The Æsthetic of precision in virtual design
What are the implications of precision in the use of computers in the modelling of architecture and interior design?

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Abstract

It is suspected in design education, that the use of computer representations of design, especially 3D modelling, tends to limit design outcomes in some ways while at the same time appearing to offer greater opportunities to explore new ideas in others. Virtual space in design becomes a province of isolation, often noted for its limited view of design. Precision itself is a *style* of argument (rhetoric) for design, conventionally accepted in such pictures as working drawings. The precision of the drawing itself is denied in order to make way for precision in the concept. The return of the æsthetic of representation as an æsthetic of precision is the result of the denial of pleasure of drawing. It is a drive to find pleasure in the concept itself through precision of representation as measurement of the design as material; an æsthetic of precision.

The computer model, which simulates the design within its simulated Cartesian space, becomes the most precise place for the design to exist. Within an æsthetic of precision, this becomes the best, most complete version of the design. It is therefore a conceptual precision modelled rather than a perceptual precision, that is seen. The phrase "more real than real" expresses the character of computer modelling and image making, as it is regarded within the æsthetic of precision. The computer produces a representation of intelligence that is offered as a reality. For design this means that the material purposes of, for examples the physical body, lose their intensity. Thus a new formal virtuosity is possible.

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Introduction

It is suspected in design education, that the use of computer representations of design, especially 3D modelling, tends to limit design outcomes in some ways while at the same time appearing to offer greater opportunities to explore new ideas in others. Anecdotally, this seems to be shown in student work where computers have been used, especially for modelling architecture and interior design in three "dimensions". Virtual space in design becomes a province of isolation, often noted for its limited view of design. Work produced using virtual modelling seems to all have the same "look". This effect is usually thought to be caused by the complexity of the software and/or the prefigured nature of the default actions possible in that software. It seems that the limitations of the equipment are appearing in the work that it represents.

This argument is of the same kind that says that architecture is rectilinear because drafting equipment makes orthographic drawing easier than curvilinear or free-form drawing, especially in terms of measurement.

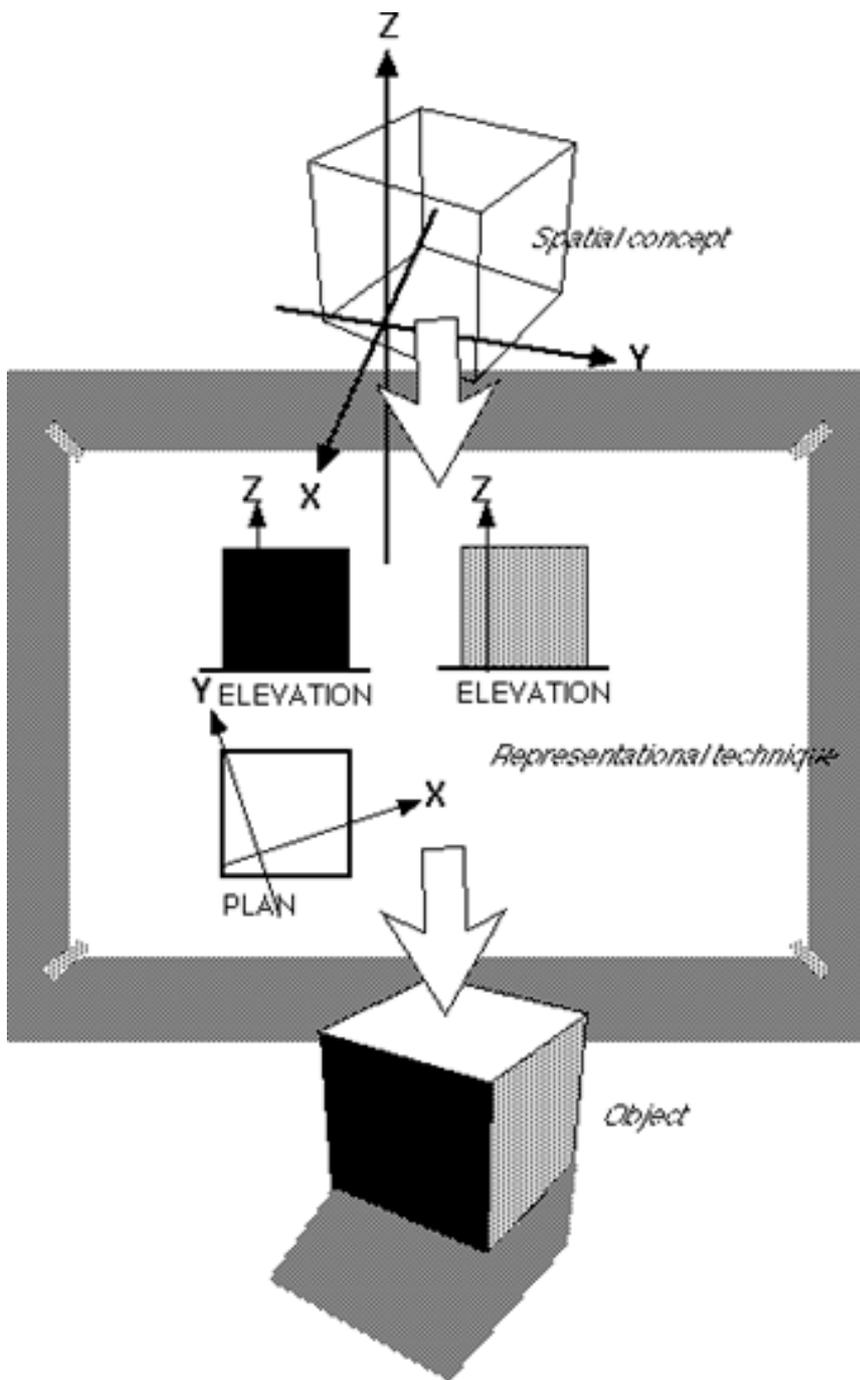The argument presented visually, goes like this:

Figure 1: Diagram of the argument that presentation influences design. (Image prepared by the author)

The shape that is expedient in the representation process is that which tends to occur in the final design.

This of course is a generalisation. There have been many buildings before computers, that have curves that are notoriously difficult to draw. For example, the Sydney Opera House, conceived using models cut from spherical sections (the orange slices). These buildings have been extraordinarily complex to draw and can often only be determined from models. Even the invention

of curves such as the Bezier curve, have not made the process of manual representation that much easier.

Computing has made, it seems, complex building shapes involving, for example curves, far more accessible, even easy to represent, in a way that is measurable and build-able. It has made the three dimensional visualisation of buildings as two dimensional images, as in free-hand perspective sketching, unnecessary. Computing it seems, has made the measurement of almost any shape possible in a fast, precise and reliable way.

The computer though, is the expression of a Cartesian spatial concept. This concept is that space is a measurable void, defined according to dimensional axes. The definition of locations is made using "Vectors" which are locations according to the dimensional axes. These Vectors are made in relation to an "Origin', that in the computer has become completely freed from any actual locality. Vectors are now place-able at any point within the conceptual space. Combinations of vectors have made objects which have the same freedom of location, including freedom from gravity. Has, in the virtual world of the computer, Cartesian space been fully realised? Is this an abstracted Euclidean dream. If so what does this mean? Is this the completion of a cycle that predestines a profound change in thinking, especially in design?

It is not intended here to examine the historical relationship between the technology of representation and the production of built work with which it was associated. That the rectilinearity of buildings and the technology of the drawing board *are* part of the flux of Cartesian thought is not questioned here. The measurement of the degree of precision within which computers can work and the extent to which that degree is asserted as measurement of quantity itself, while having bearing on the discussion is not the primary focus either. Neither is it the purpose here to examine examples of rendered images from computing models in an attempt to find the golden egg within the dissected corpse of a digital goose. The influence of communication technology on design is *assumed*. What then, is the focus of the paper? The primary focus is the consequences of a specific form of representation

If computing is to become the primary mode of communication, what would this mean for the fleshy human constellation? The question of precision is used as a focus for this issue because precision is the argument by which the computer is gaining or has gained ubiquity in design.

The æsthetic of representation

The æsthetic of representation has been the target of certain branches of philosophy of art during the 20th century. This æsthetic had been the mainstay of western philosophising about art since the Greeks. The articulation of art as "picture" in which an opposition between representation and abstraction has been made throughout western philosophy from Aristotle but only really became fully determined during the European Enlightenment. Perhaps Immanuel Kant has, in his *Critique of Judgement* [1], best summed up the European position for the æsthetic of representation and indeed the universality of beauty as taste (*sensus communis*) [2]. Conversely, the self criticality of modernism, in which the "æsthetic life" becomes pride in one's self conscious dignification of humanity through "dis-interested" curiosity, is best expressed in 1863 in the French poet and writer, Charles Baudelaire's, "Painter of Modern Life". [3]

In Kant's model, representation equals presentation of the visual sensation of a natural thing in a simulation. The recipient of the sense of a thing is a passive (disinterested) recipient if the sense of the thing is to be sensed clearly. Thus representation and by inference, art, can only mimic nature and thus cannot add to knowledge, unlike science. Art is "fine" because it is *judged* and science is true because it is *reasoned*. [4]

The business of representation then, is to, through careful observer neutrality, make more and more precise judgements about the sense of things, thus bringing about better art. Thus "fine art", as Kant calls it, pursues precision. In this model beauty is in the sense of the thing and is the same beauty that is found in nature and is not arguable as such, merely sensible,

We may generally call beauty (whether natural or artistic) the *expression* of æsthetic ideas. [5]

Taste on the other hand, is arguable due to it being about judgement. The following from Kant explains his position,

"As we have frequently shown, there is an essential difference between what we like when we merely judge it and what gratifies us (ie, what we like in sensation). The second is something that, unlike the first, we cannot require of everyone". [6]

It is this second thing, taste, that is "argued" for in representation, which perhaps explains it tendency to the grammatical, from which, for example, perspective gains its "truth". As Hubert Damische writes in *The Origins of Perspective*,

Its [perspective's] function as a paradigm extends much further, or deeper, providing painters with a network of indexes that constitutes—I posit this hypothesis again—the equivalent of an expressive apparatus of sentence structure, ... [7]

For design, it is what Damische calls *Perspectiva Artificialis* [8], that is to say the constructed simulation of three dimensional image of a concept in which the design ideas are "expressed", as Kant would put, takes place, but also in which precision is the means by which design is more accurately *argued* for through that precision. Precision itself has become a *style* of argument (rhetoric) for design, conventionally [9] accepted in such pictures as working drawings.

In the drive for accuracy in the prediction of the flow of reality, precision has become an abstracted goal in itself. In drawing and especially drafting, it has developed according to its own æsthetic *of* precision, in which an special form of reductive abstraction has found a home.

Drawing for the purposes of construction exhibits a certain style readily adopted by designers but with a certain reservation; that it is drafting for draftsmen [10] and is within the tradition of the drawing office. The style of lettering of hand drafting for example, is *de rigeur* for architects, who seem to be perfectly willing to use the style even though in most other aspects of their practice they assert originality and independence. It is as if the style of hand lettering is a badge or sign of that independent tradition, a paradox to be sure, when it is put like that.

> enclosing space. The grid of squares not only allows us to plot points in three-dimensional space but also regulates the perspective width, height, and depth of objects and guides the drawing of lines in proper perspective.

Figure 2: Ching, D. K. and Juroszek, S. P., *Design Drawing*, Wiley and Sons, NY (1998: 250).

The ubiquity of an architectural style hand-lettering is evidence of a universality of thought, if one regards handwriting as a significant form.

The precision with which the system of hand lettering of orthographic and in particular, "working drawings", is adhered to fiercely by architects and is now also used by interior designers is now far beyond the needs of communication of material meaning. The establishment of computers in drawing offices has left the *tradition* of hand lettering largely unaffected. It has though, meant that it is no longer the *practice* among draftsmen.

The beauty of drawing has been found, for the draftsman in the precision achieved in and for the drawing itself. The traditions of the design for decorative art and craft show the same need to satisfy an æsthetic idea in the representation of design. The result of the "craft" approach is that there is a desire for æsthetic unity in the representation and the product itself. The craft of representing is the expression of the truth of the design as an aesthetic experience. The shading and linework are an attempt to represent the actual physical presence of the object.
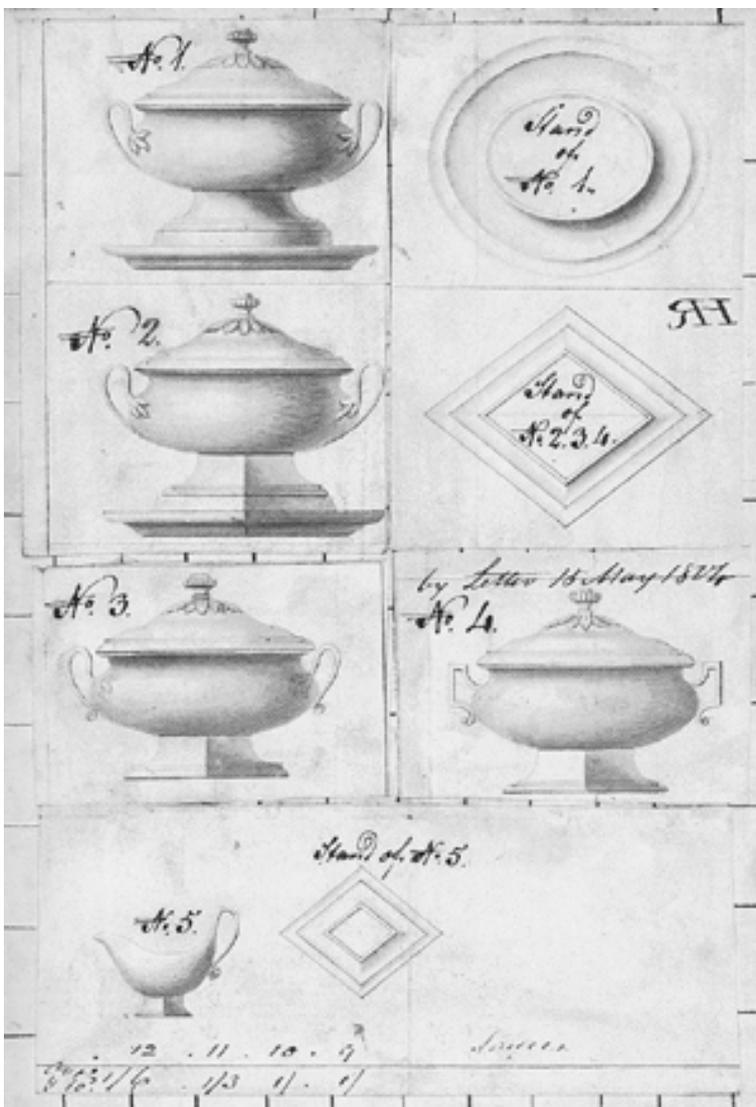

Figure 3: The Aesthetic unity of craft and design in representation, from Cliff, S, (date unknown), *The English Archive of Design and Decoration*, Thames and Hudson, London, p91. The drawing is from the "set of albums in the collection of the Victoria & Albert Museum, London, believed to be the production records of Messrs. Hartley Greens & Co....1802." (p64).

The precision of the representation works *within* the same tradition of design, not against it or in an attempt to re-figure the tradition in an avant-guardist way, in this approach. Colour for example is described by "actual" colours, for example gouache or water colour, rather than the written notes one finds in the representations of early 20th century design. The extension of this text representation is the use of colour systems where colours are defined according to codes, as are supplied by paint manufacturers. The precision of the drawing itself is denied in order to make way for precision in the concept.
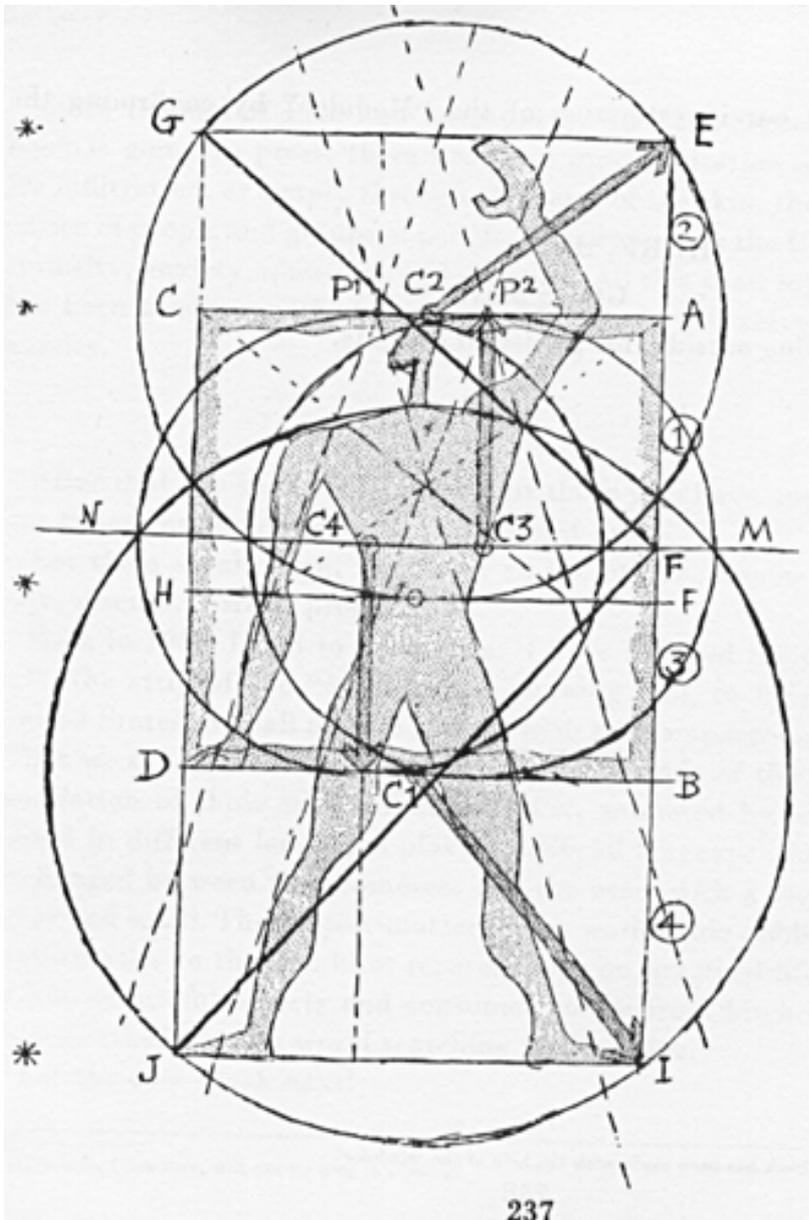

Figure 4: "The Modulor", from Le Corbusier, *The Modulor*, Faber, (1963: 237, fig. 100)

It is in the early 20th century industrialised modernism that the æsthetic of representation changes from unity to divergence (from the design), according to the "break with the past" that is usually characterised as modern or avant-garde. This break is shown by a break with the craft aesthetic in which there is a denial of the pleasure in the making of the image.
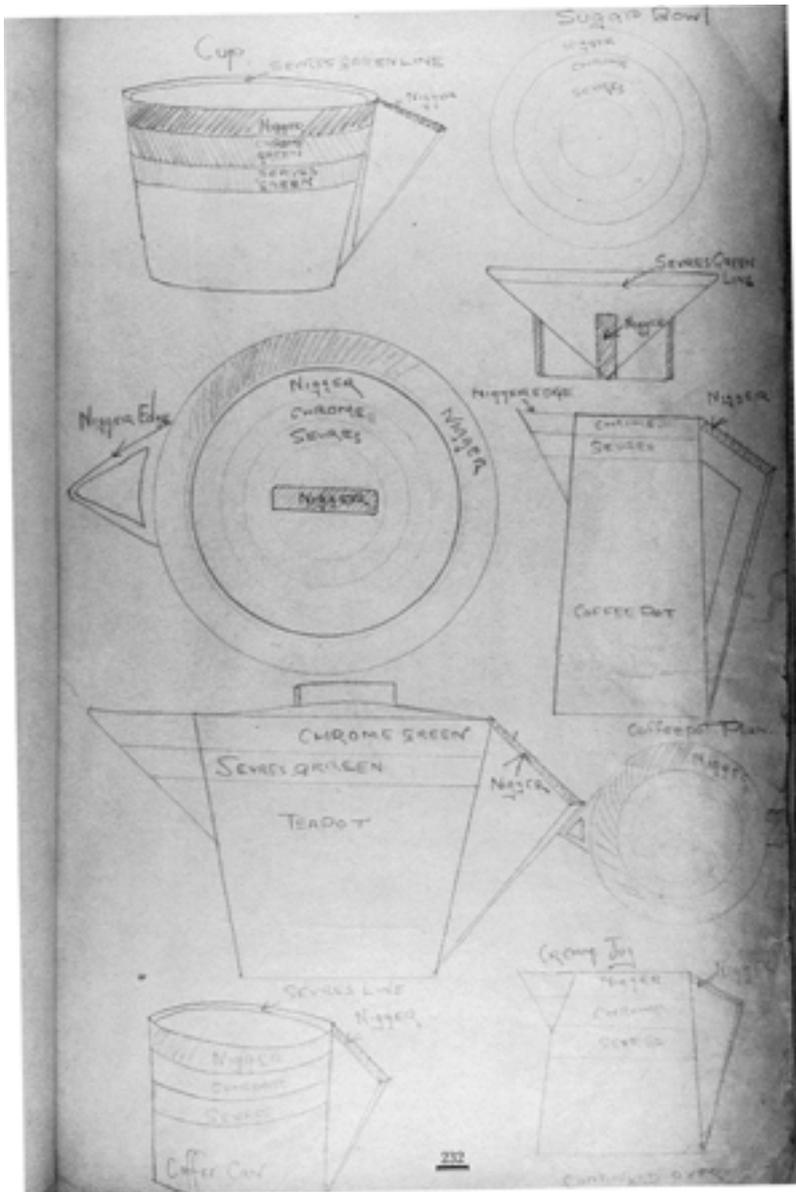
Figure 5: Conceptual unity at expense of perceptual unity. From Cliff, S, (date unknown), *The English Archive of Design and Decoration*, Thames and Hudson, London, p232. The drawing is dated approximately in the late 1920's by designer Clarice Cliff (1899-1972).

The suppression of pleasure in the representation of design, along the lines of all repression results in a *return*, in some other form.

In Baudelaire's essay the "painter" becomes proud of the curiosity that he self-consciously directs toward his fellow man and thus reduces his life to an æsthetic image of himself as a good person, interested in humanity. The universality of beauty becomes a means of attaching value to oneself. Instead of entering *communitas*, communitas becomes the object of observation and thence possession for the disinterested subject. It seems as though the adoption of purely æsthetic sensibility deprives one of a motive for morality and ethics. In this kind of approach, art becomes a process of representing without engagement or commitment and a purely private pleasure in the consideration of the public object. Precision becomes a matter of mechanical reproduction for the purposes of pleasure, thus opening the way for objective industrialised design and a determination for the æsthetic of precision within the concept. LeCorbusier's design concepts would not have gained ground without the dissociation of the public self from æsthetic pleasure; one was not allowed to say the design was ugly if it could be shown to have an arguable concept.

The Bauhaus and illusion

For the Bauhaus [11], *representation*, according to the Kantian tradition, was found to be a bad thing. It was thought to be "Illusion". The intriguing thing about this is how representation of the natural world became associated with illusion and how illusion became a kind of 19th century decadence, rejected by the remaking elite of early traumatised 20th century Europe.

The concept of "illusion" as a thing to be avoided, was elevated in the Bauhaus, perhaps a legacy of or a relation to Russian Constructivism through the arrival there of Laslo Moholoy-Nage [12]. Representation, especially in colour, was the means by which illusion found a home. It was the Kantian "Genius" of production that the Bauhaus was pursuing rather than the mimicry that representation implied. It was the objects that could stand alone as beautiful, not due to what they might represent they were after. As Kant wrote:
"Judging beautiful objects to be such requires *taste*; but fine art itself, ie, *production* of such objects, requires *genius"*. [13]

In the drive to assert a distinct way of being through industrialisation, the Cartesian subject-object binary model was stripped of its ambiguity. Two dimensions were to be only two dimensions and three were only to be three.

The Genius was to be a machine for designing. "Everyone is equal before the machine" said Moholy-Nage [14]. Percept and Concept [15] became entirely separate entities within the opaque Formalism of the second Bauhaus, thus marginalising the work and ideas of Kandinsky and others. The insistence on positivistic materialism resulted in the relegation of spiritualism to an occult, "spiritualistic" function, not associated with the "real world", but with the 19th century mysticism, mediums and seances. Paradoxically, it seems, it was the formulation of concepts as "real", material things, as percepts that was the main interest of the Bauhaus. Moholy-Nage was determined to assert the "surface", the thing as a truth in itself, no depth in painting and one meaning for all things; the material meaning. It was the assertion of a concept over perception itself, all under what Walter Gropius called the opaque formalist "Great wing of architecture" [16].

And so it is the concept of form itself that replaces the percept in this idea. It is in this context that the pleasure of representation is regarded as deviant, even criminal in some of the more shrill declamations from De Stijl theorists at the time:

"We have given colour its rightful place in architecture and we assert that painting separated from the architectonic construction *has no right to exist"*. [my italics] [17]

In many of the drawings from the Bauhaus, there is a certain self-conscious incompetence in representation, despite the æsthetic of the design. The "Engineer's Æsthetic" [18] seems to involve the loss of drawing skills as if these are the mark of the flesh; a flesh that must be eschewed in the drive to be like a machine, or at least a part of it.

Drawings intended as the pattern or "direction" from which reality is given its "reality", have developed according to this machine-like denial of incarnation. It has become an *æsthetic* of denial, in which the pleasure returns under the conditions of materialism; *measurement* . From measurement comes the elevation of the value of precision; the orthographic projection is the most valued image in this æsthetic because it tells no dimensional lies, it is perfectly flat and conforms to the physicality of the object itself through its *scale*.

Orthographic drawing has thus developed its own need for precision apart from that required to satisfy the processes of manufacturing and construction. The æsthetic of this kind of drawing has its own philosophical orientation apart from what it may be representing in design. This must have a bearing on the perception and reception the design itself.

In summary, the return of the æsthetic of representation as an æsthetic of precision is the result of the denial of pleasure of drawing. It is a drive to find pleasure in the concept itself through precision of representation as measurement of the design as material; an æsthetic of precision.

This being the case, what the consequences of the æsthetic of precision are when computing takes that æsthetic to a new level, a new extreme?

Precision and the computer

The computer has enabled the manifestation of an æsthetic of precision in its most complete form yet, especially in the creation of "photo-rendered" images made from electronic models and the precise measurement of those models. The precision though, is also extended into the calculation of the means by which the design will be made; quantities and processes. The measurement of the concept only possible in the orthographic projections (plans, sections and so on) is now possible in the *perspective* drawing itself. Measurement is now possible of lighting models, sun and shadow charts, colours, scale, textures quantities, assembly, manufacture and even maintenance and usage of design of all kinds, within the perspective image through the electronic simulation of Cartesian space. [19]

It is the satisfaction of the need to *see* the concept *as quantity*, that the computer gains its power. The visualisation of a concept called a "design", as an *image*, means that the design is not actually entering the negotiated world in which the senses are brought into focus by the gathering of a self into a body, but rather the concept is made *visible* only, as an image of its post negotiated form. And yet this is measurable and therefore a form of truth! In this form, it conceptually needs *no body*, only an electronic simulation! This though, in its form as truth, is only possible when one is prepared to believe that the visible alone is "real".

Design is made in the computer from which drawing projections are measured, from which measurements of all kinds are made. The computer model, which simulates the design within its simulated Cartesian space, becomes the most precise place for the design to exist. Within an æsthetic of precision, this becomes the best, most complete version of the design.

For most of us though this is not the case; we need to imagine that we can touch, smell, hear *as well* as see the thing for it to really *be* a thing. When sound is added to an image, as in the cinema, the difference between hearing and sight gives us a negotiation with to bring a body and ourselves into focus and so make a "thing" and a "self" just that bit more real. As Merleau-Ponty writes in his last book, *The Visible and the Invisible*:

"...my synergic body [...] assembles into a cluster the "consciousnesses" adherent to its hands, to its eyes, by an operation that is in relation to them lateral, transversal;...that it is sustained, subtended, by the prereflective and preobjective unity of my body. This means that while each monocular vision, each touching with the sole hand has its visible, its tactile, each is bound to every other vision, to every other touch; it is bound in such a way as to make with them the experience of one sole body before one sole world..." [20]

An idea, the Real, is made from the negotiation between what Merleau-Ponty calls the "five notes" and the "family of sensibles we call lights." [21]

Virtual reality offers a completed visible reality, one that precludes the body of the observer. The touch of virtual reality is solely the fingers on the keyboard or the hand on the "mouse", that has a distant and strained relationship with sight, not like a body at all. This is of course why virtual images remain unreal, no matter how realistically imitative they become. The negotiation is already done and the body is not required, at least that is how it seems. The computer offers the appearance of pre-negotiation but in fact it offers a monocular vision presented to each eye related to a touch of the keyboard as a form of body-world. Its argument within the process of negotiation need take not account of the flesh, thus allowing precision in a more achievable setting.

To make a very precise visible image is therefore to assert a visible truth very precisely without the body, a truth that relies on that electronic digitisation of precision for its true-ness (not the eye and the ruler, even). It is therefore a conceptual precision modelled rather than a perceptual precision, that is seen. Even in the most limited tolerances of industrialised manufacture (the extended or supplemented body), are exceeded in precision by the modelling possible in the computer.

Within the computer a complete simulation of the "real" is now possible, at least for buildings, that goes well beyond naturalistic representation. The phrase "more real than real" expresses the character of computer modelling and image making, as it is regarded within the æsthetic of precision.

This "Super-reality" is taken as a more precise version of the truth of design than the final made object, exactly *because* it is more precise. Computer simulations satisfy a *conceptual* need that has been present in design work from its inception; that need is to make *visible* the concept itself. The character or identity of that concept is part of that need. It is *precision* that is the central character of the need for conceptual expression in computing. This need for precision is an end in itself in this. It is the end towards which the philosophy of subject-object metaphysics has made its way through science.

Æsthetic precision is pure expression through *representation* , of the pure thought of the concept; the establishment of *Res Cogitans* [22] as *natural*. It eliminates percepts from which concepts are constituted [23] through the simple belief that one has all the information within the concept itself, or at least its representation, modelled in the computer.

The mind is separated from the body as a form of perfection, but perfection as a (re)presentation of perfection as a concept. Thus precision is the end of the body as a reality. The way is open for fantasies of disembodiment and dislocation; the body becomes an object that can be discarded and replaced with the more perfect machine. The identification of the body as a person though, is a twist of the proverbial Deleuzian rhizomic web. It is both of the web and yet a knot within it. The body is a *self* while simultaneously it is of a species, while it is matter, and chemistry, and genetics, and race, and a nationality and so on. The self exists also as a point of focus within which linguistic acts drag being into matter, giving things their thingness; their "Dasein", their being-ness. Thought is the circumscription of events within the given language of the senses, that focuses being. The body is a product of thought finding its self in perception. The body then, is thought.

If precision is denying the body, it is cutting off the means of thought from the mind. To make it work it must replace the body with a "thinking" machine; the computer. The computer though, only produces the representation of, or a sieve-like *image* of thinking, with electronic bytes separated out into their relative sizes and shapes according to the requirements of the digital grid. Thought is then

replaced with the *image of thought* just as action is replaced with the image of action on television. The computer produces a representation of intelligence that is offered as a reality.

Is this the image of the thought-body replacing the perceived body?

The image of thought, because it is a reflective state rather than an entered embodied state carries an agenda of dislocation. It is thus through computed precision, as an ideal, given representation in the machine, that humanity will be excluded from its own perception and thus its own designs, its own body. It is only in the mass manufactured precisely designed industrial objects of hygiene that can approach the precision of the electronic machine, that will still be open to humanity as a body; the tooth brush. Their reality will seem strange, like the images of alien space craft seem strange in science fiction. Thus there is no room in the computer for a fleshy percept. In order to exist within precision, a self comes in which the machine *is* the flesh.

The feeling of everyday becomes a feeling of the machine. The hard surfaces of the senses become unreal. The self-world formed as a negotiation between the senses becomes less "real". The modern strangeness that Louis A Sass compares to schizophrenia in *Madness and Modernism, Insanity in the Light of Modern Art, Literature and Thought*, [24] becomes the everyday state for those in virtual space. In virtual space that is valued for its precision, this strangeness of the sensory percept will be more extreme, making the virtual world seem safer, more complete, more real. In this context design tends to be less related to the fleshy functions of the body; movement, scale, enclosure, surface texture, sound and shifts to the virtually conceptual; form without significance, contour without texture, dimension without scale. All this was possible without the precision of the computer, which designers, especially architects are first to assert. The architects Frank Gehry and Renzo Piano have both asserted that their complex and curly recent work has relied on the physical model. In Piano's case it is the material of model making from which the formal ideas come. In the case of Gehry, it is the imagined material relationship with form that is emphasised, [25]. In all cases though, it is the precision of the virtual model that enables the building of the work.
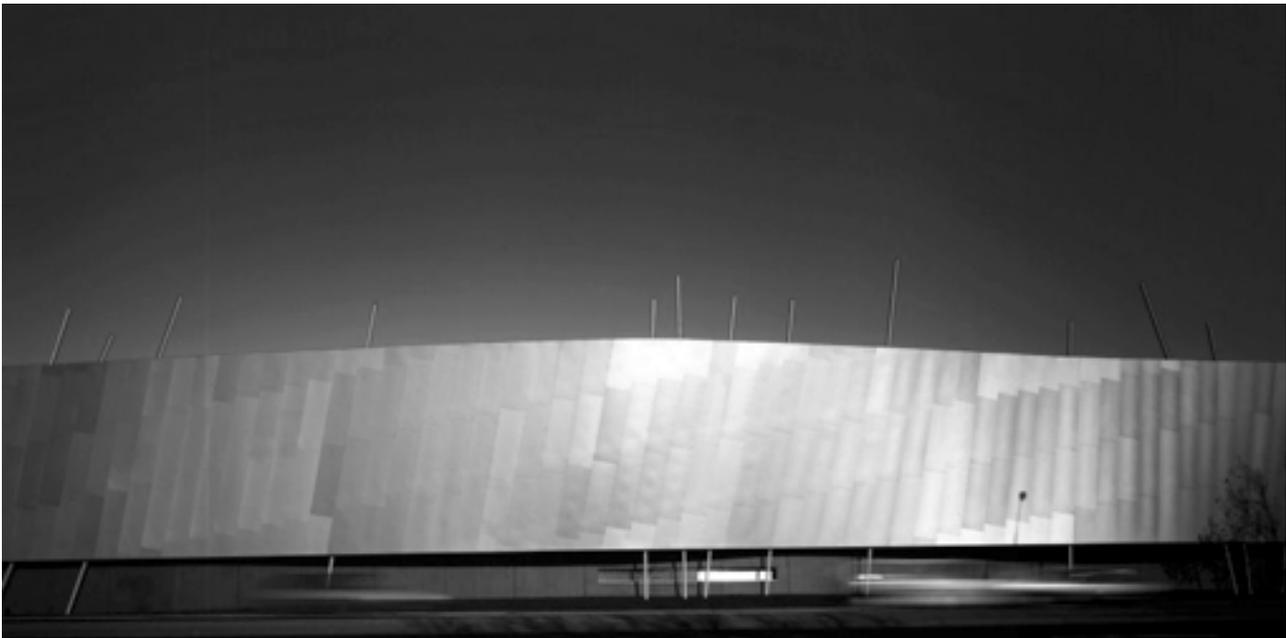

Figure 6: Denton Corker Marshall, Art and Design Building, Melbourne Australia, 2000, from DCM Website: http://www.dcm-group.com/Web/DCM_Folio_A.htm, 2001

So it seems that design, especially architecture is about to enter a new phase of virtual virtuosity. The qualities of electronic space will be made visible through its application to and measurement of the materials of architectural design. The following text from Renzo Piano can perhaps be understood as the beginning of that time:

"In Padre Pio's church, stone will be used not just for the paving and roofing, but as a structural material as well: the main span of over fifty metres will perhaps be the longest supporting arch ever built out of stone. This is not an attempt to get into the records books; it is simply desire to find out what can be done with stone today, almost a thousand years after the Gothic cathedrals were built. *Technical virtuosity is not an end itself, but meets the needs of a precise formal choice.* [my italics] The church at San Giovanni Rotondo springs out of the stone of the mountainside. Walls, parvis, supporting arches, and covering of the roof will all be made of stone. We have deliberately insisted on a single material as the expressive key to the design" [26].

His single material is coincidentally, one which can be fully modelled electronically. Renzo Piano also writes:

"I want to stress another point: a good building is not just beautiful, it is also good. A modern building today must be sustainable from every point of view, human, technological, energetic and economic". [27]
Sustainability, as Piano indicates, is a quality that should be measured accurately within each of the categories he describes. This is now possible thanks to electronic modelling, it seems. The return of pleasure through the æsthetic of precision tends to place the design more completely in virtual space. The design tends to be more suited to virtual space than the sphere of matter. Designs, in this context are becoming less concerned with enclosure and more concerned with abstract form or what might be called opaque virtual formalism. Issues of space become de-scaled and disembodied. Measurement though, makes them more "buildable" in the real world, the realm of "trades" and "materials", but an imperfect world in which the design is less fully manifest than in the computer. Bilbao Guggenheim for example looks alien, de-scaled, as if it were more properly within a computer, even the materials seem alien, as expensive, perfect in conception, representation but tedious in manufacture.

The theoretical work of Peter Eisenman can be seen as proto-precise in that its theoretical intent described in text with drawn images can be more fully and completely understood in computer modelling. In the final images of this presentation, space becomes an abstraction so purely represented, that it is impossible to build, despite being perfectly measured and imitated, which, it seems to me, suggests that architecture is on a cusp between the perfection of Kantian representation and a rediscovery of the fleshy constellation of architecture.

The following images from diagram diaries are drawn in a conceptual space perfectly suited to the technology of the computer.
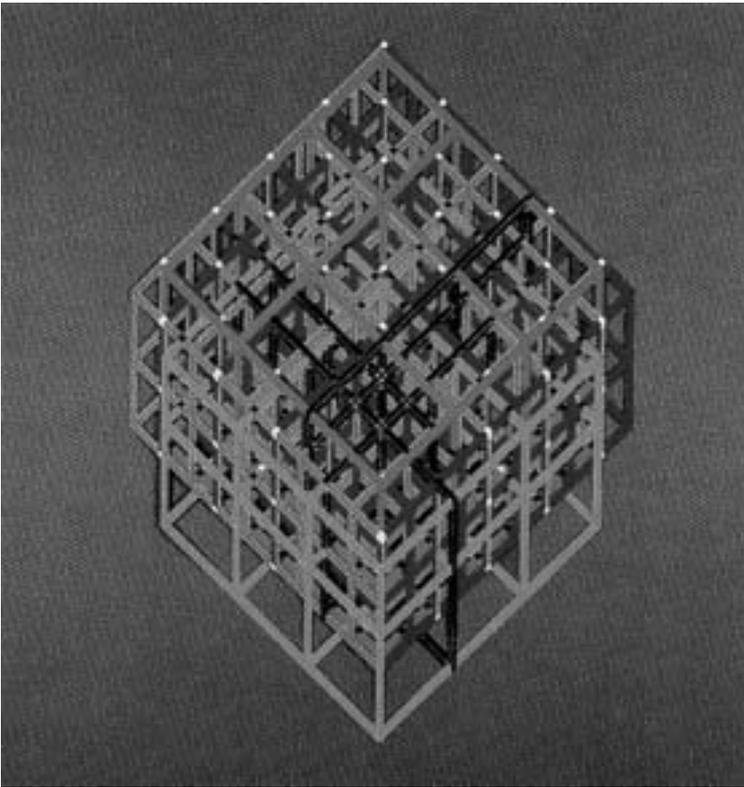
Figure 7: Eisenman, P, 1999,"Inversion Slippage, House VI", in *Diagram Diaries,* Thames and Hudson, p50
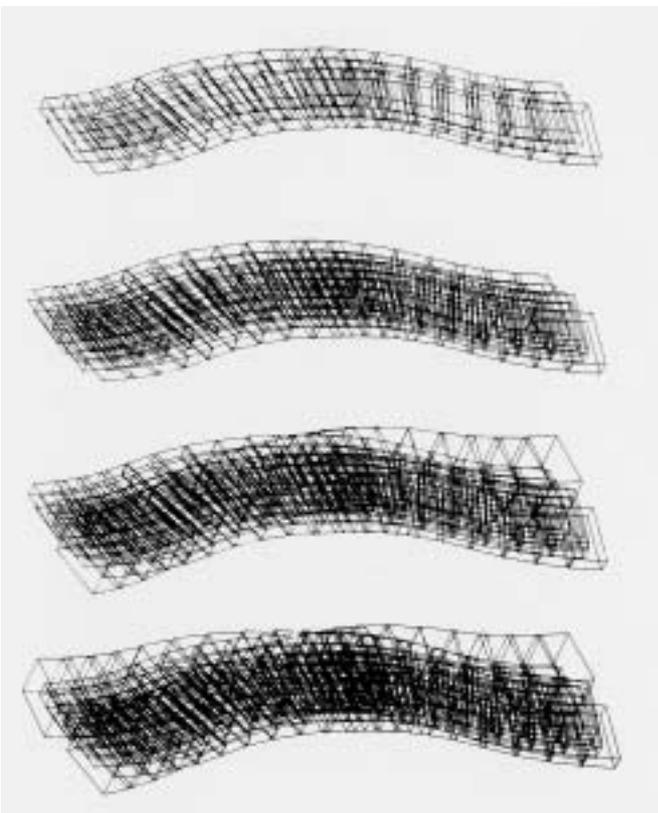

Figure 8: Eisenman, P, 1999, "Shifting Repetition, Aronoff Centre", in *Diagram Diaries,* Thames and Hudson, p50
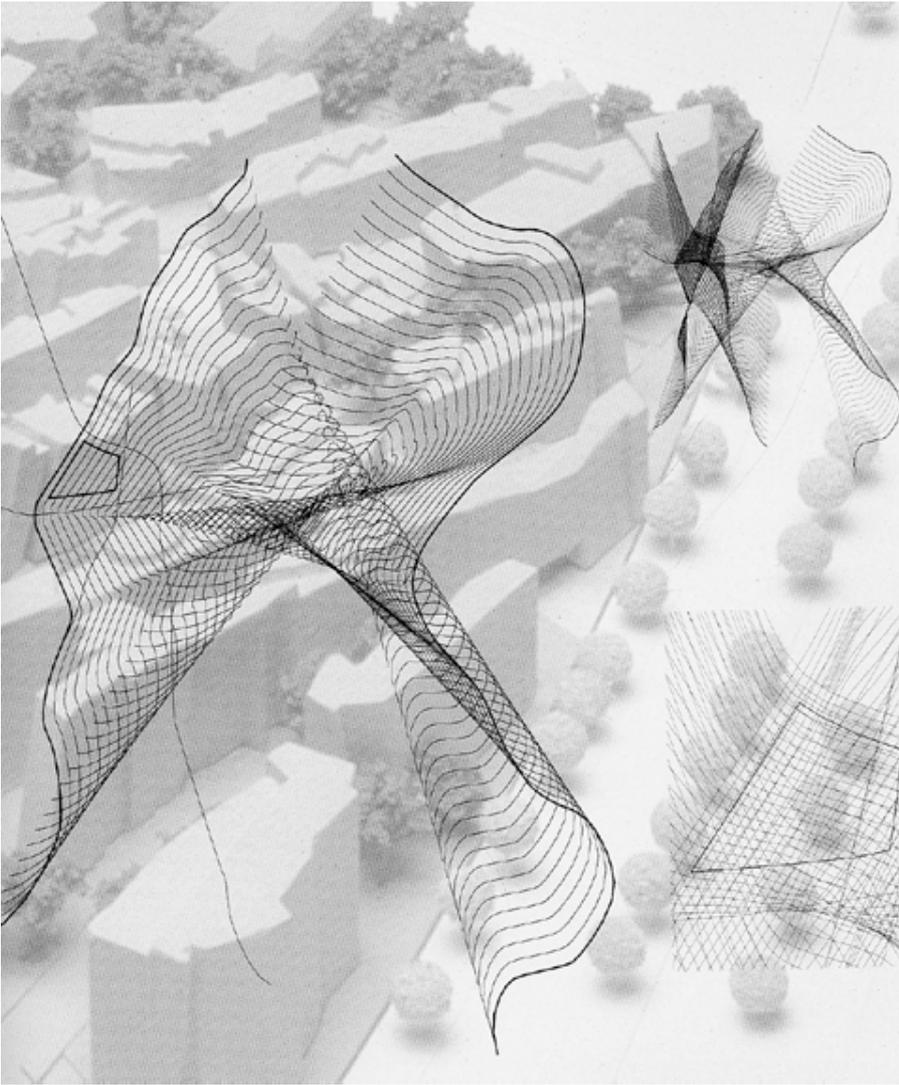
Figure 9: Eisenman, P, 1999, "Klingelhöfer-Dreieck, 1995", in *Diagram Diaries,* Thames and Hudson, p151

The fact that Eisenman has presented them as either "plans" or orthographic "3D" drawings such as axonometric projections suggests a rhetoric of precision more accessible within the highly sophisticated virtual projections of the computer. To illustrate this, a number of computer models have been made of Eisenman concepts, from the drawings shown in *Diagram Diaries.*

Thus the æsthetic of precision has found its way out of the exclusion from representation of design forced by modernism, and into the computer where it is enabling and yet also determining or defining a new virtuosity. It is this new virtuosity that now appears, as is seen in the examples of The Bilbao Guggenheim and in many other projects already built, both profoundly developed and yet exclusive. Design is tending further away from the multiplicity of locale to a new level of the universality of the machine within which the claim of the an individual can be argued as univocal truth.
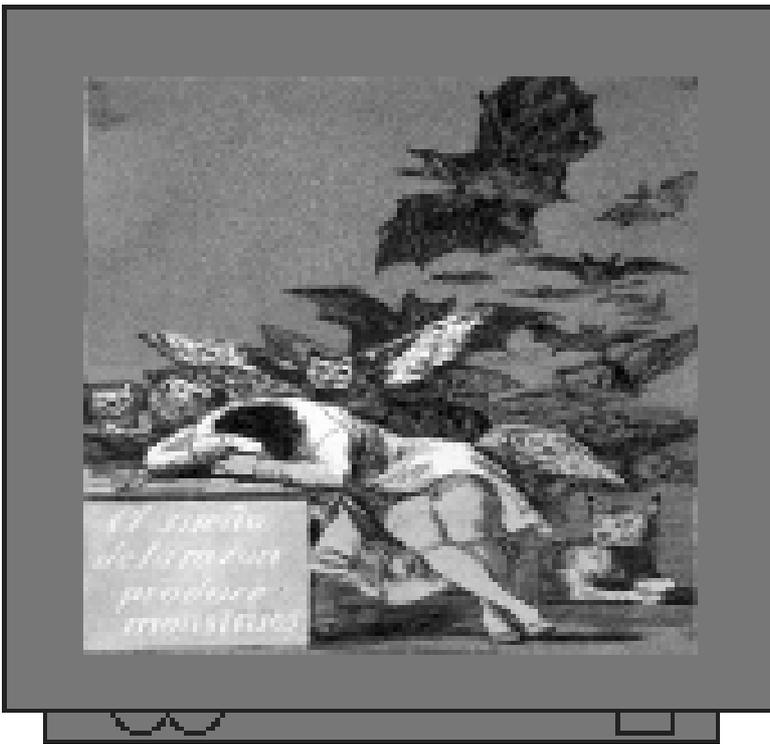
Fig 10: "The Sleep of Reason Produces Monsters". The title of an etching by Francisco Goya in his book "Caprices", as shown in Collings, M, 1999, *This is Modern Art*, Weidenfield and Nicolson, p80

References

[1] Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge

[2] Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge, p160. The text is "shared" to which the translator adds "[by all of us]" but this is not necessarily clear. It could be that Kant meant that "sharing" is a characteristic by which taste becomes taste. Thus it doesn't matter how many share it, just that it is shared.

[3] Charles Baudelaire, "The Painter of Modern Life", in Cahoone, Lawrence (Ed), 1996, *From Modernism to Postmodernism, an Anthology,* Blackwell, p136-p144

[4] See Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge, p172 "On Fine Art"

[5] Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge, p189 "On the Division of the Fine Arts"

[6]Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge, p201 "Comment"

[7] Damisch, Hubert (John Goodman, Trans), 1994, *The Origin of Perspective,* MIT Press, p25

[8] Damisch, Hubert (John Goodman, Trans), 1994, *The Origin of Perspective,* MIT Press, p23

[9] "Convention" is used here in its full sense in which a con-vention is formed through the use of linguistic practices in order that the linguistic practice can be confirmed.

[10] While the term "draftsman" is clearly gender specific, it is used here to indicate the male stereotyping of the practice of drafting, as it remains today. This stereotyping is primarily in architectural, building design and engineering practice while female stereotyping has been common in some government institutions in Australia, especially in the area of two dimensional or graphic design.

[11] The effect that Bauhaus had on western design is well documented and so will not be argued here.

[12] Whitford, Frank, 1995, *Bauhaus,* Thames and Hudson, ch 12, "Towards a New Unity: Moholy-Nagy and Albers"

[13] Kant, Immanuel, 1987 (first published 1790) (trans, Pluhar, Werner S), *Critique of Judgement*, Hackett Publishing Company, Indianapolis Cambridge, p 311 "On the Relation of Genius to Taste"

[14] Whitford, Frank, 1995, *Bauhaus,* Thames and Hudson, ch 12, "Towards a New Unity: Moholy-Nagy and Albers", p128

[15] Even the most cursory reading of René Descartes' work shows the over simplification this makes.

[16] "Work Council for Art"; *Under the wing of a great architecture* (1919, Berlin), quoted in Conrads, U. (Ed), Bullock, M., (Trans), 1964, *Programmes and Manifestoes in 20th Century Architecture*, Lund Humphries, London, p 44

[17] De Stijl", Manifesto V: — _ + = R4, 1923, as quoted in Conrads, U. (Ed), Bullock, M., (Trans), *Programmes and Manifestoes in 20th Century Architecture*, Lund Humphries, London, 1964, p 66. While De Stijl split with the Bauhaus because it seemed unproductive and so an enemy of the state, they remained of one kind when it came to the principles of abstract architectonic formalism.

[18] Le Corbusier, "Towards a new Architecture: guiding principles", 1920, as quoted in Conrads, U. (Ed), Bullock, M., (Trans)1964, *Programmes and Manifestoes in 20th Century Architecture*, Lund Humphries, London, p 59

[19] Perspective drawing in computing is actually the use of electronic modelling from which "projections" are made.

[20] Merleau-Ponty, Maurice, 2000 (©1968 in English, 1964 in French), *The Visible and the Invisible*, Northwestern University Press, p141-p142, This text was in draft form at Merleau-Ponty's death with the end section remaining incomplete. It contains explorations that indicate an abrupt divergence from his other works such as *The Primacy of Perception* and his main text, *The Phenomenology of Perception.*

[21] Merleau-Ponty, Maurice, 2000 (©1968 in English, 1964 in French), *The Visible and the Invisible*, Northwestern University Press, p151

[22] I would like to point out that while the separation Res Cogitans-Res extensa is usually attributed to René Descartes, in his section titled "An Explanation of The Human Mind or the Rational Soul. Which Explains What It Is And What It May Be" from Descartes, René, (Translated by Desmond M. Clarke), 1998, *Meditations and Other Metaphysical Writings,* Penguin London, p 185-186, Descartes says "Those are mistaken, therefore, that claim that we [he] necessarily conceive [s] of the human mind, clearly and distinctly, as really distinct from the body" His idea is that there is a realm of mind and a realm of body "intertwined" as Merleau-Ponty would say in "The Chiasm" from Merleau-Ponty, Maurice , 2000, *The Visible and the Invisible*, Northwestern University Press, (©1968 in English, 1964 in French), p130-p155

[23] The Deleuzian analysis of Spinoza, from which this idea comes, is found in Deleuze' lectures series of 1978 at Vincennes, four lectures on Spinoza. These lectures were found at the following web address in march 2002 (are currently off the internet):
Deleuze: Sommaire
I - Sur Spinoza: Vincennes - Deleuze: 24/01/1978: Version Espagnole; English Version. ...
Version
Espagnole. Vincennes - Deleuze: 24/03/1981: Version Espagnole.
www.webdeleuze.com/spinoza.html - 4k - Cached - Similar pages
Deleuze: Sommaire
III - Sur Leibniz (2ème série): Vincennes- St Denis
- Deleuze: 16/12/86: Version Espagnole. Vincennes ...
www.webdeleuze.com/leibniz2.html - 3k - Cached - Similar pages

[24] Sass, Louis A, *Madness and Modernism, Insanity in the Light of Modern Art, Literature and Thought*, Harvard University Press, 1992

[25] No doubt both architects would be horrified to be summed up in such a way. Architects are profoundly resistant to other people explaining their work. Perhaps this is due to the avant-garde proprietorship that they feel for it. This can at times seem like pure contrariness.

[26] http://www.rpwf.org/works/works_9020.htm, 8.4.2002

[27] http://www.rpwf.org/works/works_9020.htm, 8.4.2002

Websites:

Denton Corker Marshall, (Architects and Designs), DCM Website: http://www.dcm-group.com/Web/DCM_Folio_A.htm, 2001

Deleuze: Sommaire
I - Sur Spinoza: Vincennes - Deleuze: 24/01/1978: Version Espagnole; English Version. ...
Version
Espagnole. Vincennes - Deleuze: 24/03/1981: Version Espagnole.
www.webdeleuze.com/spinoza.html

Deleuze: Sommaire
III - Sur Leibniz (2ème série): Vincennes- St Denis
- Deleuze: 16/12/86: Version Espagnole. Vincennes ...
www.webdeleuze.com/leibniz2.html