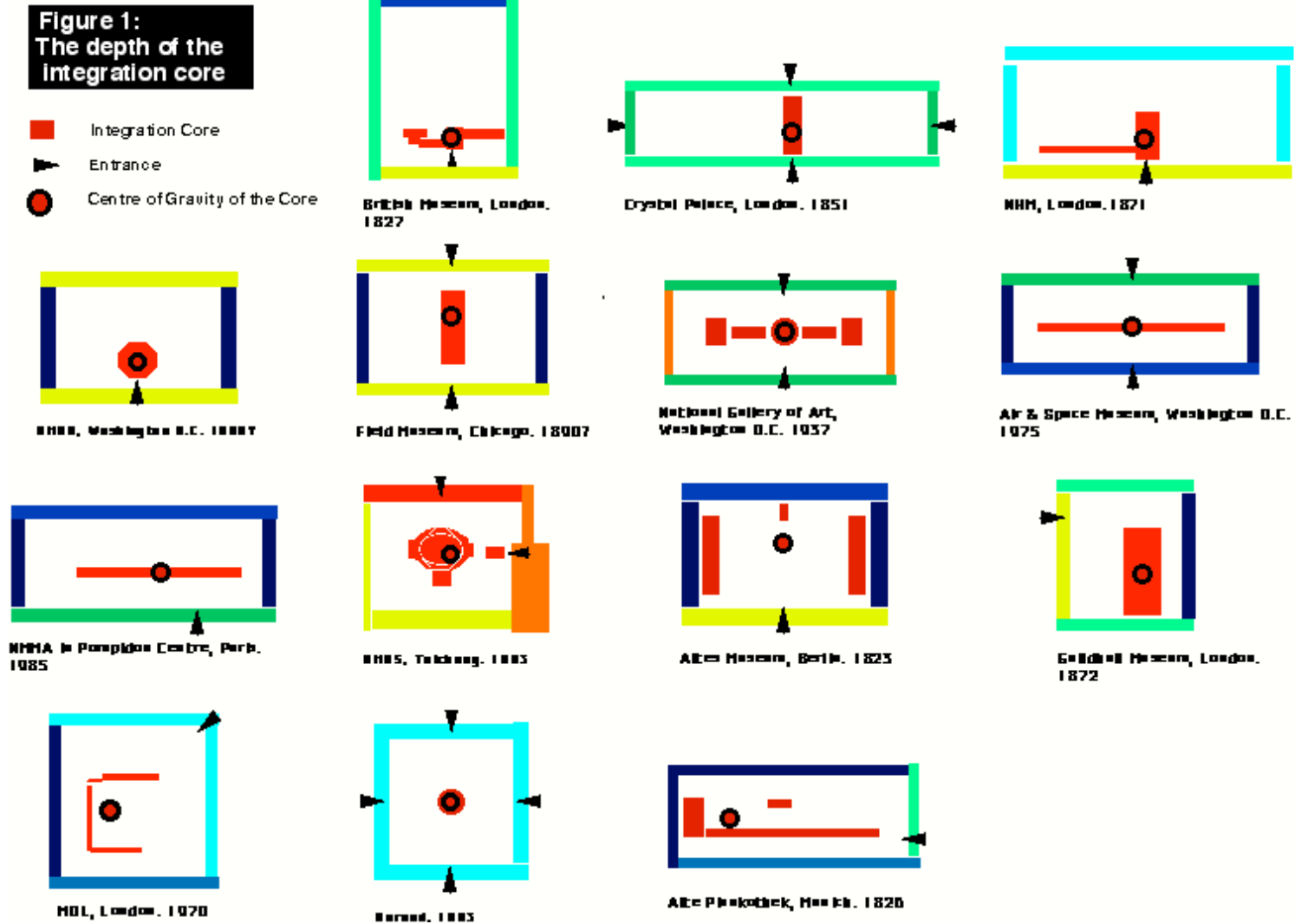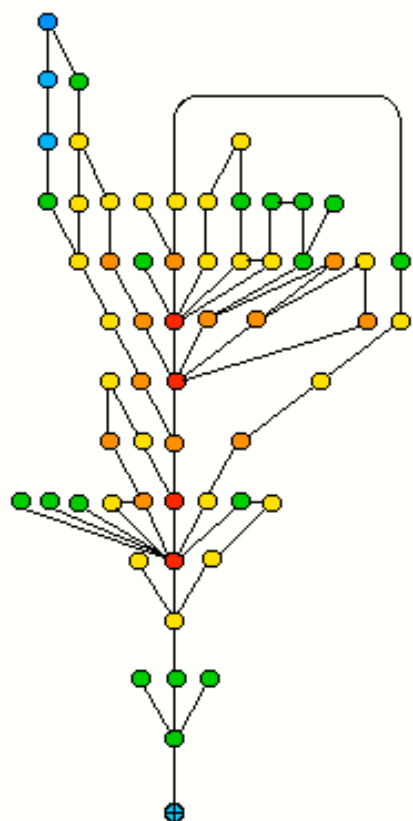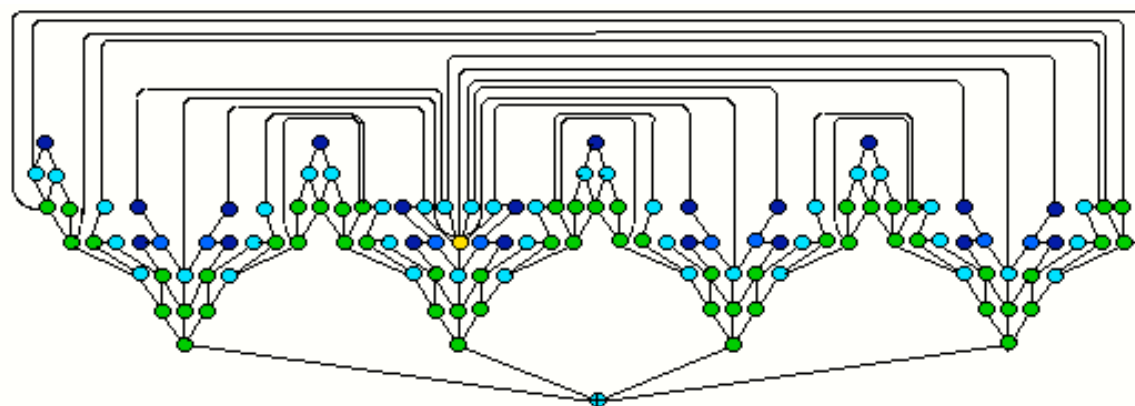
Borned. 1993

Alte Pinakothek, Munich. 1820

Figure 2: The strength of sequence (MOL, Durand, NHM)

Figure 2:
The strength of sequence
(MOL, Durand, NHM)
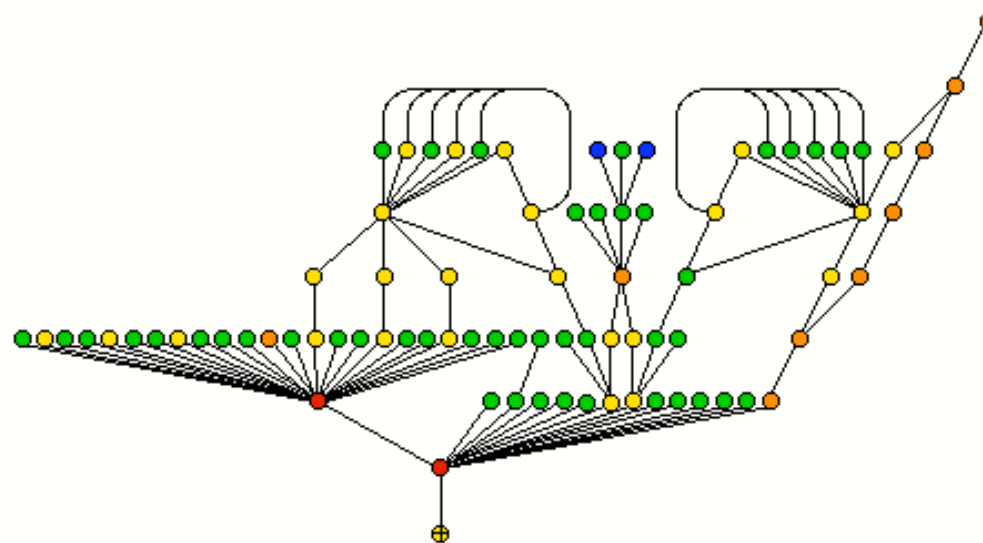
Strength of sequence = 44 / 125 = **0.356** (Durand, 1803)

Strength of sequence
= 37 / 59 - 9 = **0.74**
(MOL, London. 1970)

Strength of sequence = 30 / 82 - 41 = **0.60**
(NHM, London. 1871)

Figure 3: The strength of single sequence

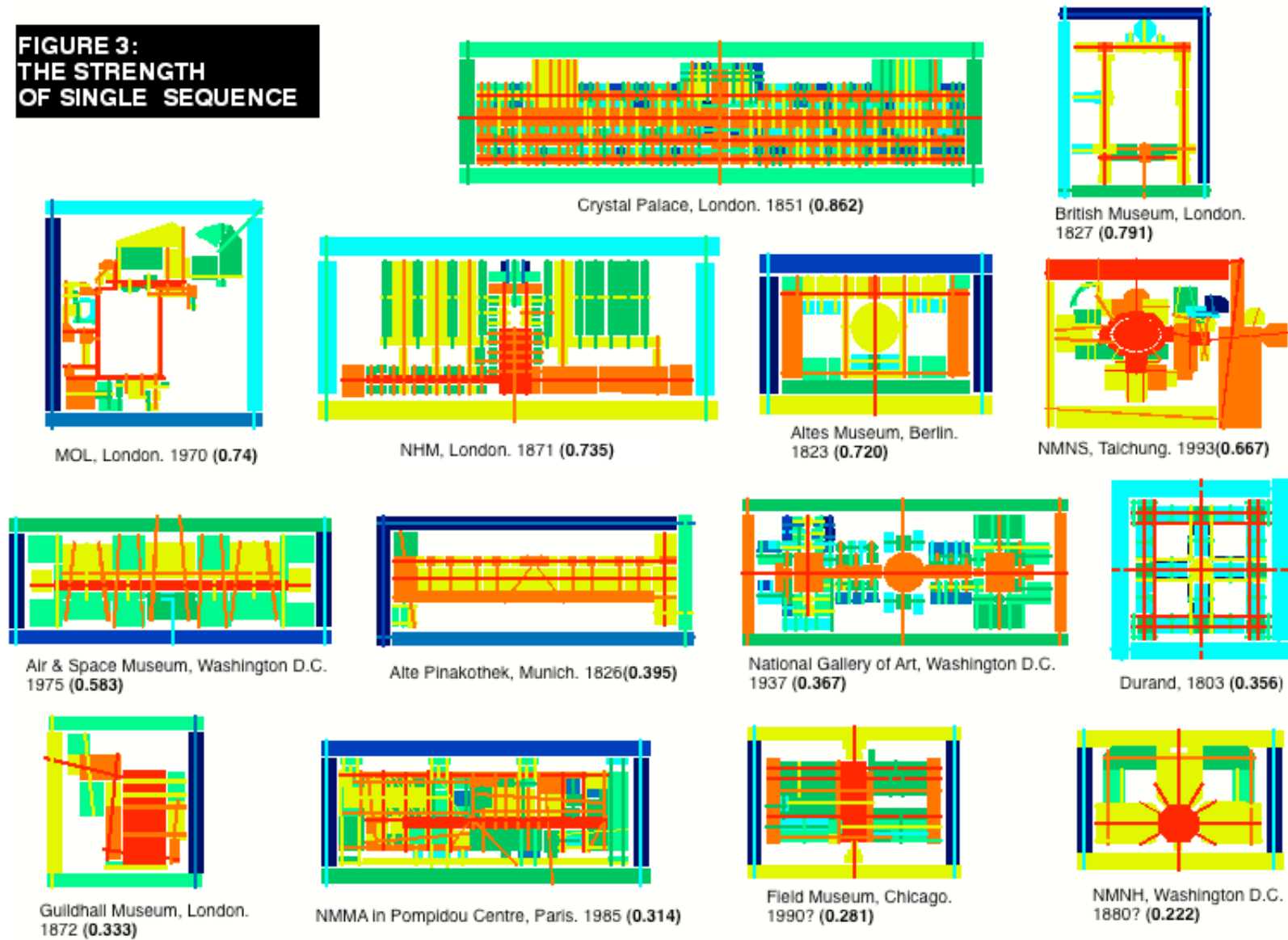FIGURE 3:
THE STRENGTH
OF SINGLE SEQUENCE

Crystal Palace, London. 1851 (**0.862**)

British Museum, London. 1827 (**0.791**)

MOL, London. 1970 (**0.74**)

NHM, London. 1871 (**0.735**)

Altes Museum, Berlin. 1823 (**0.720**)

NMNS, Taichung. 1993(**0.667**)

Air & Space Museum, Washington D.C. 1975 (**0.583**)

Alte Pinakothek, Munich. 1826(**0.395**)

National Gallery of Art, Washington D.C. 1937 (**0.367**)

Durand, 1803 (**0.356**)

Guildhall Museum, London. 1872 (**0.333**)

NMMA in Pompidou Centre, Paris. 1985 (**0.314**)

Field Museum, Chicago. 1990? (**0.281**)

NMNH, Washington D.C. 1880? (**0.222**)

Figure 4: The selected sample on a two-dimensional grid of museum genotypes

(+) The strength of sequence

(+) The depth of core

(-) The depth of core

(-) The strength of sequenc

■ : Museums in Britain ● : Museums in the United States ▲ : Museums in Europe and elsewhere
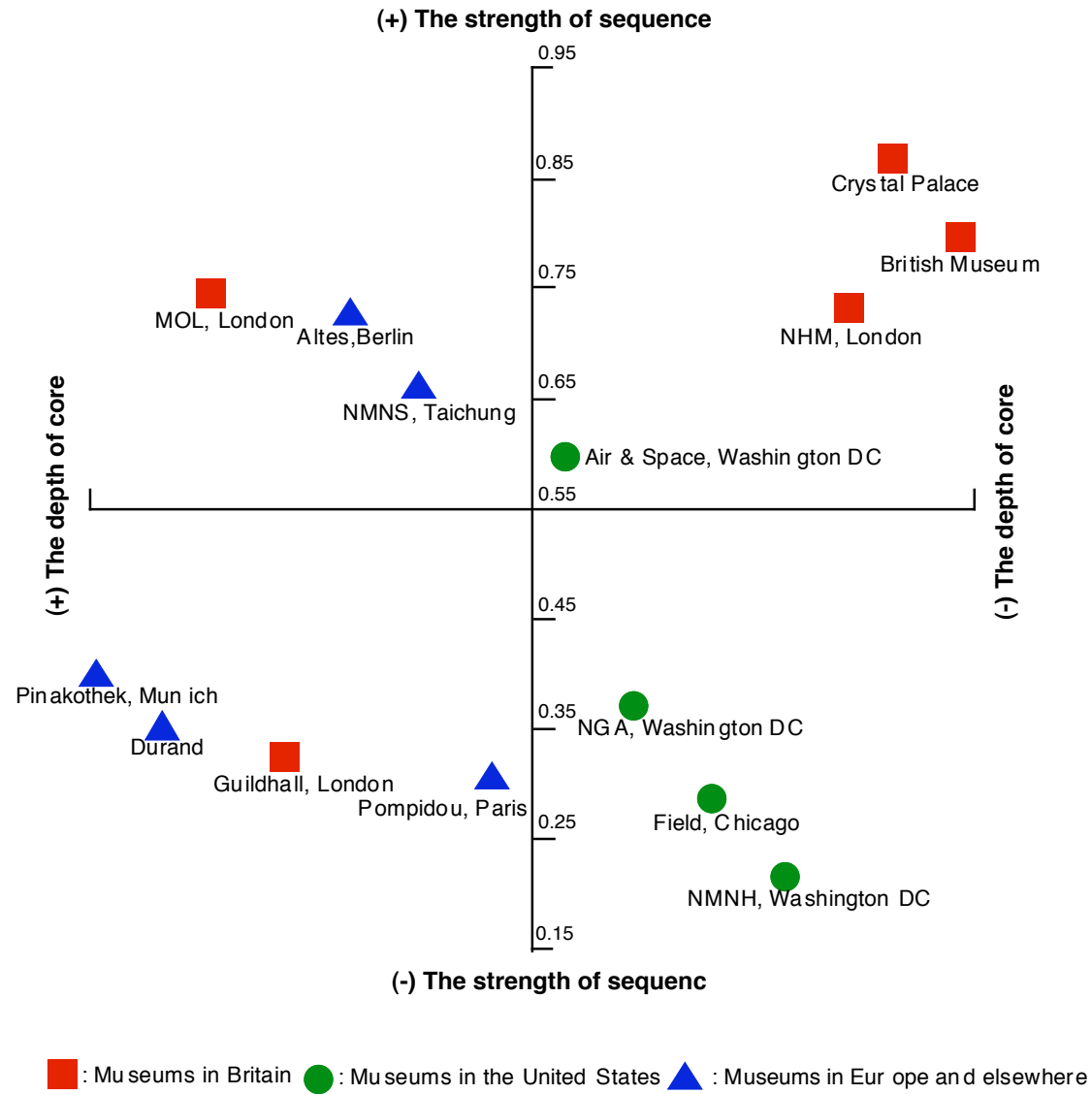
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