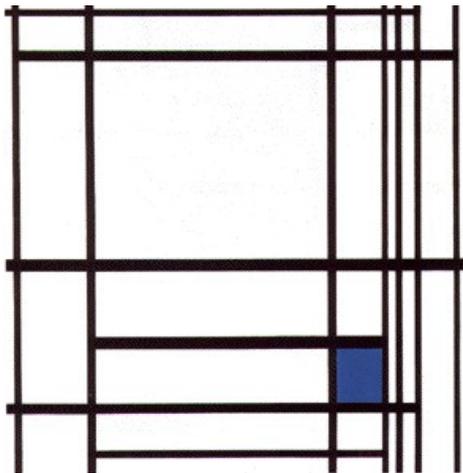


## MA 20<sup>th</sup> Century Art and Design: Histories and theories.

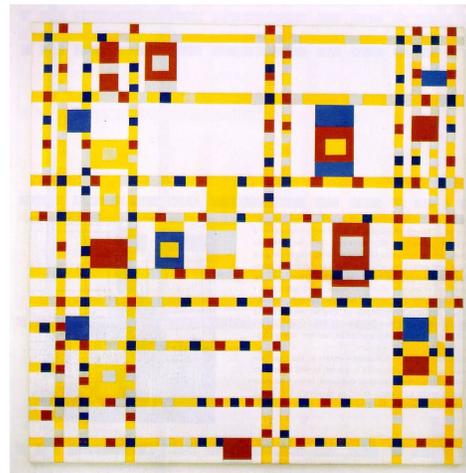
### Assignment 8: *Euclid, Mandelbrot and all that jazz*

#### Introduction

The central theme of this essay is the shift in Mondrian's painting from the dominant black lines of his neo-plastic works spanning the 1920s and '30s to a proliferation of colour in his "*Boogie Woogie*" canvases of New York in the 1940s. This is illustrated by reference to two paintings (Fig 1), one made before Mondrian arrived in the USA and the other from his New York period, just before his death:



*Fig 1* *Composition de lignes et couleur III*,  
1937(80x77cm)



*Broadway Boogie Woogie*, 1942-3  
(127x127cm)

Mondrian himself was convinced of the progress he was making with *Broadway Boogie Woogie*. In 1943 in a postcard to his friend the critic and historian James Johnson Sweeney, he wrote:

Only now I become conscious that my work in black, white and little color planes has been merely drawing in oil color. In drawing, the lines are the principal means of expression; In painting, however,

the lines are absorbed by the color planes; but the limitations of the planes show themselves as lines and conserve their great value.  
(Blotkamp, 1994: 240)

As though to underline the significance of the work, Mondrian chose a title for his painting which referred to his environment rather than his usual practice of neutral labels like “composition”. The title refers not only to where the canvas was painted, but also to Mondrian’s favourite dance<sup>1</sup>.

In his *The True Value of Oppositions in Life and Art* and elsewhere Mondrian argued in favour of trying to reconcile a series of binary oppositions such as good and evil through painting:

generally in life we readily perceive oppositions as particular forms, but we fail to see them as relationships. Yet it is precisely the mutual relationships between the elements themselves that determine the whole.” (Holtzman, 1987: 284)

It will therefore be unsurprising that from time to time in this essay Saussurian dialectics such as vertical/horizontal, conscious/unconscious, intellectual/intuitive and so on pop up. One of the more interesting of these oppositions which Mondrian worked to harmonize was chaos and order in nature. He tried to do this by isolating some universal underlying structural truth. He said of natural complexity “it is so simple if only one understands a little the great laws that are more or less hidden in natural appearance” (Holtzman, 1987: 288)

In this essay I discuss the ways in which certain features make the later work unique, and then offer an explanation of why the changes took place. My observations are largely formalist, with much of the argument being informed by

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<sup>1</sup> True, there were earlier signs of descriptive titles; for example *Composition IV: Foxtrot A* of 1929, but the wording was tentative, the dance name being subordinated to the usual neutral reference.

Arnheim, Krauss and Bois, but because Mondrian used geometric forms as a metaphor for the order beneath nature's complexity, the essay is also in places mathematical. In particular I suggest that *Broadway Boogie Woogie* shows signs of Mandelbrot's fractal geometry<sup>2</sup> where up to that point his work had been dominated by Euclidean structure.

### **First impressions**

*Composition de lignes et couleur III* is a typical example of neo-plastic painting in the *de Stijl* fashion. It consists of a series of vertical and horizontal lines crossing one another to form a grid. The lines are of varying thickness and are spaced irregularly. In spite of Mondrian's stated intention to destroy the hierarchy of marks on the canvas, and to provide an "all-over" there remains a natural centre of symmetry to the canvas which is formed notionally by the intersection of the two imaginary diagonals joining the corners of the canvas. All of the shapes in this painting work to balance the whole around this centre point (or around some imaginary line passing through the centre), but without pointing to it in an obvious way. By contrast in *Broadway Boogie Woogie* there is a vertical white oblong whose centre coincides precisely with the centre of the square. This is an audacious feature never seen in Mondrian's earlier work. Having dared to do this in *Broadway Boogie Woogie* however, Mondrian still manages to avoid the allusion to a mimetic vanishing point through his technique of balancing features eccentrically around the central fulcrum; a sort of lever principle. Lines, colours and shapes are all designed to "pivot" around the centre, perfectly balanced.

This "pivoting" is shown in the way that the large white oblong in the upper half of *Composition* is counterbalanced by the small blue plane in the bottom right hand quadrant. Apart from this the painting is black and white. The use of a small patch of colour to balance the bulk of the largest white oblong is a classic example of Mondrian's highly developed intuitive sense of how to control the viewer's eye.

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<sup>2</sup> See below for more details

As well as being balanced by the blue patch, the large oblong is also offset by borders made up of four vertical lines in a geometric series to the right of the oblong, and the collection of horizontals below it. The oblong is anchored to the picture plane by the device of continuing its outlines to the edge of the painting. There is a comfortable stability in the image, but at the same time a sense of movement which one can identify with Mondrian's expression "dynamic equilibrium".

*Broadway Boogie Woogie* is a more complex painting by comparison. The initial impact is one of bright colour, oscillating across the picture plane. The painting consists once again mainly of a number of lines crossing each other. But here the horizontals and verticals are not the black homogeneous lines of *Composition*, instead they consist of sequenced patches of aligned colour: red, yellow, blue, black and grey. In *Broadway Boogie Woogie* the intersections of the lines do not strike as crosses, especially since the colours of the crossing points are not in any way a logical combination of the colours of the two lines which cross at that point. Gone too is the optical illusion of a grey oscillation seen when black lines cross. In one fell swoop Mondrian has destroyed both the line and the intersection as hierarchical components.

In spite of the innovations, in retrospect Mondrian was not entirely happy (Bois, 1995: 293, 361). Note that there are no white patches in the coloured lines; the only "non colour" is grey. This means that the lines remain distinct from the spaces between the lines, enhancing the figure-ground relationship he had previously tried to destroy. Note also that primary colours are actually touching one another, risking an element of optical mixing.

### **Lines: Conception vs Perception**

The most obvious feature of each of the two paintings, the line, deserves closer attention. The reception of a line is not simply the neurological excitation of the

optically active regions in the brain. Cultural and psychological experiences are also involved in shaping our perceptual responses to lines. To Mondrian the theosopher<sup>3</sup> there was a symbolic association with lines (vertical represents male and horizontal female). To others who might have served time in prison, vertical lines may have other connotations. To a physicist or a chemist the horizontal lines speak of elemental emission spectra, and the verticals of the atomic energy levels from which the spectra arise (bizarrely resonating with Mondrian's search for pure elemental content). Lines are (like a representational image) in danger of being particular to the viewer, rather than universal.

The straight line, is a mathematical construction which has no reality in nature. When we "see" lines in nature what we actually see is the boundary between adjacent areas. Consider the example of the horizon. However closely we examine the horizon through telescopes, we can never see an actual line. So the drawn or painted line is never anything other than a signifier to a signified mathematical notion, a simulacrum. The drawn line will always have finite width, yet the mathematical line (as expressed algebraically) has none.

Mondrian's lines are in fact strips of varying width designed to control the positioning of the observer's eye and the way in which it moves across the canvas. For example, when the spacing of adjacent lines diminishes geometrically as in the four vertical lines on the extreme right of *Composition de lignes et couleur III*, there is an accelerating effect which adds dynamism.

There is a similar effect achieved by varying the width of the lines, creating some illusion of depth. Both devices rely on our preconditioning to Renaissance perspective, where objects seem smaller the further away they are. In spite of

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<sup>3</sup> Mondrian came to the universal religion of theosophy in the early years of the century and continued to be a member of the Theosophical Society for the rest of his life; the only books in his studio when he died were on Theosophy.

Mondrian's stated intention of eliminating any three-dimensionality, there is much evidence of its use.

These devices are replaced however in *Broadway Boogie Woogie*, where we see both particular and perspectival expectations of the line effectively subverted. First the replacement of black with strips made up of colour patches; no matter what our previous experiences most people expect lines in a grid to be monochromatic. The broken colour therefore has the effect of destroying the Renaissance properties of the grid and replacing it with a coruscating rhythm which makes the grid a new feature in itself. Second, the lines are now virtually all the same width which weakens the possibilities of perspective. Lines which in *Composition* created motion by means of their varying width and spacing now instead contain a temporal dimension within themselves as a result of the colour.

This novel use of variable colour in line has its down side; it privileges the grid and returns Mondrian to the position of pushing the white spaces into more or less a single ground, an effect that he had previously struggled to avoid.

### **Lines: Horizontal vs Vertical and in-between**

The fact that we live in a world with gravity means that unavoidably there is a fundamental difference between the way we perceive horizontal and vertical lines. Even though Mondrian is known to have painted his canvases when they were horizontal on a table (Cooper and Spronk, 2001: 47) there is acknowledgement that gravity is a vital part of our process of perception. On the back of his paintings Mondrian would write the word "haut" to indicate which way up the canvas should be hung. Clearly, for him vertical and horizontal were distinct and should not be interchanged; if the painting were hung differently from Mondrian's intention, it would not have the same effect. This is partly because our eyes give more weight to the base of an image than to other parts<sup>4</sup>.

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<sup>4</sup> so much so that framers cut mounts wider at the bottom of a picture than at the top in order that the frame does not look top-heavy.

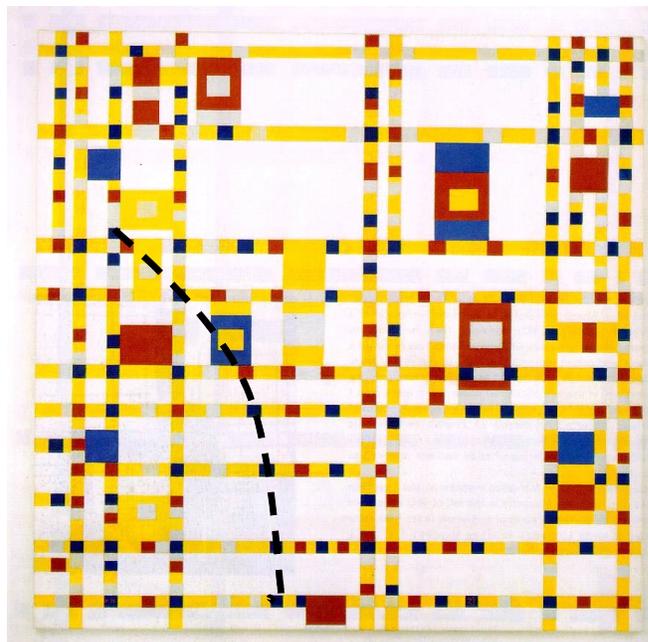
Vertical lines differ from horizontal ones in another very important sense, namely their perceived stability in a gravitational field. Here it helps to appreciate the difference between stable and metastable equilibrium. In the latter any small disturbance will cause catastrophic instability; for example a rod balanced vertically on end will fall over if only slightly displaced. The same rod resting on the ground however is in stable equilibrium since it will return to its position of rest after a small displacement.

As for horizontals, Arnheim points out that because we read from left to right (in the West) we assign a different significance to objects on the left of a picture from those on the right. There is a “dynamic vector leading from the left to the right of the visual field” (Arnheim, 1974: 33) When two objects of the same size are shown in the left and the right of a picture the one on the right looks larger. In order for the eye to see them as equal, the one on the left needs to be drawn larger. Thus in *Composition de lignes et couleur III* the vertical lines on the left of the work are thicker than those on the right hand side, and those at the bottom are heavier than those in the top half. In this way balance is sustained.

The use of geometric progressive spacing gives an impression of velocity. Mondrian was conscious of this and when the sculptor Calder suggested he made mobiles out of Mondrian’s images, Mondrian replied “no, it is not necessary, my painting is already very fast ” (Freidman,1986: 85). To ponder further on velocity, Arnheim observes that “By connecting two or more spots through similarity, a painter may establish a significant visual movement.” (Arnheim,1974: 89) The repeated motifs of not only vertical and horizontal lines but also the intersections or crossing of lines and the optical illusion of the grey patches appearing at the intersections achieves this movement to an extent in *Composition de lignes et couleur III*.

There are also many intersections in *Broadway Boogie Woogie*, although because the lines are made up of coloured patches, there is none of the optical

illusion seen when black lines cross. The scintillation in *Broadway Boogie Woogie*, comes from the alternation of colour along the whole line, not just at the intersection. It also comes from inter-line association. The eye, for ever seeking pattern, will join together patches of the same colour distant from one another to make a non-vertical, for example starting with a blue patch one third along the bottom line, and close to the red oblong links readily with the blue patches in the five lines above (see dotted line below Fig 2).



*Fig. 2 Non-rectilinear patterns shown by my dotted line*

In this way Mondrian has enhanced non linearity and obliqueness in the image. This oblique and curved linking of coloured patches on separate lines of his grid adds a new kind of dynamism or “boogie-woogie” not seen in the earlier works.

### **Inner space vs Outer space**

One aspect of the changes seen in *Broadway Boogie Woogie* which may be more difficult to visualise, but which is nevertheless important to consider is that of space. Mondrian was concerned throughout his life to link his painting to the

outside world. This was part of his Utopian vision of neoplastic extending to music, architecture and eventually all aspects of man's everyday existence.

Krauss (Krauss, 1980) pursues the question of whether Mondrian's grids are self contained within the limits of the canvas or represent a section from a much bigger grid, a window on the world as it were. She distinguishes these two views of grids as either centripetal or centrifugal, respectively. *Composition de lignes et couleur III* is decidedly centripetal. Other paintings are both centripetal and centrifugal, because Mondrian carries some lines to the canvas edge and others he truncates. This technique is also used in *Broadway Boogie Woogie*, but here colour plays an extra rôle. The use of yellow alone where the gridlines leave the canvas at the left-hand and bottom edges encourages departure, but the mainly red ones at the top of the canvas stop the eye.

In Cooper's seminal materialist study *Transatlantic Paintings* there is great attention paid to the detailed brushwork and texture of Mondrian's paintings which can be seen on close inspection. It might be argued that to ignore the carefully sculpted brushwork, which was undoubtedly intentional, does an injustice to the dialectic of the subjective and the objective. However, it seems to me that Cooper's intense focus on the paintwork sides so uncompromisingly with Krauss's "centripetal", that it unbalances the harmony of the outward-inward dynamic, and therefore it does not feature in this essay.

Schufreider<sup>5</sup> discusses the idea that in *Broadway Boogie Woogie* the artist managed to expand the space of the painting to join the space of his studio and the so-called "wall works"<sup>6</sup>. He traces the role of the grid through Mondrian's life, observing that in New York he had long abandoned the modular structure where the grid performed the job of decentralising in favour of images where the grid itself became more of a subject, using other "eccentric" devices to do the de-

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<sup>5</sup> Professor of Philosophy Louisiana State University

<sup>6</sup> Patches of primary colour arranged on the walls of his studio

centring. *Broadway Boogie Woogie* represented the final stage of this evolution, following on as it did from the double-dated<sup>7</sup> paintings:

This liberation of the color plane from the grid ... shows, I think, Mondrian struggling with and for another space, the space, I would argue, that belongs to the new harmony that he has been attempting to clarify...It is this struggle for space that will invite further transformations of the grid in Mondrian's late work: first, in his experiments with both its multiplication and coloration in the New York City series and, eventually, in its deconstruction in his final paintings, in which **he was able to bring the dynamic order that he had struggled to display even more clearly to the surface by infusing it into the grid-structure itself, through an explosive return to color after a long period of work in primarily black and white.** [my emphasis and elipsis] (Schufreider, 1997)

Thus, the laying of coloured patches along the lines is seen as the last in a series of “destructions” which characterised Mondrian’s work from the outset. *Broadway Boogie Woogie* represents an opening of space in the Wölfflinian sense, moving from the monochromatic unity of the earlier grid to the coloured multiplicity in the later painting.

The emphasis that Mondrian placed on the arrangement of his studio, with primary coloured oblongs situated carefully on the walls, support the argument that he was trying to link his canvas with his environment. Moreover, in New York, the view from his studio window must have seemed like a further extension of the same images. Thus we have in *Broadway Boogie Woogie* an emphasis on the harmonization of internal and external space.

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<sup>7</sup> So called because they were begun in Europe in the late 30s and reworked in America in the early 40s

### **Chaos vs order in nature**

It was Mondrian's intention according to both his extensive writings and paintings to simplify and capture the pure essence of nature through his work. Overwhelmed by the complexity and variability of the natural world, he focused on developing a set of geometric artefacts that he hoped would represent the underlying rules, and moreover from which others would be able to construct an utopian environment. Mondrian was for ever seeking to replace the "particular" by the "universal". In his important essay *Plastic Art and Pure Plastic Art* Mondrian summarised his understanding of "universal reality" which "establishes expansion and limitation-the creative factors of space-through neutral forms, free lines and pure colours" (Holzman, 1987: 288).

Although he takes care to correct the view that he is anti-nature, Mondrian's grid paintings seem to be as disconnected from nature as one could possibly get. They seem to say much more about the man-made world than our natural surroundings. Krauss in her essay *Grids* (Krauss, 1980: pages unnumbered) describes them as "anti-natural, ant-mimetic and anti-real". Mondrian's dislike of green and his tendency to turn away from windows which overlooked countryside reinforce the suspicion that his view of nature was at the least ambivalent.

The austere black lines which form the main structural backbone of most of his paintings seem to echo his Dutch Calvinist upbringing, acting as a metaphor for the rigidity of a strict religious culture. Admittedly, colours enrich some of the oblongs and squares formed by the intersecting lines, but again as if searching for rules that limit the risk of chaos and the particular, the colours had to be "pure" primaries and could never be placed directly in contact with one another. Only the primary colours red blue and yellow were permitted in the inter-line spaces, since they were as far away from the particular colours of nature as possible and as close as he could get to what he imagined were the "pure" building blocks. In his earlier work, they had to be separated from one another by either white or occasionally black. This device reduces the effect of optical

afterimage tainting the purity of the primary. In New York all of this changed, and one of the most striking innovations in *Broadway Boogie Woogie* is the widespread placing of primary colour patches directly next to one another. Even so, red and blue and yellow were still often separated, by yellow or grey. This use of grey fits with Ostwald's view that "grey was the chief controller of harmony" between the primaries (Gage, 2002: 259)

The novel use of colour in *Broadway Boogie Woogie* certainly makes the painting more complex than earlier ones, and apparently more chaotic. But a closer look at the geometry of the painting will reveal perhaps surprisingly quite the opposite.

### **Euclidean vs Fractal Geometry**

Apollinaire wrote: "geometry is to the plastic arts what grammar is to the art of the writer".(Shearer,1992: 143). Artists are not mathematicians, yet the links between the plastic arts and mathematics are historical and strong. Geometry in particular played a seismic role in the Renaissance, when the invention of linear perspective stimulated a new way of painting.

Threllfall (Threllfall, 1988) devotes a large part of his thesis to a classical geometric argument, giving some convincing examples, but it is generally the view that to look for evidence in Mondrian's work of the golden section (the ratio 1:1.67), or any other naturally pleasing mathematical relationship for that matter is misguided. Joosten for example:

Mondrian...struggled to correct the misconception that his art could be characterized as geometric. He insisted again and again that he did not work according to a system, but rather that intuition served as his sole creative guide...Countless attempts have been made to decode the supposedly fixed and mathematically proportional relationships within his work. All such efforts have been fruitless,

since it is demonstrably clear that Mondrian's work was anything but systematic or mathematical. (Joosten in Bois et al, 1995: 295)

It is not necessary to side completely with Threlfall to challenge Joosten's case, however. Although we can be clear from his writings that Mondrian consciously avoided it, it is still entirely possible that he produced geometrically structured images intuitively. After all, the "magic" ratios are exactly that for rather deep unconscious reasons.

The dissatisfaction with classical geometry as a language for the universal "truth" of nature began to show at the turn of the twentieth century when the discussion around non-Euclidean or curved space, and the so-called fourth dimension stimulated much activity amongst artists (Henderson, 1983). Mondrian shared the theosophist view that art must transcend the particular to find a new universality, and the *de Stijl* view in particular that this should be achieved through mathematical harmonies which they felt existed behind the visual impressions. Van Doesburg the leading light of the *de Stijl* group wrote in 1917 that:

When the new plastic artists use mathematics, they may be compared to a Renaissance artist using anatomy. No more can we make a Renaissance work of art by a great deal of anatomical knowledge, than a modern work with a thorough knowledge of mathematics (including the four-dimensional). By mere mathematics we shall never be able to compose a painting; with mathematics, however, **we may do very well**. [my emphasis] (Henderson, 1983: 314)

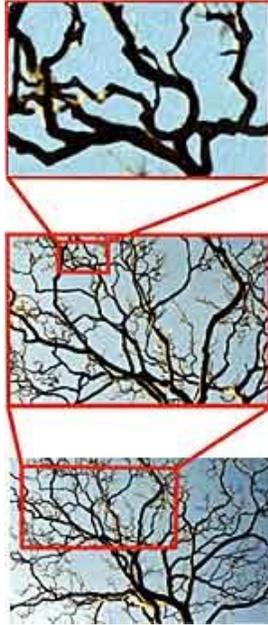
While Van Doesburg and others were sufficiently interested in the curved spaces and the "fourth dimension" to continue working with the concepts, Mondrian was quick to abandon them. In 1918 he wrote to Van Doesburg:

I am very much interested in your effort for a four-dimensional view, but it is my opinion that we cannot visualize much of four-dimensionality, since one needs another sense for it, as I think I know from occultism. (Henderson, 1983: 316)

Of course Non-Euclidean geometry has not been the last word in mathematics. A more recent advance in understanding the apparently chaotic shapes found in nature is to be found in fractals. The forms of clouds, blood vessels, coastlines or mountains seem to have an unrestricted complexity, but they nevertheless have a geometric regularity, their scale-independence. That means, if we analyze the structure on different scales, we will always find the same basic elements. This discovery by the mathematician Mandelbrot in 1975 which led to the development of fractal geometry has provided us with a much more convincing structural explanation of the vast range of particular natural forms which overwhelmed Mondrian, and which has driven so many artists to search for the universal, pure and simple. Mandelbrot's entry into the discourse of the aesthetic with his claim that fractal geometry "mirrors nature" has ruffled feathers. Gray for example points out that fractal geometry is merely another representation of a representation (Gray, 1991), refusing to acknowledge that it speaks more profoundly than other theories of the aesthetic.

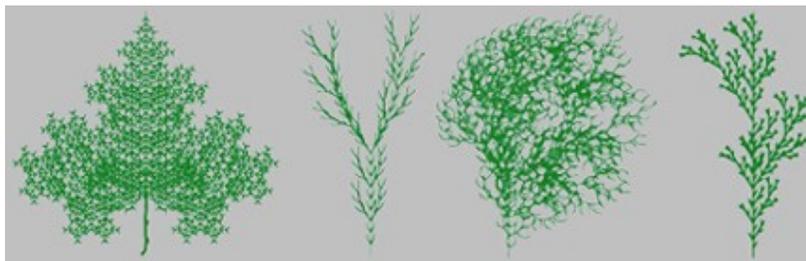
Notwithstanding the debate, there is I believe worth looking more closely at the fractal approach. While the familiar forms of line and oblong have dimensions of one and two, respectively, the dimension of a coastline or a plant or a cloud turn out to be fractional, not integer. This is not the place to elaborate on the theory behind fractal geometry, but in lieu of a more rigorous account it may be helpful to briefly illustrate the most accessible feature, "similarity".

When a fractal structure is examined at different scales it is similar. Take the example of trees:



**Fig 3.** Photographs of trees showing similarity of scale

These photographs of trees (Fig 3.) have an element of chaos in them, yet we can see that there is similarity of structure over several scales. The images below of plants are not photographs (Fig 4), they are computer-drawn using simply the straight line beloved of Mondrian, but here in combination with instructions to turn through an angle at certain points and with a particular frequency<sup>8</sup>.



**Fig 4.** Computer generated plant forms using fractal geometry

<sup>8</sup> These patterns were generated by the Lindenmayer System which reduces the high information of plants through short instructions of the type: rule = "l [ + l ] l [ - l ] l" where l = line + = + 28.58 degrees - = -28.58 degrees [ = start of a branch ] = end of a branch.

Instructions are not exclusive to mathematics, but are familiar to us in our everyday lives. For example, the apparently chaotic movement of traffic around a busy roundabout can be understood by knowing one instruction: give way to the right (or left).

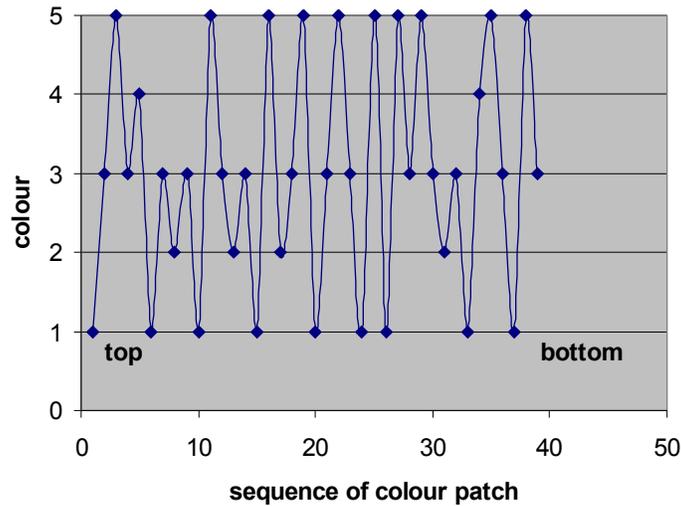
Richard Taylor has studied the “random” drip paintings of Jackson Pollock and shown that in fact they comprise ordered patterns with a fractal dimension ranging from 1.1 to 1.9 depending on the period of his life during which they were painted. He also reports experiments in which viewers found more pleasing images with fractal dimensions between 1.3 and 1.5, similar to the range which appears mostly in natural structures (Taylor, 2002).

Shearer makes the interesting observation that:

This new fractal thinking also challenges the polarities that have been long used as conventions to describe art. The dualistic thinking of geometric art as being reduced to categories such as organic versus inorganic, irrational versus rational, individual versus universal or subjective versus objective now loses its meaning. (Shearer, 1992: 150)

Because fractal geometry acknowledges the existence of dimensions which are not integer, it provides what one might call a post-modernist geometry of nature. It fills in the “grey” bits between binary oppositions of two Euclidean integer limits. Taylor examines Mondrian’s earlier paintings and concludes that since they are so simple they must be wholly Euclidean. However, Taylor’s analysis did not extend to the later works, and while this may be true of the neoplastic paintings up to 1943, the same may not necessarily be said of *Broadway Boogie Woogie* and *Victory Boogie Woogie*.

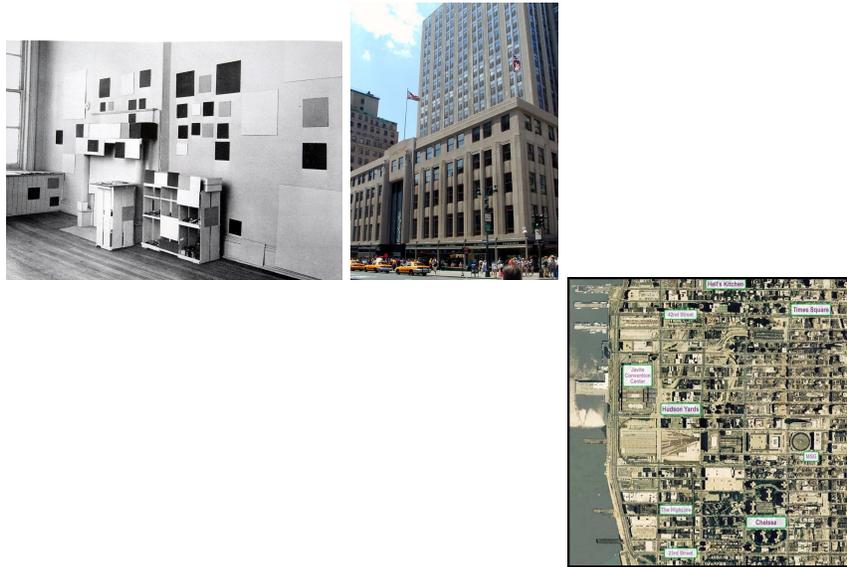
Lorenz (Lorenz, 2003) takes up this point by following one of the verticals in *Broadway Boogie Woogie* plotting out the sequence of colour in the following way:



*Fig. 5. Frequency of colour along a line*

Where 1 is red, 2 is blue, 3 is yellow, and so on. He states simply that this represents “fractal rhythm”, but frustratingly fails to elaborate on just how this should be.

Perhaps less quantitative, but nevertheless worthy of consideration is evidence of a widening of similarity of scale in *Broadway Boogie Woogie*; the lines now contain an arrangement of coloured oblongs in the same way that the canvas contains an arrangement of oblongs. It would be overstating the case that the increased complexity of *Broadway Boogie Woogie* shows similar structure within the painting itself over many orders of scale, it's simply not true. But if one allows for the extension of space beyond the canvas, through the wall works in the studio and into the space of the building and then the street grid of New York, then the notional orders of scale mount up.



**Fig 6.** Scales beyond the canvas showing similarity (studio, building, street grid, state)

While Mondrian and Pollock were both intent on expressing the underlying universality of nature through their work, both Shearer and Taylor argue that Pollock came closer (albeit intuitively) than Mondrian to achieving this. Shearer goes as far as to argue that:

In view of what we now know from the new fractal model, what was discerned by Mondrian as nature's most fundamental principle—the right angle in its vertical position—now reads as Euclidean and

outdated, having very little to do with nature's universal laws.  
(Shearer, 1992: 149)

Pollock can be shown to have intuitively stumbled across fractal geometry, but do we conclude that Mondrian missed it, at best having intuitively found “unnatural” fractals? Or do we see the scintillation of colour in *Broadway Boogie Woogie* as at least the beginnings of such a discovery? In a sense, it matters less whether one can detect true natural fractal geometry within *Boogie Woogie*, as much as seeing how Mondrian was unconsciously feeling his way towards it. In his own way I suggest that he had begun the journey towards the drip paintings of Jackson Pollock, and in so doing was achieving the same result, namely a simple representation of nature in painting form.

Harmonization can be taken to mean allowing two opposites to coexist in balance to their mutual benefit. Often it is possible to find true intermediate positions which are not either of the two extremes; for example there are many sexualities between “male” and “female”. In this way fractal geometry seems to occupy a position somewhere between order and chaos, a kind of half-(or fractional)-way house

### **The Liberation of New York**

It is now time to think about some specific influences behind Mondrian's final developments. In this matter, the use of the title “*Broadway Boogie-Woogie*” is highly significant. Mondrian rarely gave his paintings titles other than “*Composition*”, deliberately to distance his work from the mimetic. With his move from the stresses of war-torn Europe to the optimism of New York, and with this painting in particular, we see finally the recognition that subject matter need not be excluded entirely. The grid arrangement of streets in New York, the lines and oblongs of windows and buildings all seem to be much more closely aligned to Mondrian's vision of a pure world than the curvilinear Art Nouveau of Paris. He had moved from the home of the arabesque to a world in which his own symbol,

the straight line, prevailed. In particular this was an opportunity to harmonize better the space of the canvas, the space of the studio and the space of the outside world without breaking his rules. This is a theme explored in some depth by Schufreider.

Champa dedicates a chapter of his book to *Broadway Boogie Woogie* claiming it as “the uncontested masterpiece” of his New York period (Champa, 1985: 127). He observes that unlike most of Mondrian’s other paintings, this one has received much critical review. It, together with *Victory Boogie Woogie*, stands out from the rest of his *oeuvre*. (Ironically In spite of Mondrian’s efforts to avoid the particular, one of his most admired and talked about paintings is exactly that!).

Champa proposes that the discovery of coloured cloth tape in New York was perhaps one of the more important catalysts for Mondrian’s innovation in his last works; it allowed him to work directly and immediately with coloured lines, speeding up his experimentation from weeks to hours. Champa writes

the particular form of dynamic equilibrium used in *Broadway Boogie Woogie* differs from earlier forms in that alternative and opposed readings of the whole pictorial structure of the painting replace the internal balances and oppositions that are the rule in earlier works. Simultaneous openness and flatness are everywhere and at once optically present... (Champa, 1985: 138)

Not only was New York the quintessential modern city, but it had the added attraction of being in the land of jazz. The rhythmic oscillations of primary colours along the lines of *Broadway Boogie Woogie* are temptingly close to simulating a musical rhythm, and although Mondrian never played jazz records while painting<sup>9</sup>, modern dancing was a major part of his non-painting life. In the

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<sup>9</sup> Mondrian never listened to music while painting, because he was afraid people would think that it represented music, “and that it is not, it is free from music” (Cooper, 2001: 35)

introduction to Mondrian's essay on *Jazz and Neo-plastic* Holzman reports a revealing earlier comment on the prospect of the Dutch government banning the Charleston dance. Mondrian said in an interview:

Yes, danced nervously, as it is by Europeans, it often appears hysterical. But with the Negroes, a Josephine Baker, for instance, it is an innate, brilliantly controlled style....The dancers are always so far from each other, and have to work so strenuously, there is no time for amorous thought (Holzman, 1987: 217)

His observation of "brilliant control" in the context of hysteria points clearly to his fundamental life position, which in turn parallels the whole issue of order beneath chaos in nature that his art attempts to reconcile.

Perhaps equally interesting is the reference to the "amorous". The rigorously controlled painting style of mature neo-plastic fairly reeks of repressed or controlled passion. Only in his *Boogie-Woogie* works is there any real sign of rebellion and overt expression. This is not the place to probe into Mondrian's sexual practices or repression of them, but perhaps to leave the subject with a quote from Mondrian, on being pressed by another artist to visit a brothel in Paris: "every drop of semen spent is a masterpiece lost" (Collins, 1995)

Mondrian tried to link the rhythm of jazz with the rhythm he was aiming to produce in his paintings

Jazz being free of musical conventions now realizes an almost pure rhythm, thanks to its greater intensity of sound and to its oppositions. Its rhythm already gives the illusion of being "open" unhampered by form. But on the other hand Neo-Plasticism actually shows rhythm free of form: as universal rhythm. (Holzman, 1987: 218)

Unique to boogie woogie is the way that the base rhythm line is brought up in volume to match the improvisation line; the normal musical hierarchy is replaced by an unprivileged balance, much as Mondrian would try to achieve in his paintings. Mondrian's views on jazz shifted in New York when he heard boogie woogie. For him this was a major advance in that there was now no melody line to be emphasised over any other part of the music. In 1938, Mondrian was dancing with Lee Krasner at a party in New York, when the music switched from boogie woogie to jazz, whereupon he was heard to announce: "let's sit down. I hear melody" (Bois, 1995:77)

## **Conclusion**

The New York environment, ironically a very particular location, encouraged Mondrian to harmonize more effectively a number of binary oppositions. Modern dance and in particular the boogie-woogie catalysed a most dramatic transition in Piet Mondrian's painting. It eased him away from the rigidity of the black-lined Euclidean grid underscored by the Calvinistic constraints of his childhood towards a looser and more chaotic use of colour. The patches of colour sidestepped many of the preconceptions associated with black or monochromatic lines, and introduced a rhythmic character within them. The optical linking of colour across the canvas accentuated the dynamic equilibrium by inviting the eye to move obliquely and curvilinearly as well as vertically and horizontally.

Most of Mondrian's work evolved in small steps, but *Broadway Boogie Woogie* was a revolutionary step forward, and it had its problems. These included the optical mixing of otherwise pure colour and the return of the dreaded figure-ground dichotomy.

Perhaps most provocatively in this essay I suggest that Mondrian's last two paintings showed some evidence of fractal geometry within the canvas, albeit

unlike that associated with nature. Instead he intuitively stumbled onto a fractal geometry of man-made space spanning ordered brushstroke and modernist city.

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