Rethinking genotype: Comments on the sources of type in architecture
Response to Julienne Hanson’s ‘The anatomy of privacy in architects’ London houses’ (1998)

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Two findings from Hanson’s ‘The anatomy of privacy in architects’ London Houses’ are taken as a point of departure for an exploration of the genotype/phenotype distinction in architecture. In the first part of the paper, the definition of genotype within space syntax literature is reviewed, the problem of ostensibly typological buildings not showing expected genotypical consistency is described, and two approaches developed to address it partially are discussed. This leads to a reconsideration of the biological origins of the genotype-phenotype distinction, and to the recognition that the two terms refer to different types, each identified by traits resulting from causally distinct pathways. In the final, speculative, part of the paper, it is suggested that this principle might be fruitfully applied to architecture as well, and that analogous to the concepts of genotype and phenotype in biology, one might propose the presence of two causally distinct conceptions of type in buildings: ‘sociotypes’ and ‘stylotypes’. The concept of stylotype, it is suggested, might help explain the distinctive spatial qualities that architects bring to their designs.

Keywords:
Typology, phenotype, sociotype, stylotype, imaginative function, design description

1. Architects’ houses

Amongst Julienne Hanson’s many contributions to space syntax, the most distinctive are her attempts to characterise what is ‘architectural’ within the more general domain of building design. There is always a danger of some circularity in addressing this issue, since the characterisation itself is a means for making the distinction between architecture and building in the first place. It is a sign of Hanson’s intuitive sharpness, and something to learn from, that she neatly circumvents this danger by choosing to work with concrete case studies where this distinction can be mapped onto unambiguously defined categories. In ‘The anatomy of privacy in architects’ London houses’, she sets up a comparison between houses that architects have designed for themselves, and those that were constructed for speculative purposes by builders as explored in her chapter ‘Shaping the taste of middle England’ in the same book (Hanson, 1998). Set up in this way, the comparison avoids obvious traps. For instance, it is quite possible for the houses constructed for speculative purposes by builders to be designed by architects, so merely the involvement of architects could not be the criterion of distinction. The distinction in Hanson’s paper, instead, is made on the basis of intentions – the bespoke house designed for one’s own self against the house designed for a generic user – and this criterion allows the comparison to directly address what quality architects bring to their designs that the market does not identify. A premise embedded in her study, one should note, is that such a quality would be manifest in the spatial organisation of the house.

Of the many theoretical and methodological insights in the paper, I want to pick upon two discrete findings in my response: the first, the finding that leads to her main claim about how architects’ houses differ from builders’; and the second, a finding on the genotypical patterns observed in her sample. Both these points have implications that go beyond the immediate subject at hand.

The first point concerns the kind of differences that Hanson finds between architects’ and builders’ houses. These differences, she observers, are
not large enough to support the hypothesis that architects belong to a distinctive sub-culture of their own (Hanson, 1998, p.236). But the differences are still of interest. The architects' houses that she considers – a sample of eighteen, drawn from thirty houses presented in Miranda Newton's *Architects' London Houses* (Newton, 1992) – have an average area of 220 square meters. The range, however, is quite large, varying between 70 square meters, and 450 square meters. In comparison, she says, not only is the typical speculative house available in the London market of this time, much smaller at an average size of 75 square meters, even the higher end speculative houses are rarely more than 175 square meters. The larger area of the architects' houses does not, however, translate, as one would expect, into a greater number or variety of actual rooms. Convex partitioning of houses results in two kinds of constituent spaces – fat spaces associated with 'static occupation' (presumably routine spatially localised activities like dining, sleeping, reading, cooking) and long spaces associated with circulation. When such spaces are tallied for both architects' and speculative houses, the numbers of use spaces are surprisingly similar (11 average spaces for architects' houses versus 8 for speculative ones), at least in comparison to transition spaces (14 versus 4); the average space: transition ratio in architects' houses is 0.79, which is about half of that for the speculative house (1.46). If, however, the houses are partitioned into boundary spaces (spaces created simply by shutting all doors, thus producing rooms that correspond with activity labels, but are not necessarily convex), the number of rooms in both populations is found to be similar – around 10. Hanson reads these data as showing a structural difference between the two populations. In the speculative houses, the boundary and convex space maps are very similar; the boundary spaces are essentially simple convex spaces connected directly to each other through doors. In contrast, non-convex boundary spaces are a regular feature of the architects’ houses. Many of these, if one scrutinises the house plans and the analytical drawings that Hanson provides, can be seen to convexly fragment into a set of interconnected lobbies and corridors; a few are associated with use spaces. In short, the architects' houses are larger in area on average, but the greater area is not so much the result of 'adding more rooms to contain proliferating household functions' (Hanson, 1998, p.236), but rather a matter of more elaborate investment in transitional zones between use spaces.

The second point has to do with Hanson's attempts to find one or more consistent genotypical signatures within the sample of the architects' houses. She finds, however, that there are none. In these houses, she writes, 'the rank order of the integration of living functions of the eighteen houses exhibits almost no duplication. This is not the case with traditional and vernacular sample of plans which, as we have seen in earlier chapters tend to be consistent in their configurational features to the point that this becomes the primary means to detect the imprint of culture on house form.' (*ibid.*, p. 235). Taking this lack of consistency in her stride, Hanson goes on to describe other findings of interest, in particular, the ones I described above. But it is worthwhile, I think, to give some more thought to this observation. Although, not of immediate consequence in the context of the Hanson paper, it is a result that is often observed in other studies, and, I suspect, is symptomatic of the current state of beliefs and understanding about this interesting concept in space syntax; I want to take the opportunity to revisit the issue.

In what follows, I plan to delve a bit more into the idea of the genotype as it has come to be used in space syntax studies. I will consider the apparent reasoning and logic behind invoking this biological metaphor – a very productive and insightful one, as anyone familiar with space syntax literature might
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note - and discuss briefly a couple of attempts to extend it both operationally and theoretically. Consideration of the original biological context, however, will lead us to reconsider the notion that the difference between genotype and phenotype represents a type-token distinction, but also offer a principle on which such a distinction might be formulated. From this point on, my paper will take on a more speculative note, as I offer suggestions about the ways in which one might extend the exploration of ‘type’ in architecture. I will return to the first, and major, point in the Hanson paper, which locates the principal generic difference of the architects’ houses from their speculative counterparts in their elaborated interfaces between use spaces. I will argue that the Hanson finding calls for extending the definition of type to one with stylistic origins, in addition to that with origins in social function, and that such definitions can lead syntactical theory to a more inclusive account of architecture.

2. The Genotype in Space Syntax Literature

The idea – more of a practice now – of using the ‘rank order of integration [values] of the living functions’ as an indicator of a genotype, seems to have been first presented formally and empirically verified in ‘Ideas are in things’ (Hillier, Hanson, and Graham, 1987). The term genotype was already in circulation in space syntax literature, and the idea of an ‘inequality genotype’ in terms of ‘relational differentiation of functions’ suggested in Hillier, Hanson, and Peponis (1984, p.65), but the 1987 paper presented a more straightforward operational definition:

‘If numerical differences [integration values] in functions are in a consistent order in a sample, then we can say a cultural pattern exists... This particular consistency in spatial patterning, we call inequality genotype.’ (Hillier, Hanson, and Graham, 1987, p.364)

Reading the paper, one finds the definition reassessed a little later, but this time sharpened with two critical distinctions that are worth noting:

‘The house-by-house review suggests that although there is no obvious single house “type” in the sample – defined perhaps as a more or less standard way of constructing the house and arranging its rooms - there is evidence of at least one functional-spatial “genotype” – defined in terms of relational and configurational consistencies which show themselves under “phenotypical” arrangements.’ (Hillier, Hanson, and Graham, 1987, p.379)

The two distinctions are those between ‘type’ and ‘genotype’, and between ‘genotype’ and ‘phenotype.’ Understanding these terms helps to see that the idea was introduced in order to solve a practical problem, but one with some theoretical motivations: it is a demand of space syntax theory – of the theory of the social logic of space – that there be a systematic description of type, since buildings that house distinct social institutions should, by definition, constitute a distinct formal class reflecting their shared social function. It also follows from basic space syntactical premises that this social function of the building be found expressed in the spatial configuration. Descriptions of type that were routinely advanced in architectural literature on typology during the late 1970s and much of the 1980s, by the Neo-Rationalists (notably, Rossi, 1982; see Moneo, 1978, and Bandini, 1984 for historical overviews) were clearly not descriptively precise enough to do the job; they did not offer any way to distinguish classes of buildings according to their social function. But it is also true that just reducing the buildings to a graph of their spatial configuration would not be sufficient, for even if the graph distilled out some of the socially significant aspects of the social relationships, one would still need some systematic way to distinguish the variation between individuals that belong to the type, and identify those aspects of the graph that were typological. The problem was identified in the
early formulations of the space syntax theory (for instance, Hillier, Hanson, and Peponis, 1984), and one answer, proposed in ‘Ideas are in things’, was, as we have seen above, that while the graphs of individual buildings belonging to a particular type would vary, the ranking of spaces according to their integration values would be more consistent, and so more indicative of underlying social type.

It is important to note that Hillier, Hanson, and Graham (1987) are careful not to equate either the graph or the rank order of spaces itself with the genotype; rather they speak of ‘genotypical tendencies’ (ibid., p. 382, p. 385) of which the rank order is one feature, and treat the spatial configuration not so much as a fixed expression of social organisation, but as a device through which standard relationships between categories of inhabitants can be dynamically negotiated (ibid., p. 385). But the argument that an underlying functional genotype results in a consistent rank ordering of integration values of functions is presented as being obvious, and not formally demonstrated. The problem is that buildings belonging to the same class or type in the social sense (single family houses from a region, for instance) will invariably have minor variations in their relational structure (that is, in their convex space access graph) due to incidental factors, and we need some systematic principle to sort out such incidental variations from those that point to actual differences of type. The assumption in the definition of inequality genotype is that only the typologically significant variations in access graphs will actually disturb the integration value rank ordering of functional spaces. This assumption makes intuitive sense, but to be of practical use needs systematic verification, either through a mathematical argument or through empirical simulation studies. Lacking such formal demonstration, when one encounters the lack of a consistent rank ordering pattern within a sample of buildings, as Hanson does in ‘The anatomy of privacy in architects’ London houses’, one cannot logically infer that a genotype is absent, for it may be possible that minor variations in the access graphs may have altered the rank ordering without necessarily changing the functional implications of the house layouts in a drastic way.

Although no one has yet attempted such a formal proof, some authors have tried to address the issue indirectly. One approach has been to actually quantify the similarity between access graphs of two buildings. In 2007, Conroy Dalton and Kirsan developed a procedure for comparing graphs using a graph-matching algorithm, analogous to the standard string-matching algorithms. This approach produces a numerical index whose value is directly associated with the number of steps one would require in order to convert one graph into another (Conroy Dalton and Kirsan, 2007). A set of graphs closest to each other can then be isolated as belonging to particular genotypes, for instance, by using standard statistical techniques such as cluster analysis; the graphs themselves are described by the authors as being ‘genotypical signatures’. The value of this technique is that it lets the general classes emerge naturally from the data, but my own sense is that what Conroy Dalton and Kirsan are capturing here is better described as the prototype, rather than a genotype. The difference is that where the concept of genotype refers to a core set of attributes which are shared amongst all members of a class and which help define it (although, as we shall see later, even this definition requires some further qualification), the concept of a prototype (originating in some highly influential studies in human cognition by Eleanor Rosch and her colleagues in the 1970s [Rosch, 1978]) refers to an individual that exemplifies a class without completely defining it, so that it may otherwise include quite a varied collection of individuals. The class of birds, for instance, includes a sparrow as well as an ostrich and a penguin, but human subjects tend to consider the sparrow as a more representative example of birds as compared
to the other two. The open-ended, graded system of classification of classes with more and less central members of what is now called ‘prototype theory’ was initially formulated to explain the structure of folk taxonomies, and arguments for it are based in basic human cognitive capacity (D’Andrade, 1995). Conroy Dalton’s and Kirsan’s work, thus, seems to open the door to an entirely new way of thinking of typology of buildings – one that would be grounded more directly in human cognition. And although the combination of computational and empirical work that it calls for goes beyond the scope and relevance of this paper, it is to be hoped that many will feel challenged to take it up.

Another approach to the problem of lack of consistency of rank ordering in buildings assumed to belong to a type is suggested by set of studies of early twentieth century German *Landhäuser* (suburban villas) conducted by myself (Bafna, 2001; 1999). What I suggested, first, was that the integration values of function spaces in individual houses be treated, not as absolute values, but as statistics from which one could estimate parameter values that represented the actual integration values of the functions. If given two populations – in my case the houses designed by Mies van der Rohe, and those designed by his contemporaries – the differences between the parameter estimates of their function spaces could be compared, using standard statistical procedures, to test whether the two values came from distinct populations (and so from distinct genotypes). But while this procedure could compare the rank ordering of estimated integration values of functions in houses drawn from two distinct populations, it could not be used to actually prove the existence of (or the absence of) a genotype from sample drawn from a single population. This is because, given any random sample of houses, one can always estimate a specific rank ordering of estimated values. In order to address this problem, I proposed a hierarchical conception of a genotype.

The argument was that individual function spaces in a house should be seen as constituents of a larger entity (a cluster). A cluster was not merely collection of individual spaces, but had a structure of its own, consisting of specific arrangements of use, circulation and service spaces. The cluster was itself a functional entity; that is, it corresponded to specific functional categories (bedroom cluster, or reception room cluster), so one could define each house as a specific configuration of basic clusters without specifying the actual internal structure of the clusters. I argued that the spatial configuration of clusters be considered as defining the genotype, since each house in my sample shared this basic configuration of functional entities, and since adding or removing individual spaces within the clusters did not disturb this basic configuration; the hierarchical conception of the genotype, in other words, was able to systematically distinguish what was configurationally constant to the type, from what could configurationally vary between individuals.

Again, although quite satisfactory for the *Landhäuser*, this argument only suggested a direction in which further empirical studies of genotype might proceed – it did not actually demonstrate that such hierarchical conceptions should underlie all typological cases. Mies’s working design sketches further strengthened the hierarchical conception of genotypes, by showing that the clusters were not merely theoretical entities, but had tangible presence as provisional design elements (acting as provisional place holders for finer scale configurations that were not settled). Again, however, such examples are illustrative rather than demonstrative, and clearly the idea needs much further exploration; it should also be mentioned that other studies have proposed similar configurational descriptions, quite independently of this work (compare with, for instance, the idea of ‘sectors’ in Amorim, 1997).
3. Rethinking Genotypes

Despite their differences, what is common to all these studies is the idea that the genotype refers to those aspects of the spatial organisation that express its core sociological functioning. But why call the socially relevant typological element of buildings a ‘genotype’? The term was first introduced into space syntax literature in a very early paper by Hillier and Adrian Leaman (Hillier and Leaman, 1974). And there, it was introduced to make another critical distinction - the difference between what was actually built and the general rules that determine how a building is to be built. The classic example that was invoked to illustrate the idea was that of a Roman army encampment:

‘Consider an example. An army marches all day. At nightfall a halt is called and unpacking begins. Within a short time a structured environment appears. ... A complete environment is, as it were, “unfolded”. The army experiences this as a simple, repetitive procedure. But looked at scientifically in terms of the structures which must exist for such a simple “unfolding” to be possible, it is both complex and illuminating. First, the observable environment which is unfolded is based on a set of instructions in the army manual or in standing orders. Second, these abstract instructions and relations are “embedded” in the items the army carries about with it to manufacture this environment, which may be called its “instrumental set”. Third, and most important, it will be noted that any series of camps unfolded by the army will exhibit both similarities and difference. In this simplified and artificially deterministic example, the source of similarity is the set of instructions as embedded in the instrumental set, and the source of differences is the local constraints and contingency, which will include personal and environmental factors, strategic considerations and so on.’
(Hillier and Leaman, 1974, p.4)

And following this,

‘Although an extreme example, this structure does illuminate certain pervasive properties of cultural forms. In many situations, sets of basic instructions which are variably unfolded are not written down or genetically programmed, but embedded in the artificial systems which we call “cultures”. Deep cultural structures may be transmitted unchanged through several generations, yet produce great variety at the observable level. Such underlying stable structure corresponds to what biologists call “genotypes”, compared to a “phenotype” which is a variably developed observable form. In the army example, the genotype is the information carried in the instructions and embedded in the instrumental set; the phenotype is the observed layout and activity of the camp.’
(Hillier and Leaman, 1974, p.4-5)

Hillier and Leaman, aware of the limitations of the biological analogy, went on to advocate the use of the terms g-model and p-model to replace genotype and phenotype (developed further in Hillier and Hanson, 1984, p.198-222). The main problem with the analogy, they felt, lay in the nature of design process - ‘the cultural genotypes [the structured sets of instructions] evolve much faster than biological genotypes and may be able to alter themselves by self-reference’ (Hillier and Leaman, 1974, p.5).

However, there is another deeper problem with the analogy. The genotype/phenotype distinction, as well as the g-model / p-model distinction, was taken to be a type/token distinction, the term ‘token’ being used to represent the concrete instantiation of the otherwise abstract type. The ‘phenotype, which is a variably developed observable form’ (see quote above) is thus interpreted as a token. But as the biologist Richard Lewontin cautions us, the difference between genotype and phenotype is a difference between two types (Lewontin, 2011). The phenotype, as much as a genotype, is a type. Both terms refer to sets of characteristics or traits that define, not an individual, but a class or species.

‘The genotype of an organism is the class to which that organism belongs as determined by the description of the actual physical material made up of DNA that was passed to the organism by its parents at the organism’s conception....
The phenotype of an organism is the class to which that organism belongs as determined by the description of the physical and behavioral characteristics of the organism, for example its size and shape, its metabolic activities and its pattern of movement.

(Lewontin, 2011, original emphasis)

The type-token distinction, in contrast, is recognized by referring to the two aspects of the physical organism itself, as the ‘genome’ and the ‘phenome’. Here is Lewontin, again, continuing his description:

‘It is essential to distinguish the descriptors of the organism, its genotype and phenotype, from the material objects that are being described. The genotype is the descriptor of the genome which is the set of physical DNA molecules inherited from the organism’s parents. The phenotype is the descriptor of the phenome, the manifest physical properties of the organism, its physiology, morphology and behavior.’

(Lewontin, 2011, original emphasis)

Now, at one level, to point this out is to indulge in a bit of academic pedantry; the terms persist in space syntax theory not so much on the strength of their biological origin, but because they serve an analytical purpose within the theoretical discourse, and by now have come to acquire quite stable and unambiguous meanings in space syntax literature irrespective of their correspondence with the original biological terms. But, correct terminology aside, the recognition of the difference does have some practical values. When the terms were first introduced in biology by the Danish botanist Wilhelm Johanssen in 1908, their use was to acknowledge that the observed characteristics of an organism came from two entirely different causal pathways – one through hereditary transmission, and the other by natural development in the course of life of the organism. Without stretching the biological analogy past the point of snapping, could such a distinction be of use to architecture as well?

One could easily make the case that it would not. Already in 1979, as the main ideas behind space syntax were being formulated, Philip Steadman had made the telling observation that technological evolution would be better described as being Lamarckian, rather than Darwinian, in character – changes in designs of objects are often made due to lack of environmental fit, and if they work, such changes persist through succeeding generations, because they are literally copied by succeeding craftsmen, designers, or builders (Steadman, 1979, p.124-34); there are, in other words, no separate causal developmental and genetic pathways in the shaping of artifacts. But, this point, however valid, is not the entire story, for the point to take away from biology is not that there may exist architectural analogues of genotypes and phenotypes, or analogues of developmental and hereditary pathways, but rather the general principle that characteristics and traits observed in an individual may result from generative processes that follow causally different pathways.

To understand why such a principle would be useful, recall that the operational procedure to describe the genotype in a sample of buildings has been to collect together a set of observed traits that are consistently present within all, or most of the buildings in the sample – the rank ordering of functions according to integration values being the result of such consistency within the access graphs that are constructed to capture the discrete relational structure of the buildings’ spatial configuration. But it is entirely possible that the observed consistency (or, for that matter, the lack of an observed consistency, when expected) may be the result of the spatial configuration being structured as a result of more than one causal process; some aspects of the spatial configuration of buildings (and so of the access graphs derived from it) may arise from requirements of social function, but possibly some other aspects of the graph structure might arise from an entirely different kind of source. If this is true, then
it points to the usefulness of introducing some kind of a description of design process into our understanding of the shaping of buildings. Interestingly, even the brief history of the genotype concept that I have sketched so far suggests that this is not entirely a new line of thinking within space syntax.

4. Varieties of formal types
Consider the interesting shift that happened in the invocation of genotypes between 1974 and 1987. In the 1987 paper, Hillier, Hanson and Graham define genotype in terms of ‘relational and configurational consistencies’ (p.379) of the spatial configuration of individual buildings, through which ‘social relations and processes express themselves in space’ (p.362); Hillier (1996) repeats this formulation, and this is much the sense in which subsequent papers on space syntax have used it. The point to note is that the terms in which the genotype is described – as the distribution of integration values of functional spaces (their rank order, their difference factor values, the identification of the most integrating function, and so on) – are essentially terms of functional specification. The genotype is essentially the description of structural relations amongst the discrete programmatic spaces that are to hold if the building is to fulfill its social function correctly. Compare this definition to the one advanced in the 1974 paper. There, Hillier and Leaman identify the genotype as an informational entity quite distinct from the building itself. In the army camp, the genotype consists of ‘the information carried in instruction manuals and embedded in the instrumental set’. Even when they generalise the notion to cover the set of buildings at large, which naturally do not come with specific design or construction manuals or with a physically embodied instrumental set of the encampment, they still speak of genotypes as being constituted in ‘sets of basic instructions’, and ‘deep cultural structures’. The original definition of the genotype was, therefore, not in terms of a functional specification, or of relational features exhibited by actual buildings, but rather as the description of a generative or production mechanism. And this shift in the understanding of the genotype was not incidental. As the very title of the 1987 paper (‘Ideas are in things’) indicates, the theoretical notion advanced to support the shift was that since genotypical ideas were transmitted through the retrieval of social knowledge embodied in buildings, it would not be necessary to describe the actual design and building procedures – the finding of functionally relevant consistency in graphs would naturally give the definition, whatever the actual processes by which the graphs were brought about.

What I am arguing for, in this context, is to revisit the original definition of genotypes as generative mechanisms. This does not mean discarding the idea of the inequality genotype, but rather to recognise other valid descriptions of type depending upon the causal processes that may generate them. The integration-rank-ordering of the inequality genotype is a signature of what we may call a sociotype of buildings – that is a class of common relational structures that enable the specific general social function which the building must satisfy. But, in addition to this, other aspects of the spatial configuration (and so features of the access graphs describing them) may also result from what we may call a stylotype – a class of specific formal traits that result from the demands of what at least provisionally we may define as design-governed, or stylistic, criteria. The term ‘stylistic criteria’ is general and admittedly somewhat loose. But rather than specify it more precisely from the outset, I will try to give a sense of it by describing its role in creating typological structures. To do this, I return back to the Hanson paper on architects’ houses in London. The Hanson findings, as I pointed out earlier, are particularly insightful in illustrating broader points about type; the following discussion should make clear what I meant. It will be recalled that Hanson
reported architects’ houses to be significantly larger in area as compared to speculative houses, and that the difference in size was accounted for in a large part by the increased investment in transitional spaces. In purely descriptive terms, the architects’ houses featured many more elongated convex spaces, which were for the most part dedicated to circulation and or ancillary activities, rather than the main domestic functions. The question to ask of this finding, as Hanson does, is whether this is a matter of sociological import – does this difference imply that architects’ houses belong to a fundamentally different sub-culture, with a distinctive set of values different from those of the overarching culture, within the overall domestic culture expressed in the late twentieth century London single family house? Her answer is that while the architects’ houses clearly share the overall values with the larger culture to which they belong – a culture that finds its expression in increased mutual privacy and respect for the individual within the house – the increased investment in transitional spaces allows them to bring a greater degree of flexibility and more articulation to the expression of these values. Largely because of the presence and disposition of the transitional spaces, the individual in the architects’ houses has a greater control and choice in fine-tuning his or her relative privacy.

All this is both reasonable and telling, but it also raises the question of how such layouts are brought about. For however typological this transitional-space-oriented house may be, the means by which such a configuration is to be achieved cannot easily be pre-specified. Circulation spaces, as most architects will know, are, for the most part, treated as non-programmed spaces. That is, they are not usually specified distinctly in programmatic briefs that architects are given. Clients concerned with economy and efficiency will often expect such spaces to be minimised, which explains their scarcity in the builders’ houses; but even architects’ who are designing their own houses, and may be more tolerant of them, are not likely to specify or list them explicitly. Given this, the finding that there are more functional spaces cannot directly lead to the inference that more spaces as such were desired; it is quite possible that such spaces are Gouldian spandrels, their presence being an inadvertent result of other considerations in the design process. To say this is not to deny that, in the architects’ houses of Hanson’s sample, there was some functional specification of elaborated buffer zones between rooms, or of increased flexibility in altering the internal privacy of rooms. It is rather to say that the existence of such a functional specification, could not by itself account for the presence of increased transitional spaces. Such functional requirements could be satisfied by other kinds of spatial organisation, as Mies demonstrated in his courtyard houses of the early 1930s. So, descriptions of functional specifications are not adequate by themselves as explanations of observed characteristics of spatial configurations. What one needs to make the explanation work is a more explicit account of how the observed regularities in the spatial organisation of these houses resulted from the conditions within which the houses were designed.

Such an account is not yet available – indeed, part of my intention in this paper is to make a case for a program of research to develop such an account – but from the little that we know of design processes, it may be argued that observed regularities of the spatial organisation may arise either from general functional requirements, or as by-products of particular ways of working that may include deliberately adopted stylistic approaches, aesthetic judgments, consciously adopted design-strategies and design conceits, or of unconscious habits of problem-solving that invariably accompany the work of trained designers (for some studies that offer evidentiary support on this point, see Keller and Keller, 1996; Glassie, 1975). However, even in the
absence of systematic procedures and actual design protocols from houses in the Hanson sample, we can still offer reasonable speculative accounts for the sake of presenting an illustrative argument. Comparing the actual plans of the houses with the partitioned diagrams, and hypothesising a conventional design process, one can begin to get a sense of how the extra, unplanned transitional spaces might have come about. The most common way for such spaces to appear in a design is when it is necessary to connect several rooms at an equal depth from another room, or from the rest of house; these are the typical lobbies and short corridors that connect, for instance, a living room, or staircase to the two or three bedrooms (for instance, in the first floor of houses 1 and 2). However, such conditions arise once or perhaps twice in a single house of the kind being considered here, so transition spaces created deliberately for graph theoretical reasons are not likely to proliferate within a building. The houses in the builders’ sample would be very likely to contain such spaces as well. But where the architects’ sample differs, I think, is in the transitions created by other typical moves. One such move, which can be discerned easily from the actual plans, is of inserting ‘islands’ within a larger area. In house 16, which has the lowest use/transition ratio of 0.39, the single design move of inserting a large cut-out on two floors, in order to create a void, creates at least seven relatively narrow convex passages around it. The fragmentation of space around the open stairwell in both the ground and first floors of house 3, also in order to create a void, gives another example of such a condition. Another type of move that results in fragmented space and multiple transitional spaces is through misalignment of the interior partitions; instances of this misalignment are easily discerned in houses 1 and 7, although it can be found to some extent in almost all the houses. The misalignment is, by itself, not a desirable or sought after condition; but it does not seem unreasonable to infer a few typical design considerations that give rise to it. For instance, it is created often by the exercise of fitting oddly, and variously sized rooms within a larger regular block (the fitting of living, dining, kitchen, and an assortment of cabinets in the main block of house 1), in which the programmatically open circulation spaces absorb the left-over, and therefore, oddly shaped areas. In other cases, (very likely, in the joint of entrance and bedroom corridors in house 7, for instance) it is created explicitly by the kind of requirement that Hanson describes – assuring visual privacy by breaking a direct line of sight.

In all these house plans, then, the actual spatial configuration emerges partly in response to direct functional requirements, but partly also as the unintended result of specific tactical design moves. The presence of the relatively large number of transitional spaces is quite likely a product of the latter, rather than the former (although this does not preclude their social functioning along the lines indicated by Hanson in the closing arguments of her paper). If this is true, then we can draw some interesting conclusions about the emergence of types in architecture, for the point to note is that despite the considerable variations in the design approaches of the architects of these houses, taken as a whole they do produce some kind of consistency in spatial configuration. The investment in transition spaces, organised in rings, which produces ‘the spatial signature that identifies these houses as a group’ (Hanson, 1998, p.240), but is not quite a genotype, can be taken to be fairly good indicator of a stylotype.

Although this spatial signature is an indicator of a stylotype, it is not a full descriptor of it; the discussion above shows – I hope at least provocatively, if not persuasively – that we need a systematic theory of description of the stylotype. But short of that, we can still make a few points about the nature of the stylotype.
The first point is to recognise that designers tend to work in a Euclidean space – inserting an island within a larger space is a move that requires careful calibration of dimensions and perception of scale, and so does the deliberate misalignment of walls in plan. The Euclidean geometry in such cases acts as a constraint on the emergent discrete topology of the spatial configuration. This observation reverses the conventional idea that the discrete topological structure of a building is the more general and so governing element in the design of a building in comparison with the geometry of the building, and prepares us to see that descriptions of type may lie as much in the geometrical description of buildings.

A second point is to note again is that the sources of stylotype are varied, but very likely to be based in human cognitive capacity. As cognitive studies of designers-in-action have shown, those, like architects, who are trained to address problems with incompletely specified solutions, develop consistent procedural strategies to deal with such problems. These strategies include low-level protocols to do basic routine tasks, as well as high level ‘umbrella plans’ that organise a given problem into sub-problems defined in terms of the low-level protocols (Keller and Keller, 1996; but also pre-figured in Glassie, 1975). Such procedural protocols and umbrella plans are not just mental entities, but include a mix of operations partially embedded in physical tools and supported by an empirical knowledge base. And although such protocols might include some personal element – individual aesthetic preferences or preferred strategies – overall designers from a particular milieu are likely to share many of these procedural protocols, hence making the emergence of style-oriented type in their designs quite unsurprising.

Taken together, both these points imply that the stylotype is, in terms of design logic, prior to the sociotype; the specification of the sociotype seems far more permissive than that of the stylotype, and it also seems likely that the social knowledge embedded in buildings that is reproduced in the sociotype is located within the procedural strategies and umbrella plans that generate the designs. It could be suggested that in the practice of designing and executing buildings it is the stylotype which is generative; rules governing it are constitutive, as compared to the sociotype, the rules governing which are regulative.

If all this is to be accepted, what does it tell us regarding the question that Hanson postulates in her paper – do architects’ houses constitute a separate sub-culture defined by the distinctiveness of the spatial structure of their own houses? Her answer that these houses are distinguished from the speculative houses not by exhibiting entirely different relational structures, but by offering far greater and more subtle opportunities of spatial reconfiguration and fine-tuning of privacy gradients, is characteristically nuanced and simultaneously sharp. What I have hoped to do in my paper is to build on this insight by suggesting that the presence of such spatial opportunities (or their relative lack in the speculative houses) can also be described as a matter of type, if one could describe type in terms of features resulting from specific design approaches. One of the key issues that Hanson has identified for space syntax research, and to which she has made foundational contributions, has been the extension of syntactical theory to account for the shaping of buildings by concept-driven, critically-oriented architectural practices. In the paper on architects’ London houses, but also in papers on Gerrit Rietveld’s Schröder house and in her comparative study of contemporary architects’ houses, Hanson has repeatedly shown that the houses feature systemic spatial properties whose function is to fine tune and enrich their inhabitants’ lived experience (Hanson, 1998, p.196-214 and p.242-68). My hope is that further work on stylistic or design conception of type will show that such functions are not just an
experiential bonus, but rather essential to the role buildings play in our lives – that just as the sociotype caters to the generic social function of buildings, the stylotype may be shown to cater to their generic imaginative function (Bafna, 2012).

References


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