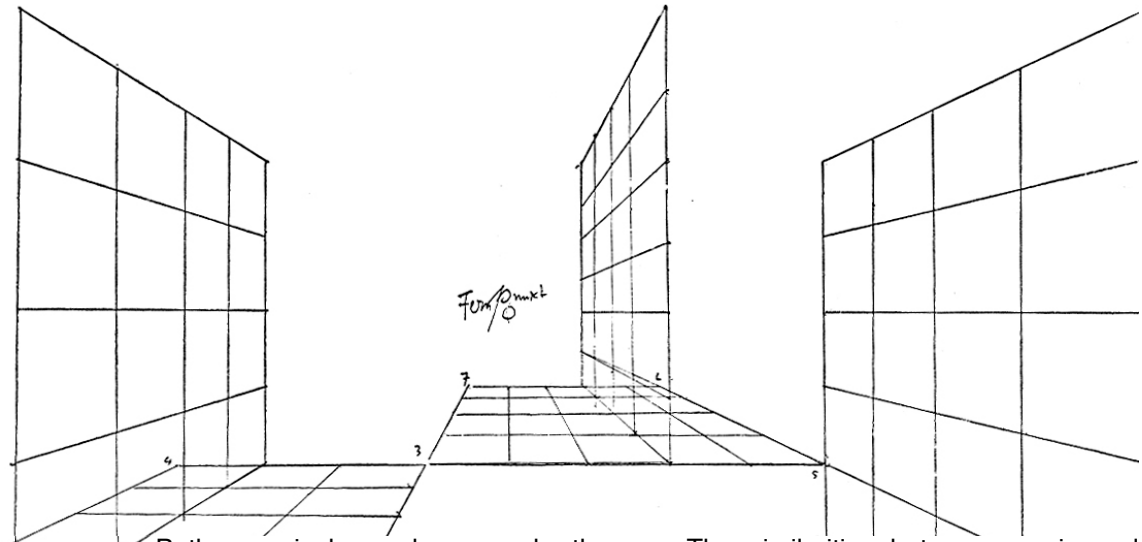


7 background

"[M]usic dominates, reigns actually, harmony; and harmony itself reigns over all things."

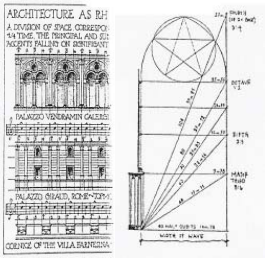
Le Corbusier, 1949

Both musical analogy and the so-called "constructive principle" - the practical translation of music in architecture - have for years been employed by architects and designers to try and incorporate the spirit and organizing principles of natural law into their art. The designers were trying to infuse their work with the air of freedom, the boundlessness that can only be reached when nature and her governing principles are explored by means of music. E. Morris (1996: 66-74) discusses this eloquently.

Music is governed by and stems directly from nature. Like the Greek Orders were a reflection of nature, so music has been in search of ultimate harmonic proportions and it is probably the art form that has gotten the closest to achieving this. For this reason, music is often seen as the teacher of the other arts - music, the most divine and free of arts must become the teacher of the worldly and most materially bound art of architecture!

The similarities between music and architecture, and thus the roots of art, can be traced back to Pythagoras (582-496 B.C.) and his experiments with chords. He realised that certain "pleasing" chords or intervals can be expressed mathematically by simple ratios. He discovered this by letting hammers of different weights sound at the same time and producing harmonic or dissonant sounds depending on certain ratios of weight. The same was also applied to the ratios of lengths of different strings plucked at the same time. He came up with simple ratios of unison (1:1), octave (1:2), fifth (2:3) and fourth (3: 4), which can either be the relation of different weights or string lengths to one another. These intervals are seen as stable and pleasant. The idea of "Harmonic Proportions" was important to Pythagoras and most applicable in terms of his aesthetic idea. He felt that these simple harmonic and strong ratios in music should be transcribed to architecture. He viewed these "Harmonic Proportions" as a

Images from top to bottom: Thanasius Kircher - allegory of the divine principle of harmony, 1650 <> Pythagoras and some of his principles of musical harmony <> musical intervals at Chartres Cathedral as by Loius Charpentier (right) <> architecture as rhythm, Claude Brogdon (left)



"Music, to which architecture responds among the various forms of the plastic arts, is freed from the requirement of portraying actual forms or figures…[It is] separated from matter. Architecture, however…if it is music, then it is frozen music."

Friedrich Schelling, in "Philosophie der Kunst" (1859)

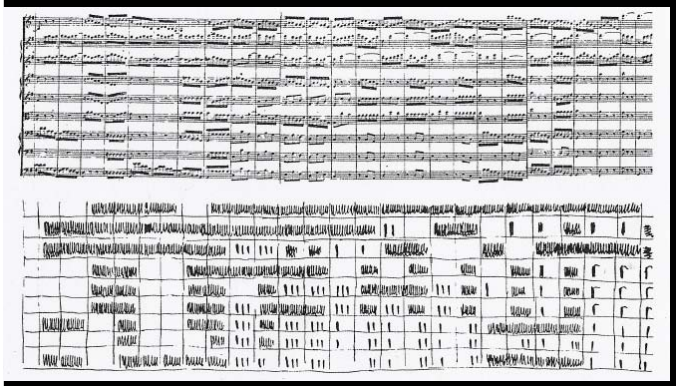
direct translation of nature into music, that these are the proportions that surround us and that they are the ones that immediately feel pleasant. They formed us and we were used to them from the moment that mother earth received us. Vitruvius Pollio (84 – 14 B.C.) was another significant writer on the desire for building to follow the rules of musical theory, with his "Ten Books on Architecture".

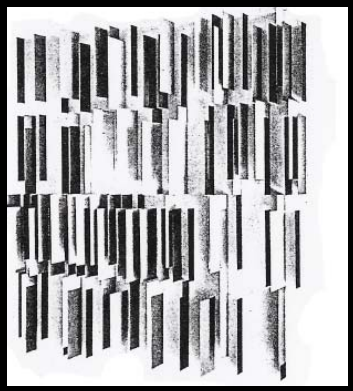
In the ninth century St. Augustine realised that in polyphonic sacred music certain intervals sounded better together than others, and introduced this theory together with the theory of "Harmonic Proportions" into his treatise "De Musica". He also took the Pythagorean idea of harmonic intervals further and ranked intervals in terms of their degree of consonance and mathematical simplicity. He noted that dissonant (or mathematically complex) chords or intervals had the tendency to be resolved in constant ones. "To contemplate geometry in architecture and music is to lead the mind from world of appearances to understanding of divine" (Morris,1996: 67).

These harmonic proportions found wide acceptance in Renaissance builders who worked in simple ratios, as in the work of Andrea Palladio (1508-1580). Analysis of facades has been carried out numerous times to prove these points.

The Enlightenment brought about an even stronger desire to explain almost everything. The context for the application of these harmonic principles was adapted to adhere to scientific methods and thus reduced to a merely quantitative context, stripping it of its beautiful quality and becoming a mere curiosity.

This state of affairs prevailed until the German Romantic philosopher Friedrich Schelling (1775-1854) called for a return of rhythm in architecture, and thus the expression of the ideal of nature in art, in his book "Philosophie





left: Claude Charpentier-rhythmic study of J.S.Bach's "Brandenburg Concerto"

right: Joan Saugrain-graphical translation of a piece from Bela Bartok's "Mikrokosmos"

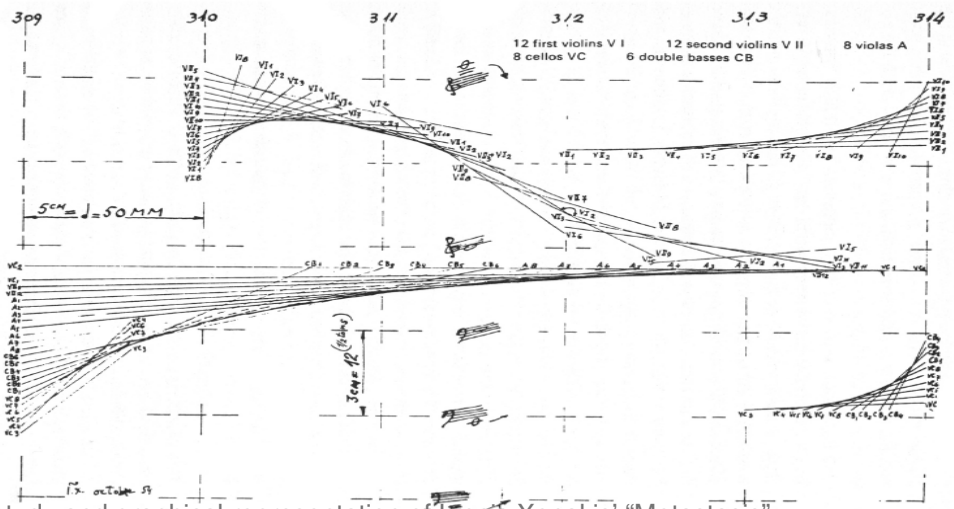
der Kunst" (1851). Schelling was indeed the first person to coin the phrase "frozen music", and not Goethe, as is generally believed. Romanticism portrayed this return to harmonic proportions, to music and thus to the originator in the form of nature. This can be seen in any field of the arts, be it painting, with its vast landscape paintings, or literature, with long and eloquent descriptions of nature. This was the time of a mature Beethoven, of Bruckner, Brahms and Schubert, with music that bleeds nature. It was thus no wonder when Beethoven called his sixth symphony the "Pastoral" and described the celebration of a storm in it. Bruckner's fourth paints nature and was named the "Romantic" by him. Many other examples could further be mentioned.

In the mid twentieth century, the author Claude Brogdon developed this idealisation of nature even further, when he asserted that all matter wants to be an expression of natural law. It can be concluded that the tool to do this with most adequately is music, because it is the source of natural proportions, is not hampered by physical matter and can still express the ideal without inhibitions. Increasingly, artists also felt the need to analyse the graphical qualities of music in their artwork and architecture soon followed suit. In 1952 Claude Charpentier was one of the first to draw abstractions between architecture and music by comparing the elevation to the score and by representing these rhythms in the music as densities of ink on the paper. He differed from the purely analytical mindset and followed a rather romantic view in the sense that he only let the rhythms influence him and did not transcribe them directly into his work.

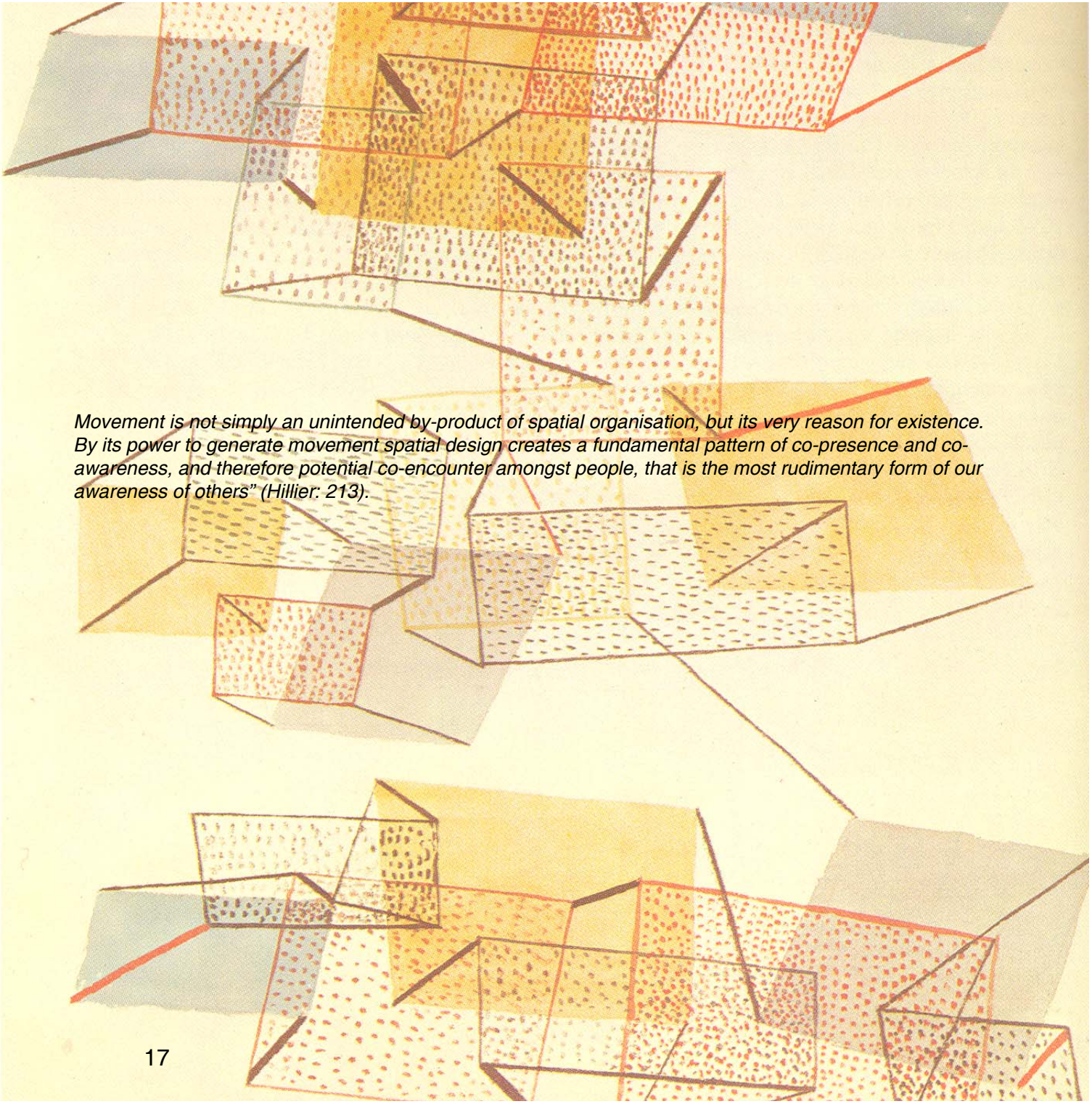
This is where the Modern finally differed with the stern Enlightenment. The Modern Movement in essence is just an extension of the Romantic and, no matter how analytical and scientific it might have looked on the surface, the only striving was that of living in harmony with nature and thus in harmony with the harmonic

proportions dictated by her.
Charpentier was followed by Douglas Haskall in 1960, when he suggested that architecture should take advice from Jazz and introduce off-beat rhythms and dissonant intervals. This came into fruition only later, with the advent of Deconstruction. In the 1940s and 1950s John de Cesare sought to represent music visually in space and developed the "sound unit", where duration was represented architecturally by scale. In 1964 Joan Saugrain went even further and showed the structure and relations of a piece of music by decomposing it. She used coloured planes (pitch = height and colour; duration = planes in base and treble lines; musical harmony = reflecting surfaces of horizontal planes) to analyse a piece by Bela Bartòk.

The first proper collaboration between an architect and a mathematician\ architect\composer was that of Le Corbusier with Iannis Xenakis, finding its climax in the design of the Phillips Pavilion, where they sought to translate the continuity of space in time in a structure. Frank Lloyd Wright must also be mentioned in this context, as he sought to relive the romantic idea of finding the ideal proportions of nature in an almost romantic manner by looking for "rhythms and syncopations" in his work. The twentieth century architect Bruce Goff also saw music as the key to absolute architecture.



study and graphical representation of Iannis Xenakis' "Metastasis"



Movement is not simply an unintended by-product of spatial organisation, but its very reason for existence. By its power to generate movement spatial design creates a fundamental pattern of co-presence and co-awareness, and therefore potential co-encounter amongst people, that is the most rudimentary form of our awareness of others" (Hillier: 213).

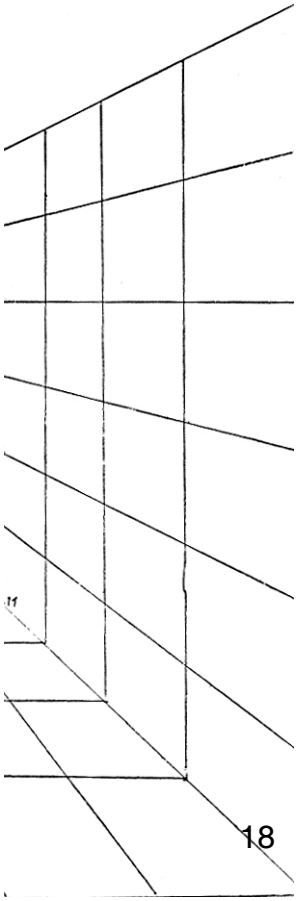
8 movement

The question of what is to be done with the previous section's historical information remains. Is there really a need or place for musical analogy in architecture? Does it serve a purpose other than that in the Enlightenment, where it was used merely as the pinch of salt in the soup of general curiosity in a time of general interest for anything analytical and scientific? In current times, where nearly no trend is left out and anything goes as far as processes in architectural design are concerned, can it still be used as a fundamental tool in the analysis and the making of cities and the architecture within them?

E. Toby Morris introduced the concept of "Constructive Translation", where music is translated in order to include experiential qualities of music into architecture. Very little fundamental research has been done in this field and very few theoreticians have looked at music as a whole, "as an art bound by acoustical perception and consisting of distinctive underlying elements, structures and organizational elements" (Morris, 1996: 70).

An important element to be introduced at this time is the principle of movement. This is one place where architecture and music can meet most effectively. Movement is still the common ground where time in music and space in architecture meet. Music is the expression of sound over time, and architecture, according to Le Corbusier, the "correct and masterly play of masses brought together in light" (le Corbusier, 1927: 29). Together with this, music may occur sequentially and spontaneously, with discrete, yet distinct, beginnings and endings. Parellel to this, architecture can also be seen as a sequence of spaces that get moved through and are perceived with a mixture of senses, which makes the perception much more subtle and difficult.

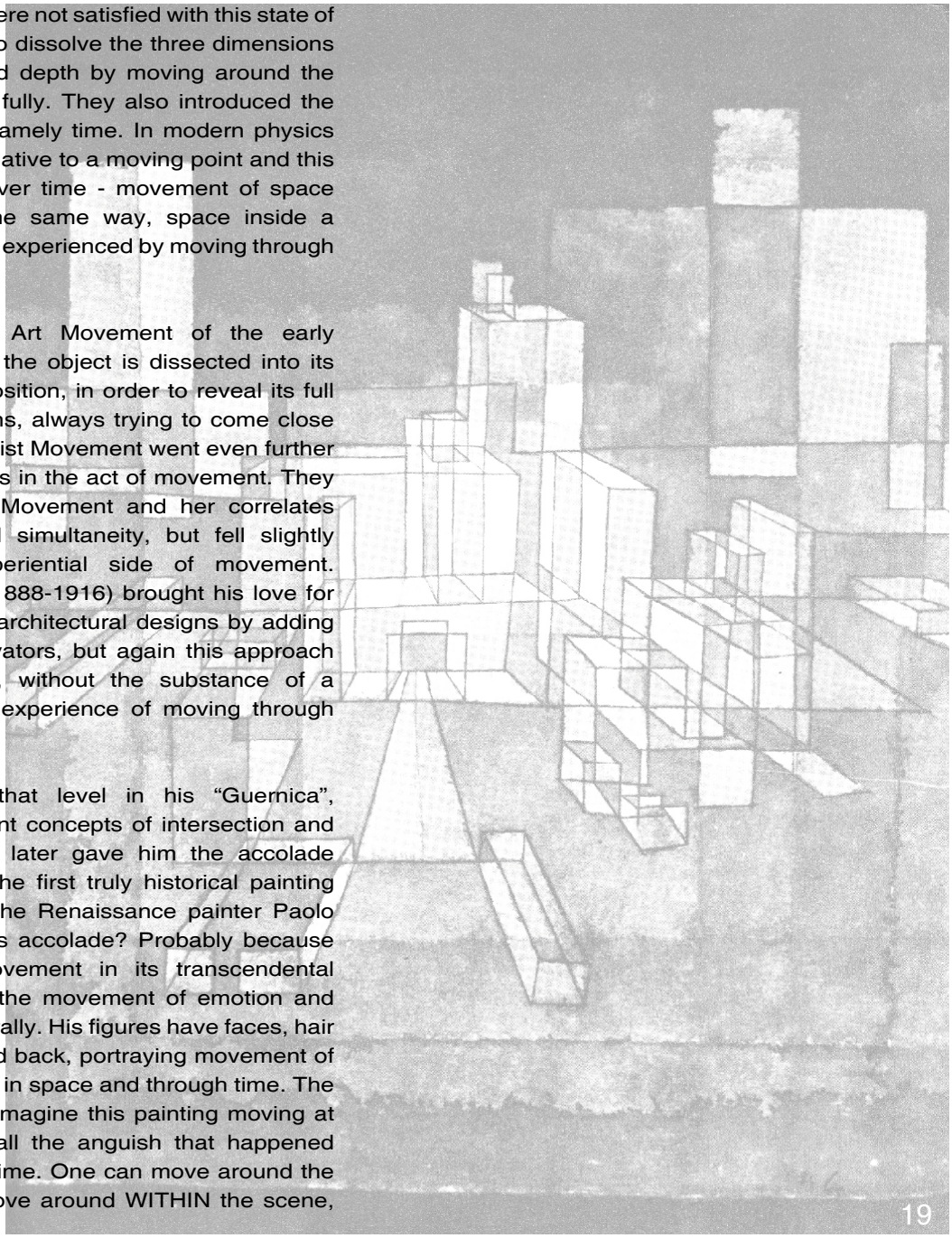
Yet this also makes the impact more powerful. The elements that these two have in common is the fact that they meet over time, change over time and are both dependent on movement in time. Whereas Morris neglects to see time as a unifying factor between both, Siegfried Giedeon notes that the Modern era has bridged the gap of mere space to include time as well (Giedeon, 1976). Movement in art had for years been hampered by the stronghold of the perspective, as the perspective did not allow for movement due to its over-emphasis on space and not time. Depth alluded to visual movement, but that classic idea of space and volume was also limiting the perception to only the visual and not the physical. Feeling and emotive responses were largely ignored and the aspect of time was not taken into consideration.



The early Cubists were not satisfied with this state of affairs and sought to dissolve the three dimensions of height, width and depth by moving around the object to explore it fully. They also introduced the fourth dimension, namely time. In modern physics space is seen as relative to a moving point and this can only happen over time - movement of space through time. In the same way, space inside a building can only be experienced by moving through it, through time.

As in the Cubist Art Movement of the early Twentieth Century, the object is dissected into its parts and its composition, in order to reveal its full harmonic proportions, always trying to come close to nature. The Futurist Movement went even further and depicted objects in the act of movement. They wanted to portray Movement and her correlates of intersection and simultaneity, but fell slightly short on the experiential side of movement. Antonio Sant'Elia (1888-1916) brought his love for movement into his architectural designs by adding fast roads and elevators, but again this approach seemed too literal, without the substance of a Cubist call for the experience of moving through space through time.

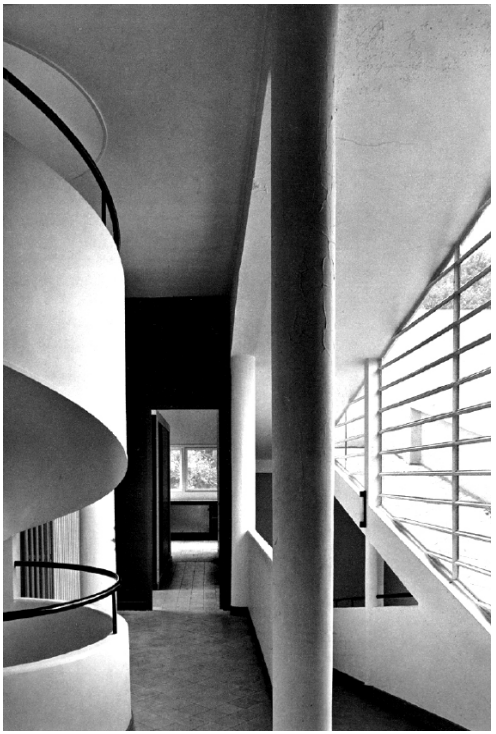
Picasso reached that level in his "Guernica", relying on movement concepts of intersection and simultaneity, which later gave him the accolade of having painted the first truly historical painting since the work of the Renaissance painter Paolo Ucello. But why this accolade? Probably because he understood movement in its transcendental quality, to capture the movement of emotion and not translating it literally. His figures have faces, hair and neck all swayed back, portraying movement of bodies and emotion in space and through time. The viewer can almost imagine this painting moving at him, experiencing all the anguish that happened in that space over time. One can move around the scene, or rather move around WITHIN the scene,



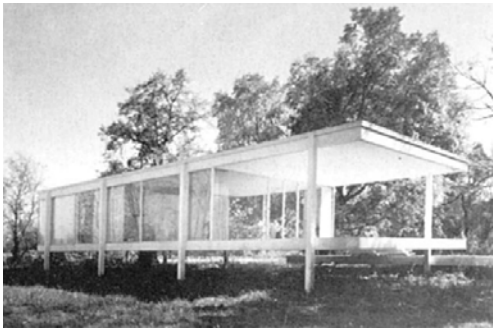
merely because of the fact that that space has been portrayed relative to a moving point.

The effect of this on architecture was amazing. For the first time in a hundred years, Art and Technology started to move parallel to one another again. The findings of the Cubists were proven by science and artists and architects in turn were embracing the new findings in science. Robert Maillart brought back movement into his engineering designs by designing bridges that were both visually moving - through the lines and the planes that were employed - and also structurally moving by employing only the minimum number and size of members needed. This meant that loads and their movement could flow through the whole structure and every member. Every member is now needed to spread the movement of forces and there are no dead and obsolete, lifeless and movement-less members anymore. As Picasso put flowing planes on paper, so Maillart put planes and moving folds into his architecture. Glass was the new material and meant the flowing visual movement inside and out of a building. Fewer structural members were used to increase movement inside a building and make volumes flow into one another.

It must not be forgotten that this Modern form of movement stemmed out of a deep Romantic reverence for nature and the movement within her. When Mies van der Rohe puts his Farnsworth House on stilts to cater for the flooding of the site and when Le Corbusier places his buildings on pilotis, the reasons for these stemmed from a deep understanding of the respective sites, lying within nature and catering for the locally prevailent movement. Working within context and regarding the site and its location means little more than wanting to keep the natural movement of the landscape in harmony. This by letting the site move through the building, letting the eye move through it, reacting emotively to the moving through that space in time. The will to let nature move about freely is to let the harmonic proportions within her move about freely and uninhibitedly. Since music is the closest vessel for the movement of those harmonic proportions, movement in



interior of le Corbusier's Villa Savoye



Mies van der Rohe's Farnsworth House

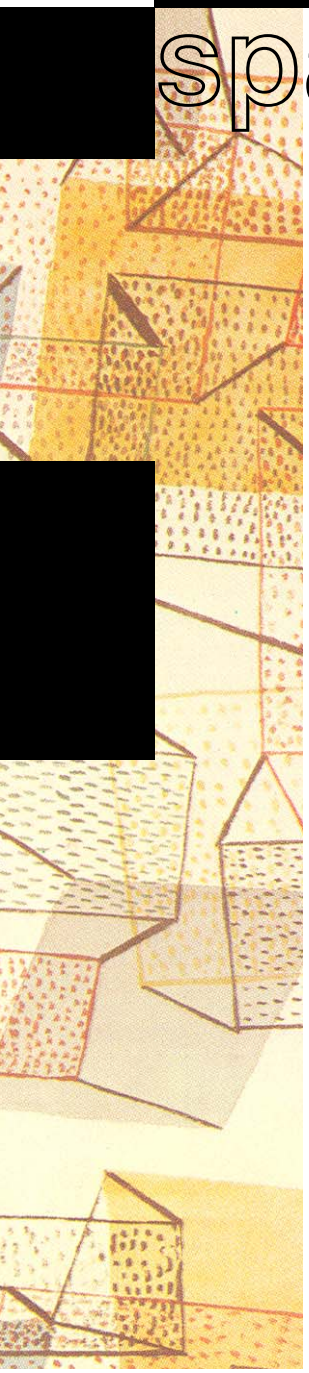
architecture can become experiential when it starts benefiting from the movement within the space of music, in time. More specifically, it is the **perception** of movement that brings quality to these two disciplines and movement brings change and thus interest. Whereas architecture is often fixed, or rather **perceived** as being fixed, movement might make experience more dynamic.

The fault must not be made of thinking that this movement is always blatantly observable. Movement comes about by the arrangement of spaces in such a way as to elicit certain responses from the visitor, like Le Corbusier had his “promenade architecturalle” to arrange spaces along a line of movement and elicit responses by designing volumes, forms, finishes to bring about emotive responses through movement within time. Likewise, the movement within music brings about similar responses over time, where the spatial qualities are arranged in such a manner as to draw the reader and the listener into following the line of movement and responding to those experiences through time.

Heidegger sees being, or rather being in the world (“in-der-Welt-sein”) - which is to be one of those points on the line of movement and perceiving those qualities along the way - as a state that is always dependent on time. Being always looks ahead at death, looks at its life as a whole and also has historical roots. Perception is also important and Heidegger includes the factor that time has to play in perception. When one walks around a table, for example, one gets different visual impressions that are grouped together systematically and through “Retention” or the remembering and recalling of previously viewed aspects of the table one reaches a synthesis in the form the image of a table should assume: a brown, rectangular plane on four feet. Now this table is not just any table, but THAT table in THIS space, the one I am reading this dissertation at, the one at which I wrote a letter to that difficult client. I see them as defined for me, and space and time fuse and enter into a dialectical nature - through the movement through the space the table sits within the time it happens in.

But time is, as mentioned, also referential both forwards and backwards. It brings about hopes of what will still be done on that table and memories of what has happened on that table in the past. Together with this, the table does not sit in isolation in this space and also refers to objects surrounding it. It is positioned far from the window, the window through which I can see my children playing in the garden, the garden in which I mowed

space is the machine



the lawn this morning. The table is the one I have written the book at that now sits on the shelf that is on the wall next to it. Again, all objects in space refer to one another and only movement in time and through space makes this relationship evident. “Protention” (looking to wards future experiences) and “retention” (recalling of past experiences) are necessary in order to become aware of the flow of time during experiences. To realise that what has been experienced in the past will build on any experiences that are currently being made and that will be made in the future.

A problem occurs, when the user becomes part of the space, without being aware that the everyday is a continual flow of experiences building up to future experiences, from past experiences. The user of a city will stop being aware of his surroundings, aware of the influence he has on the surrounding objects and will eventually become unaware of himself. This is a deplorable state to potentially be in, but it is also not far removed from our daily urban existence.

The only solution to this, is to draw attention to the everyday, point to the unobtrusive and go into a relationship with it. This new kind of perception is only possible by bringing planned movement into the city. Few will disagree that Pretoria has energies moving through and within it, but this movement is not very ordered and aware of space and time. When someone is situated in, or is part of, a system that has been designed to move about harmoniously, then the pointing out of the everyday and the unobtrusive becomes possible. This makes the experience of the self as part of the city, as part of the surrounding objects, possible and the interacting nature of space and time is restored. As Bill Hillier puts it: “*Movement is not simply an unintended by-product of spatial organisation, but its very reason for existence. By its power to generate movement spatial design creates a fundamental pattern of co-presence and co-awareness, and therefore potential co-encounter amongst people, that is the most rudimentary form of our awareness of others” (Hillier, 1996: 213).*

The consequence of this interaction with others is that movement results in another implication. Although many people might disagree with this fact, architecture has the potential to disease a society, which the people of the society contract from the symptoms of poorly designed spatial configurations. If an area has started to attract a bad name then this has two results: firstly, many people will want to leave that area and, secondly, be replaced by those (and their respective practices) that gave that area the bad

name. This will then start or accelerate social decay.

The French author Honoré de Balzac in his “Comédie Humaine” sees the social species as a product of their milieu. It should be widely accepted that there is a direct relation between behaviour and spatial configurations. Unlike practices in the field of Social Engineering, I cannot share the thought that there is a direct mechanistic relationship between the individual and his environment, something that is directly quantifiable. Humane science, in other words the quantification of the human and effects on him, is in fact an inhuman deception.

Hillier put this aptly in noting that spatial configurations are to be used to have a response “from space to people and from people to space” (Hillier, 1996: 226). There is thus a social effect that architecture has, not in the building itself, but in the space that is created. “Space is the Machine!” (Hillier, 1996)

Hillier (1996) discusses three concepts:

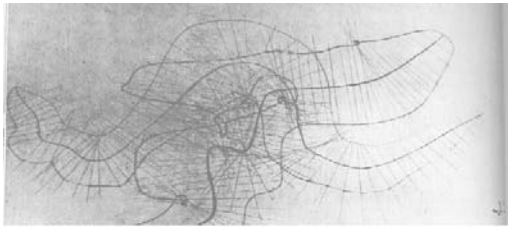
- as spatial elements the parts of a building are difficult to differentiate
- parts of buildings do not move
- people move, independently and impulsively and not prompted by the building

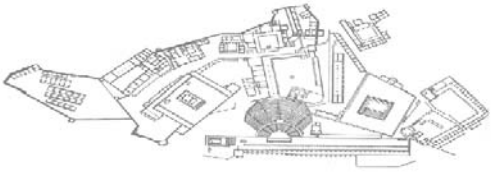
In any building their might be similar spaces, which all seem to have the same effect as the others, but it is the configuration of the different spaces that has a huge effect on the space and the movement through it and can either stifle this or encourage it. Buildings - by the function they contain and the spaces they are constituted of - contain all the social information that already determines to a large extent what happens in and around them. In themselves they constitute a field of potential movement and potential co-presence.

A public square has a certain type of movement inherently connected to it, just like an arcade or a shopping centre would have one. As mentioned before, if a space does not cater for the type of movement it is designed for, then this will cause users to reaction in an opposite direction, resulting in a shift of balance. In all these cases, it is not the building that causes this movement in time through space, but rather the space and its spatial configuration that elicits and promotes movement.

On a more practical level, there will be many spaces with underlying functional requirements and these have to be met by the designer, but then any space is composed of certain elements and the dynamic characteristics of musical movement can still be installed in any space by the determined and concerted arrangement of form, space and light. The following should be heeded to in order to bring about this form of movement through space along time:

- Architecture needs to suggest music’s metrical accentuation through formal accentuation or distinction. This might be done by the arrangement of windows or columns in a certain rhythmic pattern and





comparison of movement systems in the city of Pergamon

University of Pretoria – Meyer, M S (2005)

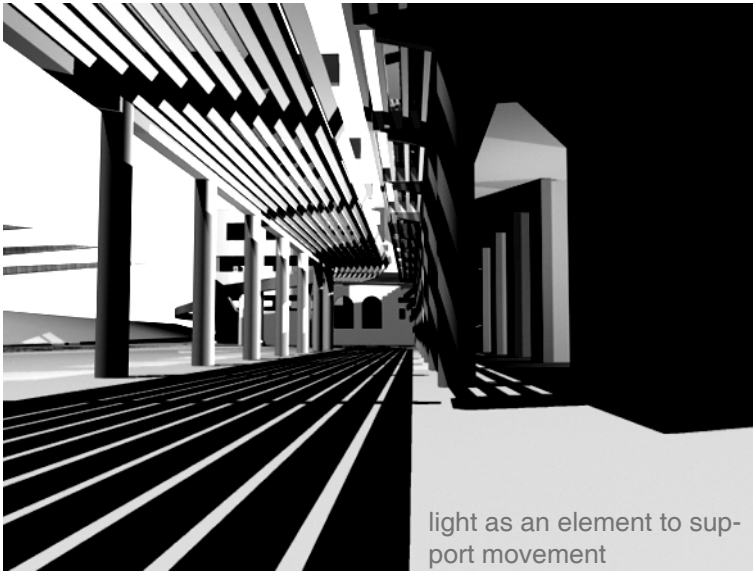
just like music accentuates certain notes in a certain way and at certain intervals, so architectural elements are used to accentuate the path that architecture moves along.

- Architecture needs to simulate movement through the interweaving of spaces and observed form and materials, maybe by changing the size of different spaces that follow upon each other on the promenade, letting them flow into one another, change the balance of a certain room, change the finishing and have a constant play of different scales.

- Light is an important factor in simulating movement in a space, as this is how the space is brought to life and how the feeling moves along with the changing of natural and artificial light. Changes of light along the line draw the visitor along it and build up to something and it is this kind of movement that is wanted.

- Choice of material and surface treatment are important in creating movement through space. This could include things such as texture, colour, light, acoustic properties.

- Architecture needs to stimulate or attract senses other than sight to bring in an overall response by the visitor of the spaces and make him react to his surroundings. This might include touch, hearing, smell and even taste. Senses are the forces by which experience is moved through space in time.



light as an element to support movement

What must be noted here is that in all of these guidelines there is to be no overpowering of the senses. It is desired that the entire person becomes part of the architecture and reacts to it in his whole being, but this will only be possible if the architecture is also able to stand back and create a simple sheet of music for visitor to read easily. Of course, there might be parts where there will be overpoweringly different forms of movement, but this can only work if there are times of rest, pauses in the score, times to reflect on what is being played in the architecture.

University of Pretori G (2005)

pitch duration loudness

9 compo nents

As Morris (Morris, 1996: 70) notes music is composed out of basic acoustical elements. All of these have correlates in architecture.

Pitch: This refers to the highness or the loudness of a sound and the comparison in architecture would be the level of noise a space makes in terms of colour and light. Just as vibrations in sound result in pitch, so do vibrations in light and the more vibrations in light there are the brighter and louder the colour is. To create movement through space pitch must be employed sensibly to either attract or push away the visitor.

Duration: In music this would be the temporal length and spatial length in architecture.

Loudness: This is the intensity of the sound and creates a pattern or story as it changes over time. Like a crescendo, decrescendo, glissando or other music marks change the loudness of a piece over time (be that gradually or instantly), so architecture will be well served with a good balance of loudness. This could be the transition between different volumes, forms and spaces of loud and silent.

Timbre: The same note of music can sound differently by changing the instrumentation. In architecture, colour, texture and finishing are all “instruments” in their own right and have their characteristics to add. When transcribing a piece of music into architecture, such a palate of materials is chosen.

Rhythm: This is a very prominent factor in music and during which the listener is prepared for something to come. Rhythm can build up to a climax or be the stabilising factor behind a composition by creating or releasing tension. An architectural composition will be enriched by the proper employment of rhythm for these purposes. It creates the necessary balance needed. The rhythmic aligning of columns or spaces, varied articulation of forms or components and the hierarchy of elements might do this.

Harmony: Music needs harmony and blending of tones to create musical space, depth of experience and a certain mood. The Platonic idea of

Universi · Meyer, M G (2005)

timbre rhythm harmony

intervals has been discussed and both consonance and dissonance have parts in the composition. Rhythm and the balance of these factors are important to create tension or to release it. In architecture one must look at the composition of spaces - materials and volumes that make these up. The spaces have to be well balanced and form a harmonious (or in certain cases dis-harmonious) whole to elicit a certain response from the visitor.

Phrasing: Like phrasing in a piece of music, where certain parts are treated in unison, so materials might be grouped together. Openings along a wall or a plane are also grouped into motifs that repeat over time and according to a rhythm. Organization and variation are integrated into architecture for the proper translation of melody, harmony and rhythm.

Orchestration: An understanding of the instruments and their characters is important. Like each instrument has its own character and role it can play, so certain materials can only perform certain tasks. Materials should be used in a manner that is true to their character.

Proportion: Following through from Greek musical theory to contemporary composition, this is one of the oldest unifying factors between music and architecture. It is also a tool for translation from any art to the other and still have measurables that are quantifiable. Yet, it does not exclude the imaginary and qualitative.

Melody: This is a line consisting of sequences of pitches of distinguishable height and rhythm. The shape of this melody has direction, rises and falls, expands and contracts. A score as a musical line can describe shapes in the minds of the listener. Architecture is no different. It creates forms that rise and fall and evoke feelings of the visitor by creating a melodic horizontality.

phrasing orchestration

melody proportion

After it has been established that the common ground where music and architecture meet in time and through space is movement, this movement has to be examined closer. Movement in all its forms occurs only linearly, since there is the factor of a point moving at a certain time in a certain geographical location. Every point has its own characteristics, plays its own note on its own instrument. Every point gives birth to another point, due to the characteristics of the point and thus a line is created.

A line is nothing more than a continuous movement of points, giving birth to more points. The characteristics of these points depend on the characteristics of their parent point, as they will react, be that in rejection or acceptance, to the point that created them.

To understand this architecturally, the process of "arborescences", a concept introduced by Xenakis in his compositions, must be considered. The city has already been described as a tree (whereby others have asserted the opposite, albeit on completely different grounds) and likewise the movement patterns in a city, when put in as lines of the composition, can branch out and form an intricate form of simultaneous linear movement systems. The process is very simple:

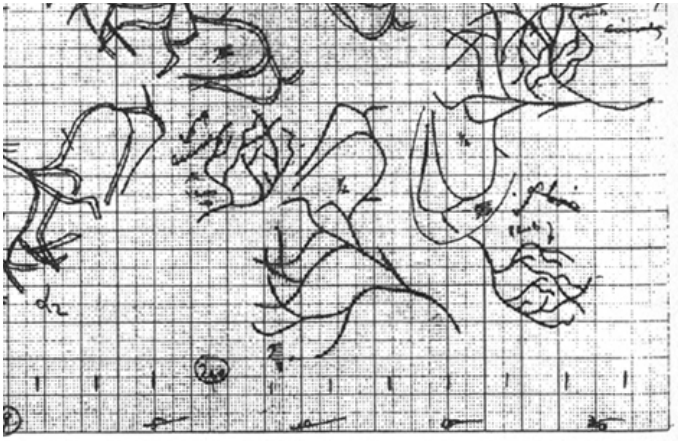
- Start out with a point in space (pitch vs time/space, etc.).

- In order for it to exist, it has to continuously repeat itself – a line of any shape is formed.

- Any point on the line can also reproduce itself and bring about arborescence – a bush comes about (this can occur freely, but also according to rules).

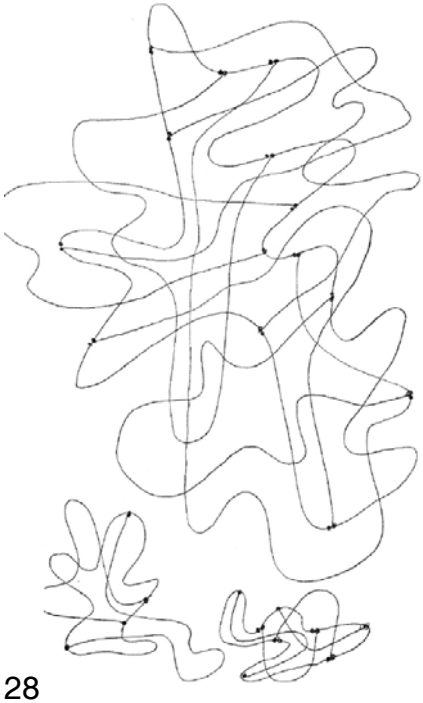
- Rotate or transform the tree; treat trees as a group. Use the inverse of the melody, its retrograde, retrograde inverse. Many possibilities exist to change this shape and thus the character of the whole.

These points in the line have their character that stems from the context they lie in by moving in time and through space. These consequential points/notes give us a line and this line represents the melody and this melody can now be transformed, rotated to



example of an arborescence of iannis xenakis

lines of movement/ melodies branching out to form the total movement system



points becom-ing lines and lines/ melodies moving simultane-ously

give us a new melody. There can also be more than one melody playing simultaneously. This score is made more interesting when these systems are put on a grid, in this case the grid of the city, and we get another process, where the cells are treated in a similar way as the points of the line. This process is called “arbor-grid” and is:
Start with a grid on paper, where the vertical lines represent the time divisions and the horizontal the pitch. Start at any given moment, at any given vertical line, at any given pitch – in other words a cell. This cell has its own character due to the position it takes up in space and time. What is the next moment going to be? What notes? The filled cell (because of the nature it has, just like the point and its nature) gives birth to another one or two adjacent cells. In this way the whole grid of paper can be filled.

Just like the grid on the paper is filled, all these cell blocks are evident in a city and every cell has a certain shape and character. This is because of the cell or cells that lie next to it, just like it exerts an influence on the cells around it. A city -and Pretoria is no exception - sits on a Cartesian grid, with energies flowing through it. Any point exists at a certain time, within a certain spatial context, at a certain pitch, energy level and emotive level. The points form part of lines that are the movement systems existent in the city. These lines flow over the cells and there is an interesting marriage between the points that form part of

the movement systems and the cells through which the movement systems go. Both of them live in an interactive relationship and again, like the points relate to one another, so do the lines and the cells have a constant dynamic exchange. Bacon (1968) refers to the simultaneous movement systems in terms of three concepts, namely the

- **relationship of mass and space** (space is the dominating element - respond to it as a basic element in itself and conceive abstractly in it)

- **continuity of experience** (life is a flow of experiences, an unbroken continuity of individual extensions into space in time, each moment of which is affected by and in turn affects the moments and experiences that precede and follow it)

- **simultaneous continuities** (given the problem of design to take cognisance of the total experience of each individual who lives within the city, it becomes necessary to conceive of the continuity of space experience in terms of a series of movement systems, each based on different rates of speed and different modes of movement, each interrelated with each other and each contributing its part to the total living experience in the city)

Each of these are elements of the greater arbor-grid (arboresence on a grid) of the city. Just like the arbor-grid, the “strength of the plan lies in the ability to influence growth, just as the seed has within it a force that causes the cells to group themselves according to an order without which the organism cannot grow”.

all quotes on this page from Bacon:311

"The trunk of the tree is a clear directive which establishes the path of the movement of thousands of tubes which diverge in the branches and finally deliver the chemicals necessary for growth to the outermost leaves where they are transformed into food. The water acts as the fuel to propel the chemicals to the point of consumption, and it, in turn, evaporates into the air and flows through the cycle of movement systems based on weather phenomena…So in cities, the points of connection between systems should be places of special emphasis and design enrichment."

"As the movement systems become clearly defined and purposefully established – even though they are modest in extent to begin with – and as they are used by more and more people over time, they become established in the collective psychology of the community. As natural outgrowth, logical extensions, increased continuities, variations and enrichments occur, each related to the central movement system just as surely as the branches and flowers are related to the trunk of the tree."

"This simultaneity of various themes brings to mind the great art of music: themes are played against sub-themes, several different themes are played against each other simultaneously and with variations and themes that were played at the beginning are recalled throughout, giving continuity, unity and total form to a composition."

As John Ciardi says: "The words of a poem, when spoken most meaningfully, must not only speak themselves dramatically, but answer lovingly to the rhythms from which they have emerged, and anticipate as lovingly the rhythms into which they are flowing."

"The creative process of establishing a movement system is just as difficult, or perhaps even more difficult, than the creative process of writing a piece of music, composing a poem or designing a building. It is not my intention, nor would it be possible, to explain what this process is. It can only be felt by those who have within themselves the quality of being an artist. I am trying to give a frame of reference within which the artistic genius of a designer can be related to the city problem."

As much as I feel it necessary to design a movement system that takes into account harmonious movement in time through space, a system that creates meaningful perception of experiences, I feel it necessary to bring in the idea of improvisation.

It is important to set up the main theme, the melody, for the score of the city, but just as some serialist composers realised that there is only so much one can do with 12 notes, so we must realise that the nature of the city is far too complex to determine what each instrument will play and how everyone will react to his part of the movement system. The end-user will decide on how he hears the melody - that is the nature of an audience that can filter quite clearly what is received - and will naturally react to what is being heard. This reaction is also in the form of an improvisation on the melody, the line of movement of people. How he perceives the city will depend on how the movement systems support this search for identity through proper perception by harmonious movement in time and through space. The man or woman in the street reacts to this and by doing just that improvises, reacting to his nature of being a human, an improviser to a constantly changing context.