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Abstract

The “skin” of a building - its facade - is sometimes considered to have a social and cultural role in representing what is inside the building. In this framework the social/cultural function of skin - the surface of a space - is primarily one of defining a relationship of the spatial unit (e.g. house, person, car) to the larger society. However, it is suggested here that the limiting of the surface to its representational function clouds and obscures spatial relationships and often functions to create and maintain spatial separations that are negative.

The purpose of this paper is to move “skin” out of the world of representation where it “stands for” something else and into the world of connection where it has a spatial function in so far as it is a connection of those parts of the space of building that are, simply put, inside and outside. Connection is defined as something tangible, physical and integral to space.

The premise underlying this point of view is that the outside of a building is as much a part of the building as the inside. This premise is underscored by work done with Jaimen McMillan and the Spacial Dynamics Institute that is about the dynamics of movement in and around the human body. In this work, a person is never just the physical body. A person is comprised of a body that occupies space and the space around the body.

Similarly, architecture is comprised of the building and the space around the building. From a framework of experience with Spacial Dynamics, we can begin to see the “skin” of a person or of a building as the connection of spaces - inside and outside - that is both logical in the sense of being deeply understandable and knowable and physical in the sense of it being something experienced and moved through. It is argued here that this moving through, in, and with space - is a more critical, fundamental and underlying aspect of space, as compared to the representation of space. The articulation of the skin of a building, or of a person, is about the movement between inside and outside. Through consideration of this and other aspects of the dynamics of space, it will be suggested that movement is constitutive of space rather than being a product of space.

Building Skin as a Connector - Not a Representation

“Around the living being, or rather through it and by means of the filtering action of its surface, there is affected a continual circulation from the outside to the inside, and from the inside to the outside, constantly maintained and yet fixed within certain limits.” [Foucault 1994, 273]

Beginning

The exterior appearance is what we first see of a building. In a similar way, we see people first as how they visually appear to us. In both of these cases it can be said that we are seeing the “skin” of the object. “Skin” is the boundary of the object that separates the object from the space around it.

The “skin” of a building – its facade – is sometimes considered to have a social and cultural role in representing what is inside the building. Traditional typologies of buildings such as “church,” “house,” or “town hall” usually have sufficient connection to a system of understanding that we know the use of the building from the architectural elements that are combined to make the exterior form. In the impoverishment of the world that encroaches on us, we need the literalness of a sign to know the function of other types of buildings: Wal Mart, and all the rest.

The purpose of this paper is to move “skin” out of the world of representation where it “stands for” something else and into the world of connection where it has a spatial function as a connection of those parts of the space of building that are, simply put, inside and outside. Connection is defined as something tangible, physical and integral to space.

It will be suggested that the limiting of the surface to its representational function clouds and obscures spatial relationships and often functions to create and maintain spatial separations. Building surfaces can function within a symbolic social system that denies the space and makes the symbolic aspect of the surface into the predominate social function.

However, the social and spatial function of the surface of a building is the subject of this paper.

In this framework, the social/cultural function of the surface of a space (the “skin” as it is referred to in this paper) is primarily one of defining a relationship of the spatial unit to the larger spatial society. This paper concerns itself with buildings, but reference will be also made to the function of the “skins” of other spatial objects, especially people.

A key premise underlying this point of view is that the outside of a building is as much a part of the building as the inside. This premise derives in large part from work done by this author in a movement training workshop with Jaimen McMillan at the Spacial Dynamics Institute [McMillan 2004-2009]. This training is in the dynamics of movement in, around, and through the human body. In Spacial Dynamics, a person is never just the physical body; rather, a person is comprised of a body that is a space and the space around the body.

Similarly, architecture is comprised of the building and the space around the building. From the framework of experience with Spacial Dynamics, the “skin” of a person, or of a building, is a connector of spaces - inside and outside - that is both logical in the sense of being deeply understandable and knowable, and physical in the sense of it being something experienced, and in the case of buildings, clearly moved through.

It is argued here that this moving through, in, and with space is a critical and fundamental aspect of space. It is substantively different from the representation of space. The articulation of the skin of a building, or of a person, is about the movement between inside and outside. Through consideration of this and other aspects of the dynamics of space, it will be suggested that movement is constitutive of space rather than being a product of space. Deleuze and Guattari say it well:

“A substance is said to be formed when a flow enters into a relationship with another form.” (1983, 240)

Some Context – Architecture and Language

A view of buildings as symbolic systems has roots in the field of semiology inquires made popular in the mid 1970's with the interest in semiotics, language, and meaning in architecture. Charles Jencks was one of the promoters of this outlook (1977, 1980). Work by Roland Barthes of course both popularized semiology and was a paradigmatic foundation for the work of Jencks and others (1967,1968). The problem of the relationship between language and architecture was more productively addressed, for example, by Bill Hillier, et al. (1984). Their theory of “morphic language” was developed in a similar time frame yet is distinctly different from an analysis of semiology and architecture in so far as there is a central tenet of “spatiality”

That there is “spatiality” is a premise that is central to the discussion of this paper. The discussion to be presented is that, from a perspective of space and movement, the surface of a building does not represent anything but is itself a spatial component of a spatial system.

Saussurian linguistics (De Saussure 1977) was the precursor to the work done by Barthes, Jencks, and others. While this paper will in no way attempt to offer any detailed discussion of linguistic theory and its ongoing paradigmatic influence, work by Deleuze and Guattari does link to a linguistic paradigm and informs this paper. As they say:

“...Hjelmslev's linguistics stand in profound opposition to the Saussurian and post-Saussurian undertaking [semiology]...because within this field it sets in motion its flows of form, substance, content, and expression...he tends to fashion a purely immanent theory of language.” [1983]

An “immanent theory of language” is understood here to mean a language that does not rely on something other than itself for its intelligibility. “Immanent properties inhere in things, and are there all along, though it might take special circumstances to make them apparent. Transcendent properties come from outside...” [Ballantyne 2007, 29] This is a spatialization of language.

Elizabeth Grosz, a feminist theorist, describes Deleuze and Guattari's theory:

“.....a Deleuzian framework refuses to duplicate the world, to create a world and its reflection, whether that reflection appears on the psychical interior in the form of ideas, wishes, and hopes or on the social and signifying exterior as meanings, latencies, representations.” [1994, 180]

This action of “refusing representation” is central to the argument to be presented here. Guy Debord has written on the roles of systems of representation in *Society of the Spectacle* (1973). What is suggested by Debord is that the seemingly useful role of the “skin” in organizing us in relation to each other has a functional role in connecting society in a non-spatial way. Debord's view helps us see that the deeper and more underlying relationship of the skin/facade aspect of a building is to make separation, as compared to making connections, by turning space into a represented system within a world of commodity representation.

It can be noted that this model of society has its roots in Emile Durkheim (1893) and his concepts of organic and mechanical solidarity. Similarly, Basil Bernstein in *Class, Codes, and Control* (1971) articulated his theories of social codes having a function in preserving and reproducing the class structure of a society. This functionality of the “representation” of surfaces – facades of buildings, fashion, or style of cars - when they are said to have a negative impact on people, has to do with their role in creating separation.

Some Context: Architecture and Buildings

In the practice of architecture, Herzog and de Meuron have designed, with artistic energy, a number of buildings where the surface of the building, its “skin”, is not of familiar or traditional architectural forms. These projects include the Dominus Winery in Napa Valley California where the “skin” is made of “gabions” - those chicken wire enclosed blocks of stone used in highway retaining walls - and the “Bird's Nest” stadium for the Beijing Olympics where the skin is actually the structure, and yet is also simultaneously a metaphoric allusion to culinary bird's nest soup.

This work is interesting because the surface is the structure. Similarly, the Seattle Public Library by Rem Koolhaas also makes the skin a highly conscious element while at the same time it is the structure for the building. The reality of the Seattle Public Library is that the skin has an integrity of being the structure and is the central idea of the building, the “parti” as architects would say.

The idea of the skin being the structure is epitomized by the Seagram Building in New York City by Mies van der Roë. The joke of this building is of course that the elaborate detail of the surface “I-beams” are in fact not columns at all, they only represent the columns. The notion of form following function that Van der Roë promoted is actually false. Perhaps it should have been said that form represents function.

Surface Architecture [Leatherbarrow and Mostafavi 2002] considers architectural surfaces in their relations to structure and in the way architectural surface creates "spatial effects" that have function in architectural communication.

Dallas, Texas, a city that this author had the opportunity to visit multiple times between 2002-2005, exemplifies an impoverished approach to the skin of buildings. The phenomena of the reflective glass skyscraper, while in no way limited to Dallas, is a true embodiment of the self-reflective, self-obsessed nature of western capitalist society. These skins of glass are the ultimate in boundary making – we can know nothing of the differentiation of what is inside, and they reflect us – literally – or some occasional and pleasant reflection of the sky and clouds. At the same time, they are the absolute worst arbitrator of energy.

Dallas is the sort of place where all equivalences seem to merge and re-appear as multiple forms of apparent difference.

The work of Simos Yannas at the Architectural Association in London has looked at the "skins" of buildings. The focus in this case is "the skin as a generator of built form and 'passive' climatic modulator as 'active' collector, store, distributor, or dissipater of energy." [2004, 2005] There is an analogy in this work with the view presented in this paper: The skin of the building has a real relation – a connection – to the space around the building. In the case of Yannas' work, he is concerned with what will be called here the "tectonics of energy." What is satisfying in his approach is that the surfaces created and experimented with have not only a technological function but also are, as he says, a "generator of built form."

A more prosaic aspect of where the "skin" of buildings acts only as a representation is given by the common reality of the suburban milieu in the United States. "Tudor", "colonial," "southwest" are all styles that are attached to the world of single-family house production in a manner that is, shall we say, only "skin deep." The social function of the skin is to communicate to the neighbors and to the owner a status and to mediate a relationship to society through the choice of "skin" is put onto the house.

"Identity is a dream that is pathetically absurd. You dream of being yourself when you have nothing better to do. You dream of yourself and gaining recognition when you have lost all singularity. Today we no longer fight for sovereignty or for glory, but for identity. Sovereignty was a master; identity is merely a reference. Sovereignty was adventurous; identity is linked to security [and also to the systems of verifications which identify you]." [Baudillard 2001, 52]

This notion of "skin" functions similarly in the social/cultural function of clothes or of automobile design. While all three – houses, clothes, or cars - have utilitarian and functional components - to keep the rain out, keep us warm, or move us around - the social/cultural function is one that primarily defines a relationship between the spatial unit (house, person, car) to the larger society.

Space and Movement

The purpose of this paper is to move "skin" out of the world of representation – where it only "stands for" something else and into the world of connection where it has a spatial function of connecting those parts of the space of building that are, simply put, inside and outside.

Deleuze and Guattari sum up this shift away from signifying systems:

"To the point that if human beings have a destiny, it is rather to escape the face, to dismantle the face and facializations, to become imperceptible, to become clandestine, not by returning to animality, nor even by returning to the head, but by quite spiritual and special becomings-animal, by strange true becomings that get past the wall and get out of the black holes, that make faciality traits themselves finally elude the organization of the face – freckles dashing toward the horizon, hair carried off by the wind, eyes you traverse instead of seeing yourself in or gazing into in those glum faced-to-face encounters between signifying subjectivities." [Deleuze and Guattari 1987, 171]

As compared to “appearance,” a “connection” is something integral and necessary. A “connection” is something tangible, something you can touch. Something that does something. This “doing of something” is not function in the traditional architectural sense of the word. Rather, a connection that “does something” is understood as the inseparability of the parts of a system. This relation of inseparability is called a “machine” by Deleuze and Guattari. Ballantyne, in *Deleuze and Guattari for Architects*, describes this concept of “machine”: Part of the orchid has evolved so closely to resemble the female of the wasp species, and when the male wasp tries to mate with it he picks up pollen which he transplants to the next wasp-orchid that seduces him...that the two have developed inseparably – the example is intensified because the plant's adaptation of its form makes the interdependence very apparent. The wasp is evidently and obviously part of the plant, so where should we draw the frame around its 'identity'? Deleuze and Guattari would resist drawing the line. The two connect and are part of the process of production (reproduction) of the machine. [2007, 24]

This sense of the “machine” is also in Hillier's work, especially in his book *Space is the Machine*. [Hillier 1996]

A second key premise underlying this paper is that the outside of a building is as much a part of the building as the inside. As architects, we most often are focused on the physical aspect of what we design – the material, the structure, etc. We spend a lot of time drawing those pieces of the building that are built and yet architecture is really what emerges around, within, and between what is built – the space.

An awareness of space and the inside and outside aspects of space is also present in the work of Jaimen McMillan and the Spacial Dynamics Institute [McMillan 2004-2009]. This work, on the face of it, might seem to have little to do with buildings. The work at the Spacial Dynamics Institute (SDI) comprises movement training and education. It is about the dynamics of movement in, around, and through the human body. In this work, a person is never just the physical body. A person is comprised of a body that occupies space and the space around the body.

Analogies and comparisons of the SDI with Hillier's work in *Space Syntax* are readily present. There are fundamental logical properties of the system e.g. inside and outside – that are known and understood. The work in the movement workshops that are part of the Spacial Dynamics training program is about the issues of spatial relation between the inside and outside aspects of the “human space” and the spatial relations between bodies (people). For example, at SDI the significance of the space that is “inbetween” two or more people is considered in its role of generating and making relations of larger consciousness. Human language, as Hillier has discussed, is something that is neither inside a person (subject) nor wholly outside a person (object) but rather inbetween.

In the SDI workshops, there is for example, a clapping game that involves a group of about 30 people in a large space. The instructions of the game are first to form a large circle, and then for each person to close his or her eyes and listen for the person on the left who claps, and upon hearing the clap on the left the person moves his or her hands from left to right while clapping. One person has to initiate the first clap. In doing this, the group, with this minimum set of instructions and a minimum global form, generates a higher order structure – that of the sound moving around the space in the large circle that is coincident with the circle of people. The “sound moving in a circle” is an emergent structure that arises from these “syntactic” rules.

Both *Space Syntax* and Spacial Dynamics share the insistence on talking and describing space without reference to other, perhaps metaphorical methods, of describing space. Space is not “like” something else. Space is space.

It must be made clear though that this sense of a “space outside the body,” being also part of the person, is in no way analogous to ideas of “personal space” such as is described by Edward Hall [Hall 1990]. That work relied upon a cognitive subject/object model that tried to describe how cultural variations were coded and functioned.

In his Structural Anthropology, Claude Levi-Strauss describes the structure of kinship systems [1963]. The giving away of the woman to a man in another clan is movement across boundaries. The person given away really moves (literally, to a new place to live) and the system of kinship is spatial because the bodies move across boundaries, thus articulating boundaries by the movement. And there is not really space of this system except when the bodies do actually move.

Something similar can be said of when people die – the body clearly moves away – leaves the space – because it is cremated or buried and simply not there. The memory of that person remains, just not in a body. In the SDI workshops, this was experienced through an exercise called the “death game.” In this exercise people move syntactically in and through a grid of chairs set out on the floor like a street pattern. A figure of death moves amongst the participants and progressively “tags” the people in a manner limited and constrained by movement rules. Each person “tagged” then has to leave the space and has “died.” The movement experience is one of working within a movement rule system and then one of leaving the space.

In the Spatial Dynamics work, another part of the training is juggling. In order to juggle, one has to learn to take the mind out of the process. In fact, if one thinks too much, one cannot juggle. While it is not suggested here that logic is ever removed from spatial considerations, what is suggested is that aspects of space, including their logical characteristics – their form – are fundamentally known through the experience of moving through them. Knowing space by knowing what the surface of the space (i.e. the “skin” of a building) may represent is a secondary aspect of spatial structure and the surfaces of spatial structure.

It is suggested here that knowledge of spatial surfaces as representation only gets in the way of making connections in space. As has been noted, the “spectacle” of society is its reliance on symbolic systems to provide controlled reconnections. The limiting of space to an understanding of it through what its surface represents at the least clouds and obscures the space and at worst functions to create separations that are negative and alienating. DeBord, from *The Society of the Spectacle*:

“The spectacle is nothing more than the common language of separation. What ties the spectators together is no more than an irreversible relation at the very center that maintains their isolation. The spectacle reunites the separate, but reunites is as separate.” [1973, chap.1 sec. 29]

The idea of architecture as the building and the space around the building is derived from the experience and the Spatial Dynamics premise that the space of a person is the body of that person and the space around that body. The “skin” of a person or of a building is the connection of those spaces – inside and outside – that is both logical in the sense of being deeply understandable by the mind and physical in the sense of it being something experienced and moved through.

In the case of a building it is easy to see how one moves through the “skin” because there are openings made in the skin for that very purpose – doors and windows, at the least. In the case of the human body it is perhaps a little harder to conceptualize this, but aspects of the body – mouth, eyes, ears, and other openings – are openings in the skin, i.e. in the surface.

What is common in these two seemingly different systems is that openings are articulated and “decorated.” This is the work of an architect in making buildings – we build frames and cornices around a door, for example. In the case of people, we sometimes decorate the openings with lipstick or earrings. The openings are important so they are articulated. Going further, the edges are also important, so they are articulated. For example, the cornice of the building at a roofline articulates the connection between the building and the sky. And the difference in the way the base of a building is articulated is about the connection between building and ground. Floors are surfaces that connect building space to ground.

This world of articulation is not to represent something that we may know is inside, though it can appear that way and can indeed have that function. What is suggested here is that our goal and

task as architects is to not let the role of those devices predominate or be the only role that this “decoration” plays. (Decoration is of course the pejorative term – except to the profession of interior decorators – “articulated” is the more architectural term.)

The experience of space – the moving through it – the juggling of balls without the mind interceding – is a critical, fundamental and underlying aspect of space. We know the skin of building as a connector when we have experienced moving through that surface and have experienced both parts of the overall spatial ensemble – the physical building and the space around that building, its inside and its outside.

A wall is such a fundamental object. With the making of a wall there are two sides. One side can be experienced and the other side, in the absence of openings, may be unknown. The making of an opening – what architects do – then creates the opportunity to move. And once moved, then a person may know the other side. Moreover, it is only after moving through that opening, that a person can then have the full logical set of “other side” and “inbetween” (the opening itself). Additionally, if the wall creates a boundary that also encloses a space, then there is also an “inside” and “outside” aspect of the logical properties.

When the properties of inside and outside are imagined or, practically speaking, understood as function and use of a building, then the knowledge of the space comes not from the space but from the systems of appearances. The poverty of the built environment, particularly in the United States (or wherever the economic culture of the United States has extended itself) is in the “big box” store where there is no experience other than the surface of the box with the literal “signs” that tell us which brand of box it is.

In his paper “Up, Across, and Along”, Tim Ingold tells us that “The line drawn on the sand is of course the trace of a moment” [2005]. This line in the sand, with two sides to it and all the logical properties pertaining to an object with two sides, is not in this case generated from an idea of what that line should be. Rather it is a product of the movement – an emergent form.

Tim Ingold's paper describes a space of movement:

“Life will not be contained, but rather threads its way through the world along the myriad line of its relations. But if life is not enclosed within a boundary, neither can it be surrounded. What then becomes of our concept of environment? ... For inhabitants ... an environment comprises not the surrounding of a bounded place but a zone in which their several pathways are thoroughly entangled. In this zone of entanglement – this meshwork of interwoven lines – there are no insides or outsides, only openings and ways through”. [2005]

There is work by a German anthropologist, Otto Freidrich Bollnow, (published only in German) that is reviewed by Nold Egenter in a paper presented at the 5th Annual Conference on Semiotics and Space [1992]. There are two things of particular interest here, Bollnow had a concept of the center – akin to the dwelling – and suggested that anthropological space is space that is known from the actions of a society going out from the center and coming back – movement of course.

Secondly, he describes a concept of “hodological space” deriving from the Greek word “hodos” for path that is based on “the factual topological, physical, spatial, and psychological conditions a person is faced with on the line from point A to point B...” [Egenter 1992].

The spatial paradigms of Ingold [2005] and Bollnow [Egenter 1992] root themselves in movement. The “entanglement of the web” described by Ingold and the discussion of the “center” relating to the dwelling and a going out and back in relation to the center can both be contrasted with a common ethnocentric assumption that there is a universal and infinity extensive homogenous and continuous space. For both Ingold and Bollnow, space is made, and then known, as a product of movement.

In a similar vein, Nelson Goodman describes a process of making knowledge in his “Ways of Worldmaking”:

"This book does not run a straight course from beginning to end. It hunts; and in the hunting, it sometimes worries the same raccoons in the same tree, or different raccoons in the same tree, or even what turns out to be no raccoons in any tree. It finds itself balking more than once at the same barrier and taking off on other trails. It drinks often from the same streams, and stumbles over some cruel country. And it counts not what its killed but what is learned of the territory explored." [1978]

The simple act of making a wall and, making an opening in it, and moving through that opening provides a knowledge of space that comes from the movement, not the idea of it. It is a "counting of what is learned of the territory explored" to paraphrase Goodman's words.

For the making of architecture, when we come to know that the surface of a building is a connector, then our effort to design and articulate that connector can be about how to make a better connection. One way that a better connection can be made is with articulation and design of the opening, edges or other parts of the surface that are themselves connectors – the parapet of a building is in-between the volume and the space beyond – the sky.

When we shift this object being made away from the worlds of style, representation, spectacle, fashion – whatever the word – to an object of space – a connector of spaces – then we have moved towards architecture as space and away from architecture as consumption.

Space Syntax presents us with a paradigm of space as fundamentally logical and understood. The premise is that there is a mind that is doing this understanding. From the early understanding and articulation of this paradigm, Space Syntax has evolved its concept of "axial lines" as a measurement of connectivity – a description above all else. As understood here, axiality grew out of this logic of space. Axiality is also a measurement of the possibility of movement. A logical proposition of Space Syntax such as "A contains B" (where A and B are distinct and separate spaces) is about the idea, and reality that you can only get to space B by going through space A. This is a movement relation in addition to being a logical relation. Space syntax sees this movement, or perhaps opportunity for movement, as resulting from the presence of the two spaces and their logical, and understood, relation.

The conjecture offered here in this paper is that if movement is seen as the component of the dynamic that exists before there is articulation of space, then the paradigmatic reality of space may be built out of movement experience.

Geometry gives us delineation and definition of space in much the same way as buildings on the ground do. Yet geometry is first and foremost an abstraction. Spacial Dynamics has exercises - for example, "walking in a horizontal plane" and "walking in a vertical plane," where the movement of the body goes from a center, perhaps a point, to the outside. The limbs are drawn by the outside with the delineation of geometry and our ability to know and reproduce geometry. As we move through these forms (lines, planes, spheres) we discover order, stability, and good sense.

This is not inconsistent with other kinds of moving such as the moving that Ingold [2005] describes as the moving of an arm to make a line. We can have both moments. Likewise, movement from inside to outside can have rhythmical aspects, whether at the personal level of the human body or at the anthropological level described by Bollnow. The movement on a path, or movements on a network of paths, as is described by Ingold, can be called "directional" movement.

Thus we begin to have the seeds for a typology of movement forms that are experientially different from one another yet in no way mutually exclusive.

End thoughts

A problem arises at the end of this discussion of "skin." On the one hand the discussion is about skin and surface. There is a literature and a practice concerned with that. On the other hand, these ideas about "skin," inspired in so many ways by experience at the Spacial Dynamics Institute are not really about surface at all. The surface is a space.

The problem of “skin” is a problem of space. While the study of surfaces can be fascinating by itself, that kind of study, if limited to the analysis of surface, is of limited interest when the energy of the question is about why and how “skin” does something other than represent and signify.

Secondly, any articulation of “skin” is inherently about openings, other sides, insides, and between. There is logic in these qualities and a reality of knowing confirmed by methods of description. The making of walls – of all kinds – and the making of openings in walls delineate and define the surface of the earth and leave “left over” and “inbetween space.”

The linkage between these two aspects of the problem is movement. The theoretical and philosophical evolution that has evolved from, through, around, and beyond Lévi-Strauss, Foucault, and Deleuze and Guattari has this curious aspect of discovering movement and flow. With regard to the shifting away from the analysis of representation, it is suggested that it is necessary to move in order to understand and know. The activity moves from the mind to the body of the person and it becomes the body that then knows. From a perspective of teaching voice in the theater:

“The problem for us is that worlds seem attached to ideas and detached from instinct. Feelings, attached to instinct and experienced physically have to struggle for verbal expression because words seem to belong not in the body but in the head. The mistake has been the banishment of words from the body.” [Linklater 1976, 172]

Movement is a way to get past the limitations of the analysis of representation and thinking. From another resource entirely - Sufi dance meditation practice - comes the admonition that:

“The challenge is to actually have an experience, not the shell of an experience, nor an experience filtered through expectation...” [McPherson 2008, 49].

Further work

The work that can follow from the analysis made here may be likely to include:

1. A more thorough understanding and analysis of “skin” architecture as built in architectural practice and as written about. The approaches taken in such work as “Surface Architecture” is limited to the tectonics of building. A key premise that has been suggested here is that any building is both the space of the building and the space around the building. In that framework the tectonic analysis of “skin” could be expanded to take more consideration of the interactions of the surface with the space.
2. George Liaropoulos-Legendre presents in his book *ijp: the book of surfaces* [2003] both a philosophy about surfaces as well as mathematical treatments for their description and generation. Ongoing consideration of skin architecture would be remiss if it did not take account of and consider this type of thinking.
3. When “skin” is seen as a surface for the collection or distribution of energy – that is as a technical problem (albeit a different kind of technical problem than an approach that is only tectonic and constructional) then the study of the space around that skin, (and inside the skin) will also have a bioclimatic aspect as well as a cultural and social aspect. Further, connection of the bioclimatic to the economic then is another aspect of how the skin relates to society, i.e. economically.
4. The work at Spatial Dynamics includes movement in relation to geometry. There is a whole field of movement study, particularly the work of Rudolf Laban, that is also concerned with geometrical aspects of space and movement that should be considered.
5. Laban Movement Analysis and Notation is of course part in the world of dance and it is impossible to conceive of further work on movement and space without consideration of the practices and theories of dance as an art form and as an indigenous cultural form.
6. There is a work by Lakoff and Johnson, particularly *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought* that likely should be considered, though this would also require attention to the phenomenology of space, the context from which the work of Lakoff and Johnson emanates from.

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