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Towards a Unified Theory of Beauty[1]

Jennifer McMahon

1. Introduction

The Pythagorean tradition dominates the understanding of beauty up until the end of the 18th Century. According to this tradition, the experience of beauty is stimulated by certain relations perceived to be between an object/construct's elements. As such, the object of the experience of beauty is indeterminate: it has neither a determinate perceptual analogue (one cannot simply identify beauty as you can a straight line or a particular shape) nor a determinate concept (there are no necessary and sufficient conditions for beauty at the semantic level). By the 13th Century in the West, the pleasure experienced in beauty is characterized as disinterested. Yet, on the basis that all cultural manifestations of the pythagorean theory of beauty recognize that judgments of beauty are genuine judgments, we would want to say that judgments of beauty are lawful. In addition, from ancient times, up until after Kant, philosophers of beauty within this tradition recognize two kinds of beauty: a universal, unchanging beauty coexisting with a relative, dynamic beauty.[2] These two kinds of beauty and the tensions discussed above, are reconciled and dissolved respectively, according to the metaphysical/religious commitments of the particular author. As yet, however, these features of beauty have not been reconciled within a physicalist worldview. This is what I set out to do.

The aim of this paper, then, is to outline a way of thinking about beauty which resolves these apparent contradictions. An explanatory hypothesis for beauty is developed, which draws upon recent developments in cognitive science[3]. A theory of perception needs to satisfy certain conditions

in order to explain the features of beauty in such a way that they are complementary rather than dichotomous. This paper begins by uncovering the nature of these conditions, and considering whether contemporary theories of perception satisfy them. Finally, an outline of a new way of thinking about beauty emerges whose relevance for understanding contemporary art is then examined. But first, a brief history of beauty is in order.

2. The Pythagorean Tradition of Beauty[4].

the rays of the noumenal world filtering through the phenomenal world

In the above quote, Robert Zimmerman[5] is referring to the aesthetic experience according to Immanuel Kant. The noumenal world is the world as it objectively is, independent of our perceptions of it: the world as we can never know it. The phenomenal world is the world as it appears to us: we can only know the world through the constraints imposed by our perceptual apparatus. However, according to Zimmerman's interpretation of Kant, the aesthetic experience allows us to glimpse something of the noumenal world. This idea reflects something of the 'otherworldly' feel to the aesthetic experience: the 'hard to characterize' quality of beauty.

This peculiar quality of our experience of beauty is reflected in the explanations given of beauty throughout history. For example, in ancient times, beauty was interpreted as connecting the perceiver with a consciousness or a state of being which existed beyond the material world. According to Plato, beauty, though instantiated in objects, was a transcendent entity. The phenomenology of beauty highlights that paradox of beauty which the hypothesis presented in this paper attempts to explain. The paradox, as evidenced in Plato's Phaedrus, is that the perception of beauty, though apparently the perception of a property of particular objects, at the same time

feels as though it is a recognition of some greater truth about the nature of things: a truth already known a priori by the perceiver.

In medieval times, the perception of beauty was understood to facilitate self-transcendence; a feeling of being in harmony with others or something beyond the self.[6] It was believed that the experience of beauty connected the individual to the divine. However, against this universal subjective response to beauty, was the objective nature of beauty. Just as, according to Plato (and Aristotle[7]), beauty was manifested in objects as an organic unity, according to Thomas Aquinas, beauty manifested itself in objects and events as an order and harmony.[8] Kant's construal of the problem of beauty as involving an antinomy caused by the apparent subjectivity and universality of beauty had previously emerged in the work of ancient and medieval thinkers. That is, it was recognized that the experience of beauty involved a certain type of response and a certain type of stimulus. The stimulus evoked a perceptual harmony and order because of the constitution of its parts. By the medieval period, the response to this perceptual harmony and order was already being characterized as a pure and disinterested pleasure.[9]

The true nature of beauty was a central philosophical question in eighteenth century philosophy. The ideas on the subject developed at this time, are most notably formulated by David Hume[10] , and Kant[11]. During this period, the experience of beauty is ultimately associated with a particular kind of perceptual act of a particular type of object, usually an art object or an object of nature. However, Hume and Kant emphasize different aspects of the interaction between the perceiver and the object judged to be beautiful. According to Hume, the perception of beauty involves a certain response on the part of the perceiver which is conditional on the perceiver having a sense of beauty. However, his actual identification of beauty tends to direct us

towards searching the beautiful object for its defining characteristics. According to Hume:

> Beauty is such an order and constitution of parts as either by the primary constitution of our nature, by custom, or by caprice is fitted to give a pleasure and satisfaction to the soul.[12]

Kant, on the other hand, directs our attention to reasoning what perceptual/cognitive conditions must exist in the perceiver in order to explain the way in which we experience beauty. For example, he reasoned that the basis of a disinterested pleasure must be universal as no personal grounds come into it. This led into his speculation regarding the origins of the universality of judgments of beauty. According to Kant, the judgment of beauty can be thought of as universal because the basis of the experience of beauty is perceptual form and this basis is intersubjective. So Kant provides a lawful basis to judgments of beauty without providing necessary and sufficient conditions for beauty at the semantic level. The antinomy that Kant sets out to solve is represented by Mary Mothersill[13] as a matter of needing to reconcile two apparently contradictory theses. These are (*first thesis*) that there are no principles of beauty (no properties in the object which are logically necessary and sufficient to an object being beautiful); and (*second thesis*) that there are genuine judgments of beauty. I call Mothersill's first thesis, the ineffability thesis; and her second thesis, the lawful thesis. Mothersill suggests at one point that if principles of beauty were neurophysiological or psychological conditions[14] then there would be grounds for genuine judgments of beauty which do not translate into properties in the object which are logically necessary and sufficient to an object being judged beautiful. She writes:

> aesthetic theory ... requires definitions and principles ...[however] there is no reason to suppose that the principles must be principles of taste; and the supposition that the definitions of art or beauty that

> philosophers have advanced are designed to promulgate principles of taste appears simply to be false[15]

3. Three Conditions of a Unified Theory of Beauty

If we understand principles of beauty, not as properties in the object, but as principles which underlie the perceptual processes employed in the perception of certain objects, then there would be principles of beauty which do not lock us into the idea that there are stateable sufficient conditions for beauty. That is, we could think of beauty as a relational property existing in the object by virtue of there being certain processes involved in the perceptual apparatus of the perceiver, of which she becomes aware in the course of perceiving beautiful objects. In this way, the elements within Kant's antinomy as well as the two theses identified by Mothersill would be reconciled. A judgment of beauty could be understood to be both universal and subjective based on the fact that the experience of beauty is an awareness of species-specific perceptual processes or principles. If an awareness of these principles were pleasurable in themselves, it would be a disinterested pleasure, quite distinct from pleasure of the sensuous or pleasure experienced in the good. While there would be no principles which translate into necessary or sufficient conditions for beauty at the semantic level, there would still be grounds for genuine judgments of beauty. Hence beauty's universality (lawfulness) and subjectivity (ineffability) would be complementary features of beauty.

The title of this paper suggests that I will be providing an outline or approach to a theory of beauty which will encompass all manifestations of beauty. The problem emerges, however, that if we explain beauty according to an awareness of certain perceptual principles, the possibility of mathematical, scientific, moral and intellectual beauty would seem to be precluded. In order to accommodate these kinds of beauty within the explanation provided for perceptual beauty, perceptual principles would need

to figure in, either analogously or in some parallel way, higher level judgments of a cognitive kind.

In order to accommodate the idea of beauty emerging here, then, a perceptual theory would need to (i) *include a stage of perceptual processing that was responsible for the construction of perceptual form, which we could validly distinguish from other operations and processes;* (ii) *posit principles or assumptions about the physical world embedded in the system which constrained the construction of perceptual form and were accessible to consciousness; and (iii) include the possibility that perceptual principles could figure in, either analogously or in some parallel way, higher level judgments of a cognitive kind.*

3.1 The First Condition of a unified theory of beauty; perceptual form

In this paper I use vision as my model of perception for two reasons. First, there is more research carried out on vision than on other perceptual modules and secondly, the visual arts are my favoured art form for discussion. I could add a third reason, that vision is paradigmatic of how perception operates but that would demand the kind of argument and evidence for which there is no room here. For the purposes of this paper, let us assume that the auditory and haptic perceptual modules both involve analogous form-making principles to vision[16].

The problem of vision is to work out how our cognitive systems can arrive at a reliable interpretation of the world from the varying light intensities that hit the retina (the equivalent problem in sound is how we hear word-sounds instead of letter-sounds or whole sounds like passages of music rather than just the elemental auditory vibrations which make up the sound). The mathematician and neuroscientist David Marr, in an attempt to solve this problem for vision, envisaged the visual system as an ascending hierarchy of representations, which were data driven and largely bottom up. Put very

simply, Marr's idea was that the perceptual system groups pixels of light of similar intensity and close proximity into angles, lines, shapes. With the help of constraints imposed by inbuilt assumptions about how the world is, these elements are further decoded and transformed into representations which provide information about shapes/forms and their position within space. Because of the speed at which we extract this information, and the automatic and mandatory nature of this process, Marr reasoned that this transformation from the retinocentric image into a 3D image must operate, by and large, independently of processes which draw upon explicit higher level knowledge (semantic and naming). This assumption is supported by evidence that humans can perceive shapes in depth without prior knowledge (Bela Julesz stereograms[17]). Furthermore, Marr drew upon the work of the psychologists E. K.Warrington and P. Rabin[18] whose study of patients with parietal lesions found that it was possible to recover the 3D shape of an object which projected an uncharacteristic angle to the viewer even when the patient had no accessible semantic or naming knowledge of the object.[19] Marr concluded that vision can solve the problem of building a description of shape and positions of objects from images, independently of object recognition[20]. Further evidence for a separation of structural, semantic and naming stages is provided by neuropsychological studies conducted more recently by Glyn Humphreys et al. This evidence supports the idea that vision is made up of a number of small modules, 'at least in so far as the processing of independent specifiable image properties is concerned (e.g. depth and motion being separated from the processing of form).'[21] Colour is significant at this level in providing information about tone (much as Cezanne relied on the juxtapositioning of certain colours to create the illusion of form; the colours in his paintings are not characteristically chosen for their sensuous properties). Clearly distinguishing form-construction as a distinct perceptual process,

which is a reasonably safe assumption to make, is the first stage in establishing the possibility of perceptual principles of form-construction.

3.2 Principles of perceptual form: the second condition.

What is important is whether there can rightly be understood to be principles of form embedded in the visual system's operations of which we can become aware in a limited kind of way (in the sense that we cannot be aware of their source phenomenologically and we cannot accurately match them with language schemata). This would explain how these principles can be universal-subjective; and lawful-ineffable. It would also explain why the object of an experience of beauty is indeterminate both perceptually and conceptually, given that the principles of which we become aware in an experience of beauty, would constitute a part of the architecture of the mind. How an awareness of these principles of form could produce an experience of beauty would need to be explored at the neurological level; for example, by examining the connections between areas of the brain responsible for form-construction and the emotional centres, specifically pleasure-centres of the brain. However, for the purposes of this paper, it is enough to consider how our way of thinking about beauty might be changed, if the explanatory hypothesis presented in this paper were true.

Representational theories of vision based on the belief that the output of visual processing is underdetermined in the proximal stimulus usually envisage visual processing as stimulus driven but supplemented with innate assumptions. Marr posited that, embedded in the visual system, there are rules or laws about the way forms are spatially constructed. These are the rules that transform the retinocentric image into an object-centred image in such a way that just one mental description of an object is constructed (during the course of perception) regardless of its projected angle to the viewer. Marr emphasized that these laws would be about the real world, understood as such

presumably because they would have evolved as a result of survival pressures on the organism; for example, assumptions like 'all objects are rigid' or 'there are relatively few connected surfaces'[22]. Such assumptions would prompt a certain transformation over another, and would be automatic, mandatory and usually unconscious. Furthermore, as Frances Egan points out:

> It is important to note that these assumptions are not assumed to be explicitly represented in the visual system. The assumptions are incorporated in the mechanism only in the following sense - the mechanism operates in such a way that if the assumptions are true of the subject's normal environment it will succeed in recovering information about the environment from information in the image.[23]

Marr observes that an occluding contour (like the boundary of a silhouette) can provide enough information for us to recover the geometry of a whole shape in generalized form. In an example of reverse engineering, Marr reasons that three assumptions must be built into the process for this to be possible. These are: (i) each point on the contour generator projects to a different point on the contour; (ii) nearby points on the contour arise from nearby points on the contour generator; and (iii) the contour generator lies wholly in a single plane. The cognitive psychologist Ilona Roth points out that the inbuilt assumptions that Marr reasons must constrain the construction of perceptual form are in line with Gestalt principles[24]. The Gestalt principles are: the law of proximity, the law of similarity, the law of good continuity, the law of closure. These laws are manifestations of the more basic Law of Pragnanz; 'Of several geometrically possible organizations, that one will actually occur which possesses the best, simplest and most stable shape'. According to Roth, however, Gestalt psychologists did not have the means to ascertain how these principles might actually work. It has been left to experimental and computational investigations to reinterpret perceptual grouping as a stage that operates on simpler elements such as edge segments, initially extracted from the retinal image, and to posit the kind of constraints

the system would need to impose in order to achieve the transformation. Irvin Rock, in a move which in hindsight can be interpreted as a bridge between Gestalt principles and Marr's assumptions, points out that it is not the simplest and most stable shape that the system prefers, but the simplest and most stable description underlying that shape, which in principle could result in the most complicated shape being extracted, or constructed, from the retinocentric image[25]. According to Marr's model, shape descriptions are constructed of cylinders, principal axes (which provide information about elongation and symmetry), and volumetric primitives which are constructed around the axes. The assumptions involved in selecting these elements from the image serve to make explicit the organization of the space occupied by an object and not just its visible surfaces[26]. Consider that a description of principal axes and volumetric primitives would not contain information about the object seen from only one angle (like the viewer-centred image) but would represent the three dimensional hierarchical decomposition of the object into segments.

More recently the psychologist Irving Biederman has developed the geon theory in which instead of Marr's orientational and volumetric primitives, there are twenty-four volumetric primitives[27]. These primitives, as with those posited by Marr, can be thought of as a kind of 'dialect of mentalese' according to the philosopher Stephen Pinker; a visual language in terms of which all objects are constructed and perceived[28]. However Pinker, drawing upon experiments he conducted with the psychologist Michael Tarr, concluded that shape analysis is more likely to be a combination of a number of different kinds of processes. The process might include detecting geons, or mental rotation or matching with templates or some combination of these. In addition Pinker and Tarr found that detecting dominant axes was a significant part of shape analysis (form construction)[29]. In any case, it is sufficient for my purposes that there is a perceptual process responsible for the construction of perceptual form which we can think of as being constrained by certain

inbuilt assumptions or principles. As the above discussion bears out, it is quite reasonable to assume this. The next task is to explore the possibility that these underlying principles can be consciously accessible.

To ascertain whether or not such principles could be accessible, we might first start with whether neural activity in the areas of the brain responsible for form construction is accessible to consciousness. Neuroscientists Francis Crick and Christoff Koch postulate that unless a visual area has a direct projection to the frontal cortex, 'the activities in that particular visual area will not enter visual awareness directly, because the activity of the frontal areas is needed to allow a person to report consciousness' They continue:

> 'All we are hypothesizing is that the activity in V1 [which provides the dominant visual input to higher visual areas] does not directly enter awareness. What does enter awareness, we believe, is some form of the neural activity in certain higher visual areas, because they project directly to prefrontal areas[30].

The process involved in constructing perceptual form is a high level visual process. Crich and Koch's research, then, suggests that some form of this activity can enter awareness. This is not to establish proof for my second condition but merely that the evidence emerging from neuroanatomical and psychophysical studies of vision at present does not contravene the possibility that the principles underlying the process of the construction of perceptual form are accessible to consciousness (a mental state which has neither a determinate concept nor a determinate perceptual analogue)[31] .

3.3 Perception and cognition: the third condition.

The third condition is the possibility that perceptual principles could figure in, either analogously or in some parallel way, higher level judgments of a cognitive kind. One way to envisage this as a possibility is to imagine that perceptual form can be constructed not only from bottom-up input into

perceptual modules but also from top-down input from cognitive systems into perceptual processes, even though we would not experience the resulting representation as perceptual form as such. In this way, not only the relation between sensory or perceptual aspects of objects, but also the relation between concepts could count towards an experience of beauty. An example of the kind of evidence needed in order to assume this can be found in the work of the cognitive psychologists Michael Posner and Marcus Raichle. They drew upon experiments conducted on people using Positron Emission Tomography. They found that a signal that has left the areas of the brain responsible for higher level perceptual processes can re-enter that area from centers responsible for higher level cognitive tasks.[32] That is, high level perceptual processes can operate on input that enters from cognitive centres of the brain rather than only on input that has entered through the specialized perceptual input channels. Another example is the work of the psychologists Deborah Chambers and Daniel Reisberg, the results of whose work support the notion that high-level perceptual processes are responsible for mental imagery, which is a kind of representation that can be involved in high level cognitive tasks.[33]. At this point then, we can speculate that intellectual beauty can be accommodated by an explanatory hypothesis of beauty in which the experience of beauty is constituted by an awareness of certain perceptual principles in the course of perceiving/apprehending certain objects/constructs.

4. Beauty and Art

4.1 Visual Art and Beauty

We can further speculate about the way in which the relevant perceptual principles, prompted by certain objective characteristics in the object, need to be employed in order to be brought to our attention. Perhaps certain relations in the object, in the course of being perceived, challenge or stretch the relevant perceptual principles in an unprecedented or non typical way. On the

other hand, the relation of the elements within some objects, such as natural forms (and certain artworks, for example, the sculptures of Constantin Brancusi, 1876-1957), might epitomize the perceptual principles. Perhaps when the principles are invoked in any way which is likely to draw our attention from straight-forward object recognition to the process of perception as a solution to a problem, then we are experiencing beauty. That is, when it is as if the very process of perception itself is experienced as a resolution of tensions, or a solution to the problem of constructing a coherent form from an array of primitives, then we experience beauty.

The contemporary Australian painter Jeffrey Smart[34] sets up the visual elements in such a way that our search for a visual resolution is always rewarded but not without some tension along the way. The fact that he uses everyday objects like street signs, road markings and trucks in his paintings to set up these purely visual symphonies does not dull the visual challenge; the solutions emerge from the relations between the visual elements (objects). The way the elements are arranged in his paintings give rise to one unified configuration. According to the vision-scientist Glyn Humphries, there is a difference between the processes and principles involved in observing 'within object relations' as compared to those exercised in perceiving 'between object relations'[35]. The former are such that when detected, the system perceives the elements so related as cohering within a discrete object rather then as elements of different objects. Perhaps a painter like Smart, contrives relations between objects in his paintings that mimic 'within object relations' and that is why the perceptual principles employed come to our attention, and cause a disinterested pleasure, even though we are not aware of the basis of this pleasure. 'Within object relations' are those that give rise to a unified whole. When a composition is set up to mimic this unity *between* representations of objects, this would count as an unusual employment of these principles, an

unusual solution to the problem of perception, and hence we become aware of the perception of the painting as a solution.

It might be objected, however, that while various cultures do seem to offer a universal experience of certain aesthetic constants, at the same time the various cultures can be said to have their own unique aesthetic. For example, we can look at African sculptures, Japanese tea ceremonies and Byzantine religious icons and while we can enjoy their perceptual beauty, we may not be able to experience their intellectual beauty in the way someone whose worldview was saturated by the outlook exemplified in these works could. If there were a constant perceptual kind of beauty and a dynamic intellectual component to the experience of beauty, the latter would explain the aspects of a culture's aesthetic which are inaccessible to the uninitiated.

My hunch is that purely perceptual beauty is caused by a particular relation between objective properties of the object and certain species-specific perceptual principles and as such can be understood to be universal. Perhaps, though, the kind of relations between perceptual elements which give rise to a unified whole can be experienced analogously between the elements of a conceptual construct. This kind of apprehension could vary considerably in complexity; from the notion of a balanced approach to what a particular culture understands as the necessary components of a good life to the experience of mathematical beauty. Intellectual beauty, from scientific beauty to moral beauty would demand a shared background of knowledge or a shared worldview.

An example of a visual art form which evokes a response to perceptual and intellectual beauty while certain of its culturally embedded intellectual connotations may well be largely inaccessible to Western minds, is Australian aboriginal art. While one unfamiliar with the particular aboriginal culture would not understand the work in the way a member of the particular

aboriginal group would, one could still respond to its perceptual form and certain aspects of its intellectual form. Imagine an art critic who has no knowledge of the traditional art and culture of the Australian Aboriginal. While she would not understand the work in the same way as a person from the relevant cultural group, not understanding the exact meanings, interpretations or value placed upon the work as a member of the group would, there is still a common level of experience of the work. The critic might, on studying, for example, the work of Emily Kame Kngwarreye (1910-1996) called 'Ntange Dreaming' 1989[36], notice fine, carefully spaced marks, lines and dots, which she might experience as sensitively balanced and counterbalanced throughout the work. Yet shifting her focus to the way that the various earth tones and white and black are juxtaposed, gives the impression of a fluctuation in relative weightings, which results in an ungraspable, unpredictable configuration of movements not only across the picture plane but backwards and forwards into the pictorial space. This configuration must confound the assumptions posed by Marr as somehow represented in the visual system that 'surfaces are continuous' and 'objects are solid'. Further prolonged contemplation of Kngwarreye's work can result in an involuntary shift in perception from moving dots to tonal groupings which result in the emergence of broadly defined shapes. But it is impossible to hold this configuration indefinitely. No sooner has this configuration appeared than it is lost again to an energetic array of exalted dots. Enough basic visual primitives (dots, edges, tones, textures) are provided to occupy our visual system in a search for form which is continually tantalized but never permanently satisfied. The configurations which we apprehend, from the slow throbbing movement of individual marks and dots across the picture plane to the virtual lines and shapes, which when configured bring a temporary stillness to the work; are constructed by our form-making principles as they search (normally unconsciously) for contours, and orientational and

volumetric primitives. The uninitiated critic, the Aboriginal artist and her cultural community can all agree at this level, because this level of perceptual interaction with the world is universal. What involves the intellect of a post-modern viewer is the dynamic nature of the configurations. The harmony and balance of the work seem tenuous and unstable: it is as if the painting's harmonies are revealed in real time but can be missed if the various possible configurations are not perceived. This is not the static balance of a High Renaissance painting, nor the delicate overtures in the direction of balance of a traditional Japanese landscape; rather it is a rhythmic, throbbing, dynamic balance which challenges more established aesthetic canons.

This is not to claim that all artefacts are made to serve the same purpose or evoke the same meanings; or even to claim that all people can overcome concerns extraneous to the experience of beauty. If one's mind-set is that art is for complementing Edwardian furnishings, traditional tribal art might appear an aberration, as it did for the middle classes first introduced to African art in the early 20th century. On the other hand, if you believe that the only art forms relevant to our age are installation and multi-media art, then traditional art forms will be perceived as aesthetically unrewarding. Another obstacle to aesthetic appreciation can be if an art object's message or perceived meaning arouses the viewer's anger or disgust to a significant degree. When this happens, it is unlikely that the viewer will be able to experience the work's perceptual beauty, because the attention will be arrested by the literal meaning of the work.

When the relations within an object in the course of being perceived, violate the normal operations of perceptual principles, perhaps by not providing a stimulus which can lead to the construction of a coherent form, then we might experience the object as ugly. However, some artworks designed to evade perceptual form construction can manage to elude ugliness.

Jackson Pollock's *Blue Poles* (1952) entrances the eye with its skeins of paint seemingly on the move across the picture plane, and to some extent into the pictorial space such are the varying tonal weights of the overlapping dribbles and splashes of colour. But it does not offer a solution to the construction of form; there is no resolution of spatial tensions. Instead, the work keeps us at the level of the purely sensuous; pleasurable in the same way as physical pleasures but not the same as the disinterested pleasure of the experience of beauty.

There are many extra-aesthetic reasons for various fashions. A theory of beauty need not cover all fashions, nor the way we enjoy all artworks for that matter, because there are many other factors in human experience that can inform and drive such preferences and activities. Maori tattoos and the elongated lips and necks of certain African tribes are associated with high status: this is partly why they are looked upon with approval by members of their communities. There are a number of speculations as to why such trends took off in the first place but they need not concern a theory of beauty.

It is possible for a work which arouses our response to beauty through its perceptual form, not to provide us with the phenomenologically more total beauty experience, which is a combination of relations emerging within and between its perceptual form and conceptual content. It may be that the work simply doesn't provide the opportunity for the latter, or it may be that the viewer does not share the same worldview or metaphysical/aesthetic canons as the artist, which would preclude her from experiencing its intellectual beauty. For example, Impressionism can be aligned with an increasingly secular, analytical worldview, newly forming within an increasingly atomistic analysis of experience. As contemporary aesthetics moves towards a more holistic worldview, Impressionism can appear naive or thwarted in its attempt to capture experience. Cubism has often, if somewhat flippantly, been understood as the artistic expression of relativity. It is probably better aligned

with quantum mechanics; a fracturing of the classic scientific deterministic worldview. While many art works demand both a perceptual and intellectual engagement (the relations in the intellectual construct paralleling the relations between the perceptual components), some artworks reward one kind of engagement rather than the other with an experience of beauty.

Intellectual constructs are beautiful when they are balanced, harmonious and unified, or achieve 'unity in variety' to take the Hutchesonian line, but our notions of what constitutes these qualities can and do change and develop. A voiding feature of intellectual beauty is unilluminating ideas[37], or ideas that are too general or obvious. What counts towards these voiding features will also change over time, within the individual's and the society's life. The point to be made here is that the fact that not all art evokes an experience of beauty is no more a threat to the possibility of beauty than the fact that not all mathematical and scientific theories evoke a response to beauty. The intellectual beauty component of art, and scientific, mathematical theories is dynamic; it may take time for the public, and often those more established in the particular field, to catch up[38]. Furthermore, the degree to which an artwork prompts you to respond intellectually to it rather than just perceptually, is the degree to which its beauty will be dynamic and relative, rather than constant and universal.

4.2 Other forms of Art, and Beauty

The outline of an explanation of beauty presented in this paper, assumes that beauty supervenes on the formal relations among and between the perceptual properties and/or the concepts of an object/construct. I have discussed the idea of form above in relation to visual art. What can we mean, however, when we talk about the aesthetic form of a poem, novel, a sonata or film?

Monroe Beardsley in his discussion of form in literature[39] discusses what he understands as all the possible elements which make up literary form.

He includes both the phonetic and semantic aspects. He divides these further into sound textures (details of sound changes, relations between sounds); sound structures (structures definable in terms of sound rather than meaning, e.g. the sonnet); meaning textures (meanings of certain words, phrases, sentences and paragraphs) and meaning structures (plot - sequence of events considered in the order in which they occurred rather than the order in which they are narrated which is what is known as the story). These categories can be further dissected and elaborated, and Beardsley does this, describing language forms such as qualities, diction, syntax, patterns and verbal designs.

Now for meaning structure, Beardsley makes further illuminating distinctions. The structure of a literary work according to Beardsley is the large-scale relationships within the work, the major connections[40]. He singles out logical, narrative and dramatic structures. Logical structures are made up of relationships connecting episodes; relationships that are evidential, consequential, definitive or deductive. Narrative structure refers to relationships within the plot - the number of episodes or sequences of episodes, the story lines or plots and sub-plots - the parallels or contrasts between them (for example, they may have a complex, scattered movement or a direct repetitive motion). Dramatic structure refers to regional qualities of movement - that is, the kinetic pattern, if you like, like the building and relaxation of tension - variations in the on-goingness of the work, its pace and momentum. He further analyses the dramatic structure into episodes or sections of discourse with either an Introductory Quality (the preliminaries, the setting up of a scene), Exhibition Quality (the body of the piece) and the Conclusion Quality (the winding up). Further structures he discusses are perspectival structures (relationship between speaker and his situation) and developmental structures (where the situation or the speaker's attitude changes in some way).

An important part of the form of literature are the relations set up between the dominant ideas or, in some cases, the images created and the subordinate ideas/images - the themes which emerge and the relation between these - developments, changes, contrasts, parallels. What Beardsley refers to as 'the kinetic curve' of a literary work may largely be mapped as developments to, and from, scenes of greater or less climax: 'the reversal, the confrontation, the revelation, the showdown, the death'[41]. The pattern of episodes created may be sequential, logical: a smooth continuous rise and fall of tension where the sequence is in some way expected or looked forward to. Or it may have a more disjointed feel when possible interpretations are invited and are multifarious, giving a more unexpected, difficult to grasp overall structure to the work. In some works the unity sought will be continually frustrated: but the work will arouse notions of unity even if only by drawing the reader's attention to the unity expected but not revealed. What this unity refers to is the aesthetic form of literature. The aesthetic form is constructed over time. Consider the time it takes to read a literary work; the gaps between the reading times and so on. Grasping the form occurs with the apprehension of the plot/s, the apprehension of the intricacies and complexities of the various elements of structure. If we re-engage with the story on returning to it after a break, we also set up the elements of structure. How well we apprehend the form will depend on the quality of our engagement with the work. Certain contemporary literary styles only intimate the structure, leaving it to the reader to fill in the details of interpretation which the reader normally does in a trial and error way until a unity of meaning is revealed. Literary works can challenge aesthetic canons or stabilize emerging ones through habituation just as other art forms and new scientific theories can.

Absolute music presents an example of an art form which can be experienced either as perceptual beauty, or as a combination of both perceptual and intellectual beauty. Certain philosophers of music imply that

there is only one way to validly experience the beauty of music and that is perceptually. According to Peter Kivy, the musical work's structure is its essential characteristic. Various renditions or interpretations of the work can still be judged to be that work according to the degree that the same relative sounds within the performance are achieved[42]. Others insist that both form and content can contribute to music's beauty but then proceed to conflate content with form. Eduard Hanslick believed that the content of music was tonally moving forms[43]. The explanation of structure in literary works described by Beardsley, the various kinds of passages and how they are related, particularly his notions of introductory, exhibition and conclusive quality, and his idea of dominant and subordinate themes, can all be applied analogously to musical structure. Some theorists discuss this form in anthropomorphic terminology such as: tension, climax, release. In any case, the idea that beauty is to be found in the aesthetic form of the work is easily applied to music. At the psychological level, however, to treat musical beauty as having a perceptual component in the same way as visual beauty, requires that the auditory perceptual module is set up in an analogous way to vision. The philosopher Diana Raffman treats auditory processing as such when developing an explanation for musical nuance ineffability[44].

Probably the most difficult art form to think of in terms of aesthetic form is performance; for example, theatre and opera. In order for such performances to be viewed as beautiful requires a concentrated synthesis of both perceptual and intellectual relationships. The coherence of the meanings constructed within the temporal unity which is the performance, and their relation to their extensions outside the performance; provide the basis from which the audience construct or apprehend the aesthetic form of the work.[45] In an analogous way, the viewer constructs the aesthetic form of the various contemporary branches of the visual arts: performance art, holograms, installation pieces and virtual realities.

5. Conclusion

In this paper, I have given an outline of how a unified theory of beauty might be developed.

The unified form which the perceptual process gives to the array of sensations it picks up, is the source of our experience of beauty. That is, when we experience beauty we are actually becoming aware of the processes which solve the problem of perception. Hence the experience of beauty has neither a determinate perceptual analogue nor a determinate concept.

If beauty is an experience of the principles involved in the construction of perceptual form and these principles are employed in a universal way for any particular form, we can say that purely perceptual beauty is universal and relatively unchanging. That is, the way the perceptual principles are epitomized or challenged will be universal. Intellectual beauty, on the other hand, is not so automatic. In order to appreciate intellectual beauty, one must have the appropriate grasp of the concepts involved. Hence, it is unlikely that intellectual beauty can significantly transcend cultural, experiential barriers. Furthermore, the kind of relations between concepts which give rise to harmony and unity; for example, the amount of tension that can be tolerated before a construct is no longer beautiful will be relative to cultures, individuals and even to stages throughout the one person's life time. According to this theory, beauty can be either predominantly perceptual or both perceptual and cognitive, and the degree to which perceptual beauty dominates the experience will be the degree to which a judgment of beauty can be considered to be universal and necessary.

In order to understand aesthetic form or beauty, we ought not think of the configuration itself as the source of beauty, but the way the perceptual processes underlying form construction have been employed in the process of perceiving the object which stimulates the experience of beauty. That is, the

source of beauty is the experience of perceptual processes solving the problem of perception of which we only become aware when the principles underlying this perceptual process are challenged or epitomized. Thinking of the experience of beauty in this way resolves the apparent dichotomies surrounding our understanding of beauty. In particular, it explains that peculiar phenomenology of beauty which leads us to the 'universal, unchanging - relative, dynamic' dichotomy.

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[1]Many thanks to Cynthia Freeland for reading two drafts of this paper and offering helpful suggestions. And thanks to my colleague Marie Brennan for her helpful comments on style.

[2]See Wladyslaw Tatarkiewicz, *The History of Aesthetics*, Vols. I & II, The Hague; Mouton, 1974.

[3] My approach here is part of a new and burgeoning field of philosophy which draws upon cognitive science in order to clarify the understanding of aesthetic issues. For example, see Cynthia Freeland, 'The Sublime in Cinema: Challenges for a Cognitivist Theory' in Gregory Smith and Carl Plantinga (eds), *Passionate Views: Film Theory and the Emotions*, Johns Hopkins Press, 1998. For further references visit the *Cognitive Science, Humanities and the Arts* web site moderated by Cynthia Freeland and Anne Jacobson at http://www.hfac.uh.edu/cogsci/index.html

[4]There is another tradition of beauty according to which sensuous qualities in themselves are beautiful (not in the sense of the purity of light proposed by Plotinus as this notion was incorporated into the Pythagorean tradition by Albert the Great and Aquinas as a clarity/brilliance shining through an object's form). In the alternative tradition, the pleasure experienced in the beautiful is not disinterested. This tradition can be traced as far back as the pythagorean one that I adopt. It emerges in the work of the Sophists, the Epicureans, and the particular theologians of the middle ages who denounced beauty as evil. It is an understanding of beauty which perhaps has its most sustained support in the 20th Century. It culminates in Guy Sircello's idea of the 'Properties of Qualitative Degree' which he argues constitute beauty. See his *A New Theory of Beauty*, Princeton University press, 1975; and his 'Beauty in Shards and Fragments', *Journal of Aesthetics and Art Criticism*, 48:1, Winter 1990, pp.21-35.

[5] Robert Zimmerman, 'Kant: The Aesthetic Judgment'. in Robert Paul Wolff (ed), *Kant*. A Collection of Critical Essays. London; Macmillan, 1968. pp.385-406.

[6] Umberto Eco. *The Aesthetics of Thomas Aquinas.* Translated by Hugh Bredin. Cambridge, MA; Harvard University Press, 1988. p.28.

[7] Aristotle. Poetics. In T.S.Dorsch (translator), *Aristotle, Horace, Longinus, Classical Literary Criticism.* New York; Penguin Books, 1965. pp.31-75.

[8] St. Thomas Aquinas. *Summa Theologiae* (1266-73). London & New York ; Blackfriars edition and translation. Vol.I-II, 27, 1 ad 3., 1964-76

[9] Eco, p.17.

[10] David Hume. *A Treatise of Human Nature* (1739-40) Ernest C. Mossner (ed). Penguin Books, 1969 and in his Of the Standard of Taste (1757). In Karl Aschenbrenner and Arnold

Isenberg (eds), *Aesthetic Theories: Studies in the Philosophy of Art* (New Jersey: Prentice-Hall, 1965), pp.107-125.

[11] Kant, *Critique of Judgment* (1790). Translated by Werner S. Pluhar. Indianapolis; Hackett, 1987.

[12] Hume, 1739-40, Book 2, Part 1, section 8.

[13] Mary Mothersill. *Beauty Restored*. Oxford; Clarendon Press, 1984.

[14] *Ibid*, p.118.

[15] *Ibid*, p. 143.

[16]See Diana Raffman's *Language, Music, and Mind*. Cambridge MA; Bradford/MIT, 1993, for an analogous treatment of the auditory perceptual module. For related evidence regarding touch see Roberta L. Klatzky, Susan J. Lederman and Dana E. Matula, 'Haptic Exploration in the Presence of Vision', in *Journal of Experimental Psychology: Human Perception and Performance*, Vol. 19, No.4, August 1993. pp.726-741. Of interest regarding this same question in the absence of vision and hearing see Helen Keller, *The World I Live In*, London: Hodder and Stoughton, 1908.

[17] David Marr and Keith Nishihara, 'Visual Information Processing: Artificial Intelligence and the Sensorium of Sight', in *Technology Review*, Vol.81, 1978, p.31.

[18]E. K. Warrington and P. Rabin, 'Visual span of apprehension in patients with unilateral cerebral lesions' in *Quarterly Journal of Experimental Psychology, 23*, pp.423-431.

[19] David Marr, *Vision*, Freeman Press, 1982, p.35.

[20] Marr also reasoned that vision would be made up of a series of independent modules because otherwise any adaptation or fine tuning to the system in the course of evolution would effect the whole system; hence it would make the system clumsy and inefficient.

[21]G. Humphreys, M.Riddoch & M. Boucart, 'The Breakdown Approach to Visual Perception: Neuropsychological Studies of Object Recognition' in G. Humphreys (ed), *Understanding Vision, An Interdisciplinary Perspective*, Oxford; Blackwell, 1992, p.123.

[22] Marr, 1982, p.103.

[23]Frances Egan, 'Intentionality and the Theory of Vision' in Kathleen Akins (ed), *Perception*, NY; OUP, 1996, p.245 (fn 2).

[24]Ilona Roth & Vicki Bruce, *Perception and Representation*. Philadelphia; Open University Press, 1995, pp.97-99

[25]Irvin Rock, *The Logic of Perception.* Cambridge, MA; MIT Press, 1983, pp.138-164.

[26] Marr, 1982, p.330.

[27]Irving Biederman, 'Higher-Level Vision' in D. Osherson, S. Kosslyn and J. Hollerbach (eds) *An Invitation to Cognitive Science Vol 2, Visual Cognition and Action.* Cambridge MA; MIT Press, 1990, pp. 41-72.

[28]Representations which become conscious as images could still be encoded sententially. Marr, for example, referred to internal perceptual form construction as a description. The theories of perception discussed in this paper are compatible with either isomorphic or sentential representations.

[29]Stephen Pinker, *How the Mind Works*, New York: Norton, 1997, p.270 & pp.279-284.

[30]Francis Crick & Christof Koch, 'Are We Aware of Neural Activity in Primary Visual Cortex' in *Nature*, Vol. 375, 11 May, 1995, pp.121-123.

[31] Jerry Fodor (The Modularity of Mind, Cambridge MA; The MIT Press, 1983, pp.57-58) Irvin Rock (1983, pp.39-40) and David Marr (1982, pp.71-73 & 356) all reasoned that the representations at this level could become consciously accessible. While this does not constitute my second condition (which involves the underlying principles not the representation itself), it is moving in the right direction.

[32]Michael Posner & Marcus Raichle, *Images of Mind* ,New York: W.H.Freeman and Company, 1994, pp. 144-147.

[33] Deborah Chambers & Daniel Reisberg, 'Can Mental Images Be Ambiguous?' in *Journal of Experimental Psychology: Human Perception and Performance*, Vol. 11, No.3, 1985, pp.317-328.

[34]See John McDonald, *Jeffrey Smart: Paintings of the 1970s and 1980s*, NSW: Craftsman House, 1990.

[35]See Glyn Humphreys, 'Spatial Representation and Selection in the Brain: Neuropsychological and Computational Constraints' in *Visual Cognition*, 1998, 5 (1/2), 9-47.

[36] In the collection of the National Gallery of Australia. See their web site: http://www.nga.gov.au/

[37]Gian-Carlo Rota, 'The Phenomenology of Mathematical Beauty', *Synthese*, Vol.III, No.2, May, 1997
[38] James McAllister, 'Truth and Beauty in Scientific Reason', *Synthese* 78 (1989).
[39] Monroe Beardsley, *Aesthetics: Problems in the Philosophy of Criticism*, New York: Harcourt, Brace and Company, 1958, Ch.5.
[40] *Ibid,* p.247.
[41] *Ibid,* p.251.
[42]Peter Kivy, 'Orchestrating Platonism', *The Fine Art of Repetition. Essays in the Philosophy of Music*, Cambridge University Press, 1993.
[43]Eduard Hanslick, *On the Beautiful in Music* (1854), translated by Gustav Cohen, edited by Morris Weitz, Macmillan, 1957.
[44]Diana Raffman, 1993.
[45] See Paul Thom, *For An Audience: A Philosophy for the Performing Arts*. Temple University Press, 1993. Thom develops the conceptual apparatus necessary for thinking of performance in terms of aesthetic form.