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Peter Paul Rubens and Colour Theory: an assessment of the evidence

by
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A Thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of Doctor of Philosophy

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For my parents

Also for P.J.B. with special thanks

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Abstract

Peter Paul Rubens' creative genius, as expressed with consummate mastery in his paintings, is but one of the many elements that have compounded to establish his fame. He is also renowned as a man of immense erudition. Indeed, his reputation is such that it is taken for granted that his great learning informed all aspects of his art in a fundamental way.

In accordance with this kind of thinking, current scholarship on Rubens accepts, as a matter of course, that the artist, whilst creating his painted works, followed the dictates of a colour theory, as we would know it today. In fact, on the basis of circumstantial evidence, it has been accepted that Rubens invented a colour theory that may be seen as innovative for his time.

This thesis assesses the evidence which has led researchers to formulate such a conclusion. As a consequence, it investigates the circumstances of Rubens association with François de Aguilon during the final stages of the latter's publication of his book on optics, the *Opticorum libri sex* . . . . As well, the artist's correspondence with his friend, Nicolas Fabri de Peiresc, which contains allusions to an autograph manuscript purported to contain Rubens' thoughts on colour, is re-examined. Indeed, this very correspondence reveals that Rubens did not consider himself particularly knowledgeable about the theoretical aspects of colour.

On the basis of a thorough review of these existing documents; an investigation into relevant biographical circumstances; and an examination of the artist's technique, it is here proposed that Rubens did not consciously apply theoretical principles to his craft, but rather, that any of the discernable elements of what is considered to be modern colour theory are in the paintings only because the demands of the painter's craft serendipitously parallel art historians' theoretical hindsight.

Résumé

Le génie créateur de Pierre Paul (Petrus Paulus) Rubens tel qu'il est exprimé avec une maîtrise achevée dans ses peintures, n'est que l'un des nombreux éléments qui ont contribué à établir sa renommée. Il est aussi reconnu comme un homme d'une grande érudition. En effet, sa réputation est telle qu'il est pris pour acquis que son savoir a informé tous les aspects de son art d'une façon fondamentale.

En concordance avec cette pensée, les spécialistes sur Rubens présument que l'artiste suivait les règles d'une théorie des couleurs dans la création de ses oeuvres, laquelle serait identique aux théories actuelles des couleurs, telle que nous la connaîtrions aujourd'hui. Toutefois, certains indices circonstanciels ont plutôt permis d'admettre que Rubens avait inventé une théorie des couleurs jugée novatrice à l'époque. Toutefois, certains indices circonstanciels ont plutôt permis d'admettre que Rubens avait inventé une théorie des couleurs jugée novatrice à l'époque.

Ce travail évalue les témoignages qui ont mené les chercheurs à formuler cette conclusion. Le champ d'étude porte donc sur les circonstances de l'association de Rubens à François de Aguilon, aux dernières étapes de la publication de son livre d'optique, *Opticorum libri sex* .... Il porte également sur la correspondance entre l'artiste et son ami Nicolas Fabri de Peiresc, dans laquelle on retrouve des allusions à un manuscrit de Rubens qui contiendrait ses réflexions sur la couleur. En effet, cette correspondance montre que Rubens lui-même ne se reconnaissait pas de compétence particulière quant aux aspects théoriques de la couleur.

Par un examen approfondi de ces documents ainsi que par une étude des techniques de l'artiste et de circonstance biographique pertinente, il est proposé que Rubens n'a pas

appliqué consciemment des principes théoriques à son art mais plutôt que tout élément que l'on considère comme associé à la théorie moderne des couleurs et que l'on identifie en ces même termes dans son oeuvre, ne l'est que parce que les exigences de l'art du peintre sont définies par le regard rétrospectif (se développant selon une logique "d'après-coup") de l'historien d'art.

List of Illustrations

INTRODUCTION

Sir Peter Paul Rubens was one of those rare and fortunate individuals in whom great creative genius, consummate mastery of craft and energetic self-discipline are conjoined in one personality. This happy circumstance alone would have insured his artistic success and renown.

However, Rubens was further blessed with an intellect that earned him the reputation for being the most learned of painters. In fact, his erudition has, in many ways, become a cornerstone of that unparallelled fame which he enjoyed then and enjoys now. Unquestionably, his scholarly abilities, attested by his peers, and proven in a most convincing manner by his own writings, have determined, in large measure, our perceptions of his art and his persona. It has come to be taken for granted that, in the case of Rubens, his technical skills, his craftsmanship - the wisdom of his hands, if you will - were overshadowed, even dominated, by his intellect. In short, it is accepted as axiomatic that Rubens' art, on all levels, was informed, even dictated, by theoretical considerations.

If, in the context of this essay, we now turn our attention to Rubens' purported associations with colour theories, we are immediately faced with the difficulties caused by such *a priori* assumptions. We find that our view is blurred, even obscured, by his reputation as a theoretician, which, as I show here, was in many ways manufactured posthumously. This reputation presumes, as a matter of course, his colourism. As a consequence, our investigations run the risk of being determined, even compromised, by a too-ready acceptance of this view. Indeed, I show here that these presumptions continue to be repeated, and elaborated, to this day in a self-referential manner.

An examination of the literary remains, fragmentary as they may be in this regard, seems to me more likely to be revealing of Rubens' colour theoretical ideas than would a re-examination of his painted works. Using the paintings as evidence with which to posit a theory does not seem appropriate. In fact, it is unsatisfactory, for reasons which I explain below; the writings, autograph and others, offer a much better starting point. This is not meant to diminish in any way the importance given to the physical evidence presented by the paintings; and I do review Rubens' painting technique, insofar as it is relevant to this essay, in the first chapter.

The assumptions about Rubens' colour ideas are tantalizing, and art historians have, of course, devoted their attentions to his use of colour. However, for all that, the compass of these discussions is still rather small. The significant literature comprises a short list. Willy Schmitt-Lieb has written on colour as unity in the work of Rubens; he explores, in the main, the paintings in the collections in Munich. Eberhard von Zawadzky has written on the artist's colour and chiaroscuro with an emphasis on the *Medici Cycle.* Theodor Hetzer devoted a chapter to Rubens' colour in his book on Titian. Similarly, Hans Gerhard Evers also included a chapter on Rubens' colour in his monograph on the artist. Others, such as Sir Kenneth Clark in his book on *The Nude* , have added elegantly stated, but brief, insights into the artist's use of colour and paint whilst discussing other topics.[1]

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[1] Willy Schmitt-Lieb, "Die Farbe als Einheit bei Rubens Münchener Bildern, "diss. Erlangen, 1948; Eberhard von Zawadzky, "Helldunkel und Farbe bei Rubens," diss. Munich, 1965. Zawadzky includes a review (up to 1965) of evaluations of Rubens' colour in the art historical literature (105-114). Theodor Hetzer, *Tizian; Geschichte seiner Farbe* , Frankfurt,1935, 1948; Hans Gerhard Evers, *Peter Paul Rubens*, Munich, 1942; Sir Kenneth Clark, *The Nude: A Study in Ideal Form*, London, 1956.

A small number of articles about the artist's use of colour have also been published, most notably, perhaps, those of Lorenz Dittmann and Hans Sedlmayr.[2] The literature on Rubens' technique has also been thoroughly examined in a series of articles by Hugo von Sonnenburg; further contributions on the same theme have been made by A. and P. Philippot, Joyce Plesters and others.[3]

The recent art historical literature that deals specifically with Rubens as a colour theorist is also limited; in this case to the writings of Charles Parkhurst, Julius Held, Michael Jaffé, and Wolfgang Jaeger.[4] Significantly, all references, subsequent to this set of writings, to Rubens as a colour theorist rely on the conclusions that these authors reached through their investigations of Rubens' purported association with Franciscus Aguilon (Aguilonius) and their assumed collaboration in a book of optics.

In actuality, written evidence for Rubens as a colour theorist, either autograph or contemporary, is tantalizing in its sparseness. In the correspondence, specifically in letters

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[2] Lorenz Dittmann, "Versuch über die Farbe bei Rubens," *Rubens. Kunstgeschichtliche Beiträge*, ed. Erich Hubala, Konstanz, 1979, 37-72; Lorenz Dittmann, "Helldunkel und Konfiguration bei Rubens, "*Intuition und Darstellung* , Munich,1985, 105-116.; Hans Sedlmayr, "Bemerkungen zur Inkarnatfarbe bei Rubens," *Hefte des Kunsthistorischen Seminars der Universität München*, 9/10, 1964, 43-54.

[3] Hugo von Sonnenburg, "Rubens. Gesammelte Aufsätze zur Technik," *Mitteilungen, Bayerische Staatsgemäldesammlungen München*, vol. 3, Munich, 1979; Joyce Plesters, "*Samson and Delilah* : Rubens and the Art and Craft of Painting on Panel," *National Gallery Technical Bulletin* , 7, 1983, 30-49; C. Brown, A. Reeve, M. Wyld, "Rubens' *The Watering Place*," *National Gallery Technical Bulletin*, 6, 1982, 27- 39; R.D. Buck, R. Feller, B. Keisch, R.C. Callahan, "Rubens' *The Gerbier Family*," *Studies in the History of Art , National Gallery of Art , Washington* , Washington, 1973; A. and P. Philippot, "La Descente de Croix de Rubens: Technique pictural et traitement," *Bulletin Institut Royal*, 7, 1963. see also the bibliographies in these.

[4] Charles Parkhurst, "Aguilonius Optics and Rubens' Colour," *Nederlands Kunsthistorsch Jaarboek*, 12, 1961, 35ff.; Charles Parkhurst, "Red-Yellow-Blue: A Color Triad in Seventeenth-Century Painting," *Baltimore Museum of Art Annual*, 4, 1972, 33ff.; Julius Held, "Rubens and Aguilonius: New Points of Contact," *Art Bulletin*, 61, 1979, 257ff.; Michael Jaffé, "Rubens and Optics," *Journal of the Warburg and Courtauld Institutes*, 34, 1971, 362-65; Wolfgang Jaeger, *Die Illustrationen von Peter Paul Rubens zum Lehrbuch der Optik des Franciscus Aguilonius 1613*, Heidelberg, 1967.

to and from Rubens' friend, Peiresc, we have references to an autograph manuscript or essay by the artist devoted to his thoughts on colour . But, at the same time, this exchange contains a telling statement by Rubens in which he essentially avers that he is not conversant with a colour theory. I discuss this evidence in detail below. We also have references to Rubens' notebook or *Pocketbook* . This is actually a loose collection of his writings which is supposed to have contained, in manuscript form, the artist's ideas about colour along with some of his other thoughts on art, as well as a body of drawings. We know something of this notebook thanks, in the main, to Roger de Piles, who published in his own work at least a part of it: the essay on the imitation of statues. This thesis reviews the evidence contained in the notebook as well.

We do have a fairly comprehensive record of Rubens' association with Aguilonius which is examined here in detail. However, it is paramount to keep in mind that, overall, the evidence for a colour theory is thin and at best *circumstantial.* The issue is clouded, as I have suggested, by the fact that the artist's reputation has made it a commonplace to assume that his painting was guided by an independent colour theory. For instance, as may be seen in our references to the art theoretical debates in seventeenth- century France, colour, after Rubens' death, was assigned increasing importance in painting, until the latter part of the eighteenth century, when, in fact, as John Gage has pointed out, the study of colour underwent one of the most profound revolutions in western art.[5]

In 1672, Roger de Piles, Rubens' champion, wrote in his *Dialogue* :

> During the all-but three hundred years since the revival of painting, we can hardly reckon half-a-dozen painters who have coloured well; and yet one could list at least thirty who have been outstanding draughtsmen. The reason for this is that drawing has rules based on proportion, on anatomy, and on a continual experience of the same data; whereas colouring has as yet hardly any well-known rules, and,

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[5] John Gage, *Colour in Turner: poetry and truth*, London, 1969, 11.

since the studies made have differed according to the different subjects they treated, no very precise body of rules has yet been established.[6]

Apart from what is actually said here, this statement is perhaps significant for the other reason that de Piles appears to be unaware of any colour theory, explicit or implicit, which might have been associated with Rubens. De Piles would surely have delighted in citing any such references if he had been able to.

By 1867, Charles Blanc could write the directly opposing view: "Not only can colour, which is under fixed laws, be taught like music, but it is easier to learn than drawing, whose elaborate principles cannot be taught."[7]

This revolutionary change in attitude toward colour can as Gage has suggested, be attributed primarily to three factors: a complete reversal of the long-reigning aesthetic which traditionally regarded colour as a secondary element in painting, separable and, indeed opposed to form; a willingness to see new scientific discoveries as having relevance in art; and, scientists' formulation of an easily understandable colour theory based on a set of three primaries. These attitudes become interrelated and encouraged a more consciously theoretical approach to painting and the teaching of it than had been commonly seen before the nineteenth century.[8] Indeed, it is the legacy of such developments and changes in attitudes that influences our assumptions about colour and its use in painting.

During the course of the eighteenth century, Rubens (helped by the writings of de Piles and others - we recall that, in a most vocal way, France was the home of academic formulation), increasingly, came to be seen as the artist who had brought perfection to

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[6] Roger de Piles, *Dialogue sur le Coloris*, 1672, as cited in John Gage, *Colour in Turner*, 11.

[7] Charles Blanc, *Grammaire des Arts du Dessin*, 1867, as cited in John Gage, *Colour in Turner*, 11.

[8] John Gage, *Colour in Turner*, 11.

painting. This reputation rested in no small way upon his perceived use of colour. Pilkington's *Dictionary* (1805) held that, "He is by all allowed to have carried the art of colouring to its highest pitch."[9] It was believed, without doubt, that he had based his colouring upon sound theoretical foundations. For the eighteenth and nineteenth centuries, the theory could not be other than one based on three colours we accept as so-called primaries: red, yellow and blue. We must point out, however, that Rubens' own writings on the matter appear not to have been available to writers and critics, thus his theory, or rather, the one attributed to him, cannot be other than an attempted reconstruction. It follows that any reconstruction would quite naturally take as a starting point the ideas current at the time of its devising.[10]

Deschamps, one of Rubens' eighteenth-century biographers, included in his *Maxims*, which were attributed to the artist, the advice that in painting flesh tones, the colours should be placed next to each other, with very little blending. Though the source for these ideas is not known, it sounds much like what De Piles wrote: *Prenéz les couleurs les plus belles comme un beau rouge, un beau jaune, un beau bleu, un beau verd, et les mettez séparément les uns auprès les autres, il est certain qu'elles conserveront leur éclat et leurs force en particulier et toutes ensembles; que si vous les mêlez, vous n'en ferez qu'une couleur de terre* (*Seconde Conversation ...* : 1677).[11]

De Piles mentions four colours and does not name Rubens, but again, the idea that Rubens' practice was seen as being based on a three colour theory - the primaries red, yellow, and blue - is given weight by the remarks of William Hogarth in his *The A· ·lysis*

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9 As cited in John Gage, *Colour in Turner*, 62.

10 Rubens' own writings on colour seem to have survived until the end of the century, however, we have no records or transcriptions, which would be expected if his theory really was known. I elaborate on the history of this manuscript below.

11 Deschamps, *Les Vies des Peintres Flamands* , 1753, I, 310; De Piles, *Seconde Conversation ..., 1677,* 303, both as cited in Gage, *Colour in Turner,* 63, 239, n.38.

of Beauty : "Rubens boldly, and in a masterly manner, kept his bloom tints bright, separate and distinct, but sometimes too much so for easel or cabinet pictures ... The difficulty ... lies in bringing *blue* , the third original colour, into flesh, on account of the vast variety introduced thereby; and this omitted, all the difficulty ceases ...."[12]

These ideas about Rubens came more and more to be seen as a given. Indeed, by the nineteenth century, the belief that Rubens based his work on a theory that held that the colours red, yellow and blue were primary was so insistent as to be dogmatic! Nineteenth-century discoveries into the nature of light and the electromagnetic spectrum, which inform all of our present ideas about the nature of colour, could not help but to reinforce these views.

Delacroix, for one, claimed that Rubens' theory was the basis of his whole career as a colourist.[13] He had studied Rubens' *Medici Cycle* carefully while he was working on his *Bark of Dante* ; he was trying to perfect the rendering of drops of water on a torso using red, blue and pale yellow. He also studied the optical principles of the rainbow as he worked.[14] When Delacroix finally saw the *Raising of the Cross* in Antwerp in August of 1850, he wrote in his *Journal* that he was most deeply moved. He also saw similarities between Rubens' composition and that of Gericault's *Raft of the Medusa* .[15] Gericault copied the works of Rubens on many occasions during his career; the figures in the *Raft*

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[12] William Hogarth, *The Analysis of Beauty,* ed. Burke, London, 1955, 133, also cited in Gage, *Colour in Turner* ,63.

[13] See M. Kemp, *The Science of Art: Optical Themes in Western Art from Brunelleschi to Seurat* , New Haven, London, 1990, 308. See also L. Johnson, *The Paintings of Eugène Delacroix. A Critical Catalogue 1821-31* , Oxford, 1981, I, J. 100, and a review by J. Gage, *Art Book Review, I, 1983, 42-45.*

[14] John Gage, *Colour in Turner* , 63.

[15] H. Wellington, ed., *The Journal of Eugène Delacroix* , trans. L. Norton, New York, 1980, 134.

are some of the most interesting quotations from the older artist. This would, of course, not have been lost on the young Delacroix, who modeled for one of the figures in the *Raft*.

Delacroix also made numerous copies of Rubens' works during his lifetime; he copied other artists as well, but Rubens occupied the supreme place among earlier artists for him. But Delacroix, in the final analysis, painted very differently from Rubens. He never really imitated Rubens' colourism or even the sculptural quality of his work.[16] Nevertheless, he identifed deeply with Rubens, even writing in his *Journal* that he "cared to be Rubens."[17] Delacroix saw Rubens as the "Homer of painting, the father of warmth and enthusiasm in art, where he puts all others in the shade, not perhaps because of his perfection in any one direction, but because of that hidden force - that life and spirit - which he put into everything he did."[18] And yet, interestingly, we find as well perpetuated the traditional views, which I allude to below, about Rubens' faulty drawing. Delacroix noted that a black and white photographic reproduction of the *Descent* "interested me greatly; the inaccuracies are more apparent when they are no longer saved by execution and colour."[19]

Henry Howard wrote in the 1830's that Rubens' flesh tints,

> exhibit a peculiarity of treatment which we do not find in any other artist, excepting in some of his imitators. I allude to that decided separation of the flesh-tints into distinct stripes, lying side by side (a dissection of the local colour which is so remarkable in many of his works). His highlights are almost yellow; next to those a bright rosy or deep red, as the complexion required; then a strong grey tint, almost blue, running into still warmer reflections. These, when viewed from a

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16 L. Hourticq, "Rubens et Delacroix," *La Revue de l'art ancien et moderne* , 26, 1909, 222-228.

17 H. Wellington, ed., *Journal* ,199.

18 H. Wellington, ed., *Journal* , 199.

19 H. Wellington, ed., *Journal* , 406, 211. The reference to Rubens' faulty drawing is also cited in Peter C. Sutton, *Rubens* , 104, n.334.

sufficient distance, whence they come in a blended state to the eye, acquire the tone and effect of Nature, and gain in brilliance from their crudeness.[20]

Hans Sedlmayr, in a more recent examination of Rubens' colour, echoes both Hogarth and Howard when he writes about the artist's formulation of flesh tints. He remarks on the use of red, yellow and blue. He sees the carnation based on red and white, a pink through which a pure red occasionally peeks. The peach colour of some tones is achieved with the yellow and white (or light grey, as he puts it). These two mixtures are still "natural." Sedlmayr sees the use of the easily recognizable blue in the make up of the skin colour as "unnatural." It is not, as he says, descriptive, nor is it objective - not a shadow nor a vein shimmering through the skin - but rather it is there because Rubens saw human skin colour as the embodiment of the three "high" "pure" colours; the three basic or primary colours that are the epitome of all colours and the highest expression of light.[21]

Sedlmayr's view that for Rubens the only colours appropriate for human skin tones were the "high" "pure" colours of our modern primary triad *because* they were the primary colours makes clear - and this cannot be overemphasized - how our thinking has been influenced by our inherited conceptions. It is assumed that Rubens did in fact have a colour theory; the only plausible theory is the modern three-colour one; therefore, Rubens' theory must have in some way incorporated those ideas.

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[20] H. Howard, *A Course of Lectures on Painting* (London, 1848), 172-173, cited in Martin Kemp, *The Science of Art*, 276, and John Gage, *Colour in Turner*, 63-64.

[21] Hans Sedlmayr, "*Bemerkungen* ," 1964, 170. "Bei Rubens wird die Farbe des hellen - "weissen" - Inkarnats als Inbegriff der drei Grundfarben Rot, Gelb und Blau, ja gewissermaßen als Inbegriff *aller* Farben und zugleich als höchste Äusserung des Lichtes im Bereich der Farbe aufgefasst ... Die Basis ist die Mischung Rot und Weiss - also ein Rosa -, aus welcher das Rot an manchen Stellen ... hervortritt. Eine Beimischung von Gelb und allenfalls Hellgrau ergibt den pfirsichfarbenen Ton, und so weit ist alles noch "natürlich". Unnatürlich ist aber das Hinzufügen eines bläulichen Tones, den man aus dem Gesamtresultat der Inkarnatmischung ohne weiteres heraussehen kann. Er hat durchaus keine gegendständliche, keine darstellende Bedeutung; er steht nicht für die Bläue durchscheinender Adern da, auch nicht für blauende Schatten, sondern ist da, nur weil von Rubens die Farbe der menschlichen Karnation als Inbegriff der drei "hohen", "reinen" Farben aufgefaßt und gesehen wird."

The use of the three colours - red, yellow and blue - along with white, by Rubens, is, of course, not disputed, indeed, they are necessary, as I show below, in the mixing of convincing flesh tones. An examination of the received idea of their use by the artist on a self- conscious theoretical basis is, however, called for.

The *"locus classicus"* of the beginnings of this discussion is to be found in the aforementioned writings of Charles Parkhurst, Julius Held, and Michael Jaffé. Also of import is the discussion by Wolfgang Jaeger of Rubens' illustrations for the optical text by Aguilon.

It is these illustrations that provide the leading and tantalizing evidence for the idea that Rubens had a colour theory. They represent the clearest connection that we have between Rubens and a scientific work dealing specifically with optics and colour. Further, the illustrations accurately and appropriately illustrate the material contained in the text; Rubens, we must assume, knew and understood the concepts put forward. It has also been assumed, as I review below, that Aguilonius and Rubens had a long and friendly association. As well, Aguilonius even makes a reference to artists and their expertise in his text discussing the nature of colour. This constellation of factors has fostered the notion that the professional relationship between the two men was, at least in this specific, a collaboration, rather than a simple commission for illustrative material.

The nature of the association between Rubens and Aguilonius needs to be reconsidered, as does Rubens' general association with any form of colour theory. In addition, it is necessary to review Rubens' reputation, its creation with respect to both what he was responsible for, and how admirers and scholars have so enhanced it over the years that it is now commonplace to recognize that Rubens not only adhered to but actually developed a colour theory.

However, before beginning this assessment of all of the evidence for Peter Paul Rubens' association with, not only Aguilonius' optical theories, but with colour theories in general, it is appropriate, even necessary, to back away from the topic at hand and to concentrate for the moment on colour and colour theory in a broader context. This is important because a review of some of our assumed ideas about colour and its nature and a brief, pointed, survey of the evolution of modern colour theory, will reveal some of the unrecognized biases and prejudices that profoundly, yet unconsciously, affect the ways in which we think about, talk about, indeed, even see colour.

CHAPTER I: COLOUR AND COLOUR THEORIES

Colour and the study of colour are vexed issues, not the least because of the paradoxical way in which they have been, and continue to be, treated. A congruency of views on colour is difficult to achieve; indeed, even speaking about colour is fraught with the very real possibility of creating unwanted misunderstandings. Ironically, this is so in spite of the fact that most people, at least most of those who are not visually disabled or impaired, apprehend colour, and understand it innately, as a matter of course. Still, scholars from many and diverse fields, each with a unique point of view, have claimed colour as their own and have found it incumbent upon themselves to offer up their versions of explanations as to its nature. Assembling the many theories into a coherent whole is a virtual impossibility; however, physics, which has addressed the question of how colour is caused, has been by far, the most influential of disciplines. It offers what appear to be solid explanations of the properties of colour. The ideas that have been put forward seem convincing, and have been generally accepted, not least because implicitly they bear the rigorous authority of Science.

If we look carefully at hypotheses formulated in other fields of study in which investigators have had occasion to consider colour, its nature, its function, or even its beauty and harmony, we find, no matter what the discipline (whether it be philosophy, history, aesthetics, biology, psychology or the social sciences) that in each case the ideas and the conclusions about colour have been influenced, perhaps even compromised, at a fundamental level by the unquestioning acceptance of assumptions instigated by physics.

For example, at an early stage in their schooling, English- speaking children are very likely to be taught to recite, by rote, the word sequence "red, orange, yellow, green, blue, violet." These are the familiar hue names which form part of that short list of

commonplace words designating the colours known as primal colour names, or simply *primals*. It is noteworthy that, by this time - the beginning years of formal schooling - it is taken as a given, without comment or any evidence of appreciation, that children, at some younger age still, have attained what amounts to a basic comprehension of colour, which is often assumed to be universal.

It should also be emphasized that *learning* about colours and *understanding* the names are another two of those early childhood tasks, which, once accomplished, are almost immediately taken for granted. Implicit in the acceptance of this accomplishment is the unspoken assumption that this newly acquired skill is the most natural of developments. However, gaining an understanding of colour names, which is a very different skill from distinguishing colours, presupposes a large measure of sophistication in the young learner.

Colour names can only be taught by ostensive definition: teaching the meaning of a word without resorting to other words for explanation. In short, one learns colour names by someone pointing to examples of the individual colours while simultaneously expressing their particular names. To benefit from this type of teaching, in addition to knowing that perceptions can be communicated, and, that such communication is not only worthwhile, but may even be important, the pupil must also know that objects have names, and that, in this instance, colour names must not be confused with objects. For example, if one indicates a plot of fresh grass and says the word green, one expects to be understood as talking about the relationships of objects, not the grass itself. Comprehending this is an astonishing intellectual feat for a young child after which, by comparison, distinguishing between the adjectival use of colour and object names becomes a relatively simple matter: grass green is different from green grass.

Red, Orange, Yellow, Green, Blue, Violet: children are taught to recite this particular sequence of primals (It is noteworthy that some of the other primals, like brown, and black and white [the so-called achromatic or colourless colours] are left out.), not

because any real value exists in knowing this arrangement of this particular series, but rather, and more likely, because there is an imagined "rightness" to the order. After all they are the major hues (One might try to imagine a new colour which does not have one of these as a component in its makeup.); they match in sequence the colours in the rainbow; and, they are also the spectral colours most commonly identified with the visible portion of what we now call the electromagnetic spectrum (Fig. 1). There is a sense of order in all this that is comfortable; however, the use of a single set of names for this purpose, has led to or reflects, as Patricia Sloane has pointed out, the accepted implication of the idea that the spectrum presents the hues in their most typical and purest form.[22] *Pure*, a much overused and debased descriptive term, is often applied to colour, and not only to colour, in ways that are essentially meaningless. And yet, the use of *pure* in this context has, nonetheless, had a profound impact on the way we think about colour. Implicit in *pure* is its antithesis *impure* ; we often understand these adjectives as synonyms for *perfect* and *imperfect*. A further, seemingly logical, step in our reasoning may also lead us to see *pure* and *perfect* as equivalents for *beautiful* , and, in addition, in the context of colour descriptions, for *bright*. This latter term, like the others, is usually applied to one of the spectral hues. For instance, it is difficult to imagine a bright black or brown.

Most of the literature on colour assumes that three variables are sufficient for a complete description of a given colour: hue, value and chroma or chromaticity. Indeed, we are now used to describing colours in terms of these perceived qualities as a matter of course. The last two, which are both meant as a degree of brightness or saturation of hue, though sounding suitably scientific, are in actual fact very difficult to measure in any meaningful way. In addition, they connote and are understood in the old sense of perfection and unsullied purity. The same can be said for our understanding of *value*, which is a measure of the *lightness* of a given tint or shade. Value is often more prosaically

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[22] Patricia Sloane, *The Visual Nature of Color*, New York, 1989, 187.

spoken of as a measure of the amount of white or black in a colour. Again, it is important to remember that "white" and *lightness* are not synonymous. In addition, "black" is not really an equivalent for *darkness* or a lack of light. The continued use of the terms "black" and "white" in such a casual manner is yet another poignant example of the difficulties in interpretation of meanings usually encountered in any discussion of colour.

We do not generally speak of pure pale colours or pure pastels; we do, however, describe colours as muddy, dirty or dull when they are not what we are used to thinking of as the *pure* hues. This, of course, raises the question, what is an impure colour? A moment's thought leads to the inevitable conclusion that there are no impure colours, and yet our habitual imprecision in the use of language makes the description still seem plausible, indeed, there seems even to be a hint of a moral judgment in the use of this adjective, "impure."

Such imprecision in language is misleading in another instance as well, though in this case, the misapprehension is perhaps more subtle in its effect. Often when pupils have learned the hue names they are left with the idea that they have learned not just the spectral hues, but the colours as well. This has led, as Sloane has also noted, to the confusing habit of using *colour* to denote, at various times, all colours or only the major hues.[23] This lax use of language has led, as can only be expected, to misunderstandings about, not only colour, but also the various theories hoping to explain colour.

If we accept, for the moment, that *colour* means *all* colours, we might then be tempted at some time to ask just exactly how many colours there are. There have been numerous guesses, which range wildly in scope, from fewer than seven hundred to many millions. The American National Bureau of Standards estimates that about ten million

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[23] Patricia Sloane, *Visual Nature* , 188.

surface colours can be seen by the human eye.[24] However, guessing the number of colours that can be seen, and then providing an estimate, of this magnitude, begs the question. And, in fact, the question is unanswerable in any practical way; the number of colours can never hope to be determined because colour is a continuum. If we made a list of colour names or arranged an order of colour samples, we would find that any two colours in this list or set are separated by a range - as large as we like - of intermediate colours.

As an aside, it should be pointed out here, that there is a subtle complication in understanding inherent in the very act of making a list of colours. To wit, in making such a list, we accept, implicitly, the idea that there is an organizing principle that can be applied to, or discerned in, any investigation of colour and its phenomena. Further, one is likely to be led, by this list or organization, to the inference that there is a relationship between its members that goes beyond simply being included on that list. In short, one might be led to assume some sort of hierarchy or ranking of the individual members.

This kind of reasoning can be found at the root of most theories of colour; after all, even a superficial review of historical theorems reveals that, in every instance, the ideas developed were predicated on the assumption of the existence of a series of basic or primary colours. It must be emphasized at once that this approach is, without any doubt, appropriate and useful. It cannot fail to provide insights that are illuminating, but, for all of that, it must be recognized that, in the case of colour, making a list often amounts to the creation of a polite and comfortable fiction.

The number of colours is infinite. Making a comprehensive list and counting colours, as Sloane reminds us, becomes an impossible task because one would not even

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[24] National Bureau of Standards. Inter-Society Color Council, *The ISCC-NBS Method of Designating Colors and a Dictionary of Color Names*, NBS Circular 553, n.d., 4.

know where to start.[25] Practically speaking, and as implied earlier, the number of colours is limited by human perception; but we all see differently, either innately or by training; so even in this respect we cannot arrive at a numerical standard.

When we realize how many colours there really might be, even if that number can be made to seem somehow less daunting by arranging, or organizing, colours according to hue or hue families, we cannot help but to have some misgivings about the usefulness of those, all too familiar, colour diagrams and circles that make claims to bringing some order to colours and their relationships. When such diagrams use words, often in conjunction with a numerical form of notation, the viewer is left to his or her own devices to imagine just which colour is meant by a hue designation. When the diagram is presented with colour samples, it is, of course, easier to see the relationships expressed. But again, misgivings are awakened when one asks just how this particular colour, with its unique chroma, value, and, indeed, hue, was chosen as exemplary. (One is forcibly reminded of the many printed colour swatches and charts that are employed in different industries [for instance, in paint manufacture and in the graphic arts] which bear the warning that the colours as printed are not the real colours [whatever that means] because of the limitations of printing processes and photographic technologies.)

The circular diagram or wheel incorporating the spectral hues is thought to have been invented by Sir Isaac Newton.[26] It is the result of conclusions that Newton reached after conducting his famous series of experiments with colour while still a university undergraduate at Cambridge in 1666. This year is therefore seen as fundamental in the history of colour theory. It is perhaps further noteworthy that the date is also of particular relevance in the context of this study; we remind ourselves that Newton's colour theory,

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[25] Patricia Sloane, *Visual Nature* , 11.

[26] Charles Parkhurst, Robert L. Feller, "Who Invented the Color Wheel?," *Color Research and Application* , 7, 1982, 217-230.

which is the basis for our modern theories, post-dates Rubens' death by a quarter of a century. Implicit in this observation is the *caveat* that we should be wary of being tempted by the power of hindsight to attribute modern views to individuals living *ante quem* .

The conventional history has it that Newton had obtained a "Triangular glass-Prisme, to try therewith the celebrated Phenomena of Colours."[27] He used this prism, as he claimed, to separate white light into its constituent elements:

1. The Sun's light consists of rays differing by indefinite degrees of refrangibility.

2. Rays which differ in refrangibility, when parted from one another do proportionally differ in the colours which they exhibit. These two propositions are matters of fact.

3. There are as many simple or homogeneal colours as degrees of refrangibility.[28]

Newton, as is implicit in his reference to trying " the *celebrated* Phenomena of Colours," had been preceded in his experiments with prisms by such thinkers as René Descartes, Robert Hooke, Robert Boyle, Marcus Marci and Francesco Maria Grimaldi; his search for a mathematical explanation of colours is also inherent in the later developments of the much older Aristotelian conceptions about colour.[29] However, these in no way compromise the brilliance of his ideas.

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[27] *The Correspondence of Isaac Newton* , ed. H. Turnbull, Cambridge, 1959, 1, 92-102; and "A Letter of Mr. Isaac Newton . . . containing his New Theory about light and Colours," *Philosophical Transactions of the Royal Society, 80, 3075-3087.* See also R. Westfall, "The Development of Newton's Theory of Colour," *Isis* , 53, 1962, 339-358; and, A. Shapiro, "The Evolving Structure of Newton's Theory of White Light and Color," *Isis* , 71, 1980, 211-235.

[28] *Correspondence* , 1, 97.

[29] René Descartes, *Opera philosophica* Amsterdam, 1672; Robert Hooke, *Micrographica* , London, 1665; Robert Boyle, *Experiments and Considerations touching Colours . . .* , London, 1664; Marcus Marci, *Thaumantias; Liber de arcu coelestis deque colorum apparentium natura, ortu et causis*, Prague, 1648; Francesco Maria Grimaldi, *Physico-*

All earlier theories relied upon the modification of white light to produce colour. Light, of course, has no colour. *White* light is usually taken to mean *clear* light. Conventionally, it is also referred to as *pure* light, though *pure* conjures up all the implications alluded to earlier, as also, for that matter, does the phrase "*modification* of white light."

Newton took a different approach; he called for a division of that white light, into discrete parts, to produce colour. Sunlight was no longer seen as a homogeneous substance that was somehow changed to make colours; it was now a heterogeneous mixture of unique rays with distinct properties. Certain of these rays could not be analyzed further since they could not be broken down into smaller units by more refraction. Rather they displayed a constant degree of refrangibility. Those rays which could not be decomposed further, Newton regarded as the "primary colours." It should be reiterated that all attempts at the formulation of a colour theory have, at their root, the wish to identify and to establish a set of primary or basic colours.

Newton published his great work on colours in his *Opticks* in 1704; by then he had settled on the now familiar canonical set of seven primaries: red, orange, yellow, green, blue, indigo and violet.

In the *Opticks* , specifically in Book I, Part II, between Proposition II and Proposition III, Newton provides an illuminating definition:

> The homogeneal Light and Rays which appear red, or rather make Objects appear so, I call Rubrifick or Red-making; those which make objects appear yellow, green, blue, and violet, I call Yellow-making, Green-making, Blue-making Violet-making, and so the rest. And if at any time I speak of Light and Rays as coloured or endued with Colours, I would be understood to speak not philosophically and properly, but

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mathesis de lumine, Bologna, 1665. For a synopsis of earlier experiments, see: Thomas Lersch, "Farbenlehre," *Reallexikon zur deutschen Kunstgeschichte*, Stuttgart, 1937-: vol. 6, col. 157-274.

> grossly, and accordingly to such Conceptions as vulgar People in seeing all these Experiments would be apt to frame. For the Rays to speak properly are not coloured. In them there is nothing else than a certain Power and Disposition to stir up a Sensation of this or that Colour. For as Sound in a Bell or musical String, or other sounding Body, is nothing but a trembling Motion, and in the Air nothing but that Motion propagated from the Object, and in the Sensorium 'tis a Sense of that Motion under the Form of Sound; so Colours in the Object are nothing but a Disposition to reflect this or that sort of Rays more copiously than the rest; in the Rays they are nothing but their Dispostions to propagate this or that Motion into the Sensorium, and in the Sensorium they are Sensations of those Motions under the Forms of Colours.[30]

Newton's claim or recognition of the fact that the refracted rays were not in themselves coloured, but rather elicited the response of colour in the eye and brain, implicitly illustrates the difficulties encountered when investigating colour: the incompatibility of treating colour simultaneously as a sensation, that is physiologically or psychologically, and as a physical phenomenon, that is as a product of wavelength and frequency in the electromagnetic spectrum. I call attention to this problem, in this context, only as another illustration of the stumbling blocks encountered when discussing colour.[31]

Despite the undisputed genius of Newton, conceptual difficulties crept into his theory, which, however, have been generally identified. But they, in the main, have been obscured by the theory's popularization and the enthusiastic reception of its ideas. Moreover, the complexity of the intellectual structure of the *Opticks* tended to overwhelm the problems. Four of these should be explored in the context of this essay.

An initial problem is the number of primaries, which I discuss momentarily.

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[30] Isaac Newton, *Opticks* , 4th ed., London, 1730; repr. New York, 1952, 124-125. See also, Eckart Heimendahl, *Licht und Farbe*, Berlin, 1961, 19-22.

[31] See Eckart Heimendahl, *Licht und Farbe*, 1-12, for a discussion.

A second dilemma is caused by the number of colours. We have seen that their number is infinite. Newton realized this and also understood that the continuous transitions of colours in the spectrum indicated a continuous range of refrangible rays. This idea of an infinity of colorific rays is largely obscured, to the point of concealment, in the *Opticks*. [32] Indeed, as I elaborate below, the musical analogy seems to have served to this end as well.

Another problem revolves around the identification of colour through degrees of refrangibility. Some colours exist as mixtures and as a primary in the spectrum. Green, for instance, can be made by mixing blue and yellow, yet it is also a spectral colour. This, in turn, leads to another issue: Newton's assumption that compound colours, like green, could be made the same way using both lights or pigments; i.e., yellow light plus blue light make green, which, of course, is not the case. As a clarification of this point, we recall: mixing yellow pigment with blue pigment results in green; mixing yellow light with blue light gives "white" light. To speak of white light is, as we have noted, a convention; the mixture of these two coloured lights does not result in white, but rather in "light", or perhaps gray. There is, however, a way of obtaining green by mixing lights: shining "white" light, successively, through a yellow filter and then a blue filter will result in a green.[33]

Newton also maintained that sunlight is compounded from all of the primaries, though he was forced over time to concede that various groupings with as few as three

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[32] On this point, see: Allan E. Shapiro, "The Evolving Structure of Newton's Theory of White Light and Colour," *Isis* 71, 1980, 211- 235, 235, n. 77.

[33] Robert Boyle related nine different ways of mixing yellow and blue; green always resulted from the mixtures. Robert Boyle, *Experiments and Considerations Touching Colours*, London, 1664; New York, 1964, 233-36. For an elaboration of criticisms levelled by contemporaries of Newton on this point, see: Alan Shapiro, "Evolving Structure," 223-225.

colours could combine to make white light.[34] This fact, which as we see below, is implicit in one of Newton's graphic representations of colour relationships; it was an invitation to later three-colour theorists.

In his comprehensive speculations on every aspect of colour physics, Newton actively sought, as had others before him, and as we noted in his *Definition* , analogous phenomena in the physics of sound and music.[35] Newton suggests in the *Opticks* that light rays move through the air just as sound waves do: "the Vibrations of the Air, according to their several bignesses, excite sensations of several sounds." Moreover, we recall that he writes, "Rays,to speak properly, are not coloured. In them there is nothing else than a certain Power and Disposition to stir up a Sensation of this or that Colour," much as "the sound in a Bell or musical String, or other sounding body, is nothing but a trembling of Motion."[36] This analogy between colours and harmony has a long history; in fact, it can be traced back to Aristotle. The re- assertion by Newton of this idea, which is not otherwise justified in the *Opticks* , is a continuing mystery to physicists; indeed, the statement has come to be considered as notorious by later scientists. But, the claim for the analogous properties of colours and music allowed Newton to apply to colour, very neatly, accepted ideas about musical scales as well. As A. Rupert Hall has pointed out, the parallels provided Newton with a convenient rationale insofar as he was thus enabled to choose precise fractions for the limits of the colours in the spectrum.[37] We remind

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[34] A. Shapiro, "Evolving Structure," 223ff.; see also M. Kemp, *The Science of Art* , 285-286, for this point, as well as for a similar account to the one I have given of the problems inherent in Newton's theories.

[35] See Martin Kemp, *Science of Art* , 286.

[36] Isaac Newton, *Opticks* , 345 and 124-125. See also Martin Kemp, *Science of Art* , 286.

[37] A. Rupert Hall, *All Was Light: An Introduction to Newton's 'Opticks'*, Oxford, 1993, 112-113.

ourselves here that this is a polite fiction because, in actual fact, exact determinations are impossible, for as we have noted, colour is a continuum.

Newton presented the relationship between music and colours graphically (Prop. III, Prob. I) (Fig. 2). In the illustration, we see that the spectrum is divided according to the ('just diatonic') musical scale. The successive intervals are assigned values: 1, 8/9, 5/6, 3/4, 2/3, 3/5, 9/16 and1/2. Thus, the violet, indigo, blue, green, yellow, orange and red spaces are given lengths of 80, 40, 60, 48, 27 and 45 units respectively. Each unit equals 1/360th of the length of the spectrum.

We can see that Newton developed this analogy between colour and music along strictly mathematical lines. However, some of his decisions, such as the number of primaries, were made as much for aesthetic reasons as for scientific ones. His *Optical Lectures* reveal that though he first used a five-colour scheme for his primaries: red, yellow, green, blue, purple, this did not satisfy his sensibilities: "in order to divide the image into parts more elegantly proportioned to one another, it is appropriate to admit to the 5 more prominent colours two others, namely, orange, between red and yellow, and indigo between blue and violet . . . everything turns out proportionate to the quantity of green with a more refined symmetry . . . everything appeared just as if parts of the image occupied by the colours were proportional to a string divided so it would cause the individual degrees of the octave to sound."[38] We can, of course, see quite clearly the self-reflexive nature of the argument; to wit, the focus changes from the object to the means of inquiry; once established, there follows a concomitant inversion of object and means.[39]

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[38] *The Optical Papers of Isaac Newton*, vol. 1, *The Optical Lectures, 1670-1672*, ed. A. Shapiro, Cambridge, 1984, 50, n. 10, and 543. See also citation in M. Kemp, *Science of Art*, 286.

[39] For a particularly illuminating discussion of this kind of reasoning in the context of art history, see: E. Wind, "Some Points of Contact between History and Natural Science," *Philosophy and History: Essays presented to Ernst Cassirer*, eds. R. Klibansky, H.J. Paton., Oxford, 1936, 255-264.

Newton also designed another, more familiar, graphic scheme to show the relationships of colours: he joined the ends of the spectral band so forming it into a circle (Prop. VI, Prob. II) (Fig. 3). He assigned each colour a proportion of the circumference matching its position in a musical scale: thus red-orange-yellow-green-blue-indigo-violet was equivalent to sol-la-fa-sol-la- mi-fa-sol which further corresponds to 1/9-1/16-1/10-1/9-1/16-1/16-1/9. The successive circumferential spaces now have the proportional lengths (red) 80, 45, 72, 80, 45, 45, 80 (violet). Newton does not explain the discrepancy.[40]

The point of the colour circle was that it allowed Newton to represent, diagrammatically, the intensities, as well as the hues, of colours. In addition, it is the pictorial expression of Newton's rule for colour mixing. It is also relatively simple and straight forward.

As described above, the circumference of a circle was divided by Newton in a particular harmonic proportion; each of the resultant arcs represents one of the seven primaries. The centre of gravity of each of these arcs is noted. Each of the determined points is circumscribed with a small circle whose size corresponds to the proportion of the number of rays of that sort in the mixture under consideration. The common centre of gravity Z of all the small circles represents the resultant mixture "accurate enough for practise," as Newton says, "though not mathematically accurate."[41] The centre of the circle O represents white; the hues on the circumference are *pure* in that they contain no white. The centre of gravity of the seven colours, mixed in proportion, falls at O. However, there is a *caveat*. Newton writes:

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[40] Isaac Newton, *Opticks*, 154; Martin Kemp, *Science of Art*, 286; A. Rupert Hall, *All Was Light*, 115-116.

[41] Isaac Newton, *Opticks*, 117.

> . . . if only two of the primary Colours which in the Circle are opposite to one another be mixed in an equal proportion, the point Z shall fall upon the centre O, and yet the colour compounded of those two shall not be perfectly white, but some faint anonymous Colour. For I could never yet by mixing only two primary Colours produce a perfect white. Whether it may be compounded of a mixture of three taken at equal distances in the circumference I do not know, but of four or five I do not question but it may. But these are curiosities of little or no moment to the understanding the Phaenomena of nature. For in all whites produced by nature, there uses to be a mixture of all sorts of rays, and by consequence a composition of all Colours.[42]

This circular diagram of colour relationships, "accurate enough for practise," (though one is hard pressed to understand how the rays in any colour can be determined empirically) was and continues to be enormously influential. The colour mixing rule embodied in the chart was, in the nineteenth-century, the foundation for the work of Thomas Young, David Brewster, James Maxwell and Hermann von Helmholtz in establishing a trichromatic theory of colour vision.

With the help of Newton's diagram, and its variations and derivatives, it became possible adequately to predict mixtures and to describe those mixtures in terms of the chosen primaries and white. This is, of course, a useful aid to artists, and as a consequence, most art students, at some point in their training, are asked to paint colour wheels in the belief that in so doing they will learn, in a practical way, what they need to know about colour and colour mixture.

Newton, it must be emphasized, in no way intended a colour wheel for painters. However, his diagram provides a model that can be adapted easily to this end. Ironically, the Newton circle's use as a model and artists' attempts to reconcile practical painting experience with it resulted in confusion.

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[42] Isaac Newton, *Opticks*, 116; cited and discussed by Alan F. Shapiro, "Evolving Structure," 235.

For example, artists have known for centuries - long before Newton - that the three so-called primary pigments, red, yellow and blue, can be mixed to yield any desired hue. However, the authority, in the face of evidence and experience to the contrary, exerted by Newton's assertion that there are seven primaries, rather than three, clouded interpretations of colour phenomena. I examine, briefly, this dilemma below. But, before embarking on a review of these difficulties, it is perhaps appropriate, at this point, to identify a problem that comes to light when Newton's schema are considered as a pair.

As we have seen, Newton designed two diagrams that purport to show the relationships of colours. The linear one is employed when colour is thought of in terms of light waves. We recall, once again, illustrations in introductory physics texts that show the bands of hues arranged in a ribbon that is meant as a chart of the visible part of the electromagnetic spectrum. The circular diagram, on the other hand, is used when colour is considered as a percept or a visible phenomenon. Unfortunately, as Sloane has also observed, the two diagrams are not compatible, and in fact draw attention to the inconsistencies in our thinking about colour.[43] Moreover, if the relationship between the hues is correctly illustrated by one diagram, it cannot be correctly shown by the other.

Newton's original linear arrangement has, in its essence, remained unmodified to the present day in part because its symmetry and its strict mathematical rigour presuppose an underlying order to the nature of things. The attraction of - even, the insistence upon - the existence of a mathematically based arrangement of the universe has led to inconsistencies and illogicalities.

Newton's linear diagram is based on the assumption that variation in colour in the spectrum can be correlated with variations in the wavelength of light. Light, the only visible part of the whole electromagnetic spectrum, occupies only a very short length of the

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[43] Patricia Sloane, *Visual Nature* , 79.

scale (wavelengths ranging from 380 to 780 millimicrons in length). This visible segment is flanked at its red limit by infrared radiation and at its violet end by ultraviolet. In short, in electromagnetic theory, visible light is a section of a "longer" scale, which can be properly shown in a linear way.

Newton joined the ends of the linear scale and created the familiar colour circle or wheel. Its arrangement is dictated by visual experience; in the circle we see the inclusion of a range of colours between red and violet, ıich, of course, are a familiar part of everyday visual experience.

These colours, however, are not included in the linear scheme, which leaves them - the purples - in an ambiguous position. We are, in effect, presented with a range of colours that have not been, and, in fact, cannot be, incorporated into the electromagnetic theory, a cornerstone of classical physics, which assumes a comprehensive order to nature. Furthermore, it would appear that these colours were excluded, in spite of the evidence presented by human vision, so that a certain idea of order in the relationship between hues could be preserved. In this instance, theory, very obviously, does not match nor reflect what we see and observe to be true.

Mathematical conceptions of order are powerful in their appeal and continue to influence, even predominate, the natural sciences. Colour theorists could not help but to have been, and continue to be, influenced as well. As a result, the belief in mathematically regular measure as a key to understanding colour is an underlying assumption in currently subscribed-to colour theories.

Implicit in this search for order is perhaps an unarticulated wish to define what is harmonious, and, even, what is beautiful. Perhaps an indication of this can be recognised in the appreciation of, even importance accorded to, "*elegance* " by scientists and mathematicians when they formulate theories about, and solutions to, the problems they

have set themselves. As a corollary, if beauty and any of its manifestations, such as colour harmony, could be shown to be rational, they would gain immeasurably in stature because they would then have been endowed with the weighty, somehow moral, authority granted to the members of an august *natural* order.

The study of colour harmonies seems to have been particularly singled out by colour theorists at the turn of this century as a vehicle for determining order in the arts. Some of these ideas are discussed more fully below. It is worth noting, however, that other areas of the arts were not immune to these types of ministrations; one need only think of Jay Hambidge's books on *dynamic symmetry* which attempt to establish rules for beautiful proportions based on measurements of the Parthenon.[44] We still live, for better or worse, with the legacy of such ideas, which, with their often overt, or at the very least, implicit, prescriptions for the "proper," even "correct," way to proceed should one want to achieve something that is aesthetically pleasing.

There are numerous colour diagrams, both from this century and earlier, that seek to make graphic and easily comprehensible an underlying order to colour and its harmony. In each instance, the existence of a set of primaries is implicitly understood and accepted, *a priori*, as a guiding principle. These primary colours are the foundation from which all colour mixtures are derived. The positions, in a diagram, of the primaries and the mixed colours are determined geometrically or mathematically. By inversion, the order and logic inherent in geometry and mathematics are applied to the colour mixtures; thus, the evaluation of a group of colours as harmonious or not, can claim as a rationale, no matter how illusory, the rigor and stringency demanded of scientific reasoning.

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[44] Jay Hambidge is the author of a number of books on this subject. See, for instance: *The Parthenon and other Greek Temples; their Dynamic Symmetry*, New Haven, 1924; *Dynamic Symmetry in Composition as used by the Artists* ,New York, 1923; *Dynamic Symmetry: The Greek Vase*, New Haven, 1920; *The Elements of Dynamic Symmetry*, New York, 1926.

It is usually assumed, in traditional teaching, that there are six basic colour relationships or *schemes* that can be used to create harmonies. These are as follows:

1. *Monochromatic*. A one-hue scheme that uses one hue plus black and white. At root, the variations are all based on differing degrees of luminance or of purity, or of both.

2. *Analogous*. These hues are next to each other on a colour circle.

3. *Complementary*. Schemes based on hues directly opposite each other in a colour circle.

4. *Split-complementary*. A combination of a given hue and and the two hues on either side of its complement.

5. *Triad*. Three hues selected so that they form an equilateral triangle on the colour circle.

6. *Tetrad*. Four hues equidistant from one another on the colour circle, thus a square. A variation might be a rectangle, like the one created by a "double-split-complementary" scheme.

Martin Kemp in his *The Science of Art* , and Charles Parkhurst and Robert L. Feller in their article, "Who Invented the Color Wheel?," reproduce examples of some of the numerous pre-twentieth century colour diagrams that were at one time and, in some instances, continue to be influential. Examples of the latter are to be found in the illustration of James Clerk Maxwell's colour triangle (1860) and its precursor, the triangle designed by Tobias Mayer (1758). There are also reproductions of other triangles and circles, including those designed by Goethe (1810), Moses Harris (1766) and Louis Bertrand Castel (1740). Also illustrated are various solids: the pyramid conceived by J.H. Lambert (1772); the double pyramid diagrammed by A. Hoefler (1905); the cone and the double cone by Wilhelm von Bezold (1876) and Ogden Rood (1879) respectively; the hemisphere by M.E. Chevreul (1839); and, among others, the sphere developed by Philip Otto Runge (1810).

As indicated above, Newton's tenets are at odds with the colour practices of artists. However, later theorists, insofar as they considered artistic practice at all, did endeavour to accommodate or reconcile artists' traditional knowledge with the scientific theory.

One early attempt to use Newtonian ideas in art theory can be seen in a brief essay composed by Brook Taylor in 1719.[45] Taylor, as he writes about colour, distinguishes between "hue" and "strength of light and shadow." His primaries are those established by Newton. Taylor arranges these, and their mixtures, in a wheel that progresses towards white at its centre. Ideally, this circle, if applied to practice, should provide the painter with perfect results. Unfortunately, as Taylor admits, the impurities and peculiarities of the materials often cause unpredictable behaviour. Taylor ends his study with the warning that dealing with these oddities is best left to those practised in the art.[46]

In a similar way, Martin Kemp, writing in the 1990's, also illustrates, by example, the problems caused by Newton's theory with references to passages in Francesco Algarotti's *Essay on Painting* of 1764.[47] Algarotti writes that "every undivided ray, let it be ever so fine, is a little bundle of red, orange, yellow, green, azure, indigo, and violet rays, which, while combined, are not to be distinguished from another, and form that kind of light called white; so that white is not a colour *per se* , as the learned da Vinci (so far, it seems, the precursor of Newton) expressly affirms, but an assemblage of colours." He continues, although "Titian, Correggio, and Van Dyke [sic], have been excellent colourists,

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[45] Brook Taylor, "A New Theory for mixing of Colours taken from Sir Isaac Newton's *Opticks* ," *New Principles of Linear Perspective*, London, 1719, Appendix II, 67-70. See also, Martin Kemp, *Science of Art*, 286-287.

[46] Excerpts from Taylor's essay are included in Martin Kemp, *Science of Art*, 287.

[47] Martin Kemp, *Science of Art*, 287.

without knowing anything of these subtleties, that is no reason why others should neglect them."[48]

Algarotti's advice is significant. It is another example of the kind of thinking produced by unconscious advocacy. He exhorts artists to become conversant in (Newtonian) colour theory; yet, he admits that Titian, Correggio and van Dyck were excellent colourists, even though they were unaware of the theory. Algarotti thus implies, through his hindsight, that the earlier artists benefitted from Newton's theory without knowing that they were doing so.

In addition, Algarotti's comments, in that they mention Anthony van Dyck and colour theory, are perhaps serendipitous in the context of this essay. Van Dyck was a student and an assistant to Rubens for almost the whole decade preceding the young artist's departure for Italy in 1621. He would undoubtedly have been aware of and benefitted from any colour theory that the master employed - particularly if one had been written down. There are two manuscripts that give insights to van Dyck's technique: The De Mayerne manuscript in the British Library; and, the Commonplace-book of Dr. Thomas Marshall in the Bodleian Library, Oxford. Neither of these sources indicates that van Dyck had a colour theory; however, the painting practices outlined therein correspond to those of Rubens.(See below.)[49]

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[48] Francesco Algarotti, *Essay on Painting*, London, 1764.

[49] For a description of the De Mayerne ms., see, M.K. Talley, *Portrait Painting in England: Studies in the Technical Literature before 1700*, London, 1981, 72-149. For the Dr. Thomas Marshall commonplace book, which contains a four page ms. attributed to van Dyck ("Observations of Ant. . . Dykii"), see M.K. Talley, *Portrait Painting* , 150-155. See also C. Christensen, M. Palmer, M. Swicklik, "Van Dyck's Painting Technique, His Writings and Three Paintings in the National Gallery of Art," in A.J. Wheelock, S.J. Barnes *et al* , *Anthony van Dyck.* Exhibition catalogue. Washington, 1991, 45-52. See in the same catalogue, S.J. Barnes, "The Young Van Dyck and Rubens," 17-26.

Algarotti's statements are also diversionary. Neither Algarotti, nor Taylor, for that matter, addresses the problem called forth by the conflict between the differing numbers of primaries used by artists and by Newton, respectively. Actually, all subsequent eighteenth-century reviews of Newton's theory leave this issue unresolved.

As we see below, a number of writers hoped to establish some sort of congruency between the colour principles traditionally used in painting and Newton's ideas by adapting Newton's colour wheel. Indeed, during its evolution, the circle was turned into a solid so that tonal gradation could be represented by the third dimension. In addition to circular patterns, triangular and pyramidal shapes and forms were also tried. Implicit in the development of all of the types is the Newtonian premise that colour relationships can be expressed by a closed geometrical figure.[50]

Louis Bertrand Castel was a pioneer in the development of the colour wheel. He was also polemically anti-Newtonian in outlook. As a consequence, he preferred to concentrate his efforts, as he says, "above all on the material and normal colours of painters."[51] In other words, Castel took his cue from artists' practices. Thus, he chose as his basic colours red, yellow and blue, to which he added black and white. He did try to reconcile Newton's ideas with those of painters. He claimed that the former's seven colours were the result of mixtures of the three primaries; these mixtures occurred as the colours emerged from the prism (Fig 4). Castel's illustration, shows that his circle is made up of twelve colours: red, yellow, blue; their intermediates; and six further mixtures. It is not symmetrical in its arrangement since the colours between the base colours vary in number. Castel also distinguishes between hue and tone, and divides the tones between

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[50] Martin Kemp, *Science of Art*, 287.

[51] L.B. Castel, *L'Optique des couleurs*, Paris, 1740, 2, cited as well in Martin Kemp, *Science of Art* , 287. For further reading, see: D.S. Schier, *Louis Bertrand Castel, Anti-Newtonian Scientist*, Cedar Rapids, Iowa, 1941.

black and white into twelve steps. Thus hues and tones, when co-ordinated, result in a set comprising one-hundred-and-forty-four members. This number is expanded by a series of mathematically determined mixtures to give a total of six hundred and fifty tints and shades.

Castel's ideas were elaborated by Tobias Mayer, a German scientist and engineer, in the 1750's.[52] Mayer also adopted the painters' primaries; he arranged these in an equilateral triangle whose vertices are separated by twelve divisions corresponding to twelve intermediate mixtures (Fig. 5). Thus, his basic triangle comprises ninety-one mixtures of the primaries. Each primary could also be heightened to white in twelve steps and darkened to black in just as many. The charts, when assembled, form a double- ended pyramid containing a total of 819 colours.

The essentials of Mayer's system were published independently, and in an abbreviated form, by J.H. Lambert in 1772 (Fig. 6).[53] Lambert and Mayer had each taken an important step in the graphic representation of colour and tone by starting with and using colours familiar to studio practice.

At about the same time that Lambert's work appeared, Moses Harris, an entomologist, issued his *The Natural System of Colours* (London, 1766?). It contains a colour circle based on the painters' primaries (Fig. 7). Harris' version is more symmetrical than Castels'; he arranges the base colours at three equidistant points on the circumference. The arcs between red, yellow and blue are each given over to five intermediate mixtures for a total of eighteen. Each of the eighteen hues are graded radially to white in twenty steps,

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[52] Mayer's ideas were published, in part, in: Tobias Mayer, *De Affinitate colorum commentatio*, Göttingen, 1758; and, "Die Mayerschen Farbendreiecke," *Göttingesche Anzeigen* II ,1758. They were not published in full until 1775. See, E. Forbes, *Tobias Mayer (1723-62): Pioneer of Enlightened Science in Germany*, Göttingen, 1980. See also, Martin Kemp, *Science of Colour*, 290.

[53] J.H. Lambert, *Beschreibung einer mit dem Calauschen Wäsche ausgemalten Farbenpyramide*, Berlin, 1772.

for a total of 360 tints. Harris designed a second wheel using orange, green and purple; this one was divided into 300 possible tints.

If we pause now and attempt to assess the contributions of these eighteenth-century scientists, Castel, Mayer, Lambert and Harris, we might easily conclude that their importance lies in having brought post-Newtonian colour science within the reach of professional painters. After all, artists, for the most part, untrained in the complexities of higher mathematics and classical physics, were not, as a group, well situated to understand ideas that even Newton's professional colleagues were hard-pressed to comprehend. A close scrutiny of the writings and diagrams of Castel *et al* cannot confirm that the work was actually helpful to practising artists. Upon reflection, we see that the fundamental problem of the relationship between *lights* and *pigments* remains unresolved. In addition, the question of the number of primaries - three or seven - is ignored. All of the diagrams, as we have seen, are based on three. We must therefore ask ourselves what *was* achieved. If we remember that Newton invented the colour wheel; and, if we also remind ourselves of that circle's underlying premise: the assumption that colour, and its relationships, can be explained by a closed geometric figure, we begin to understand. The writers, having accepted whole-heartedly the idea that colour relationships can be expressed graphically, have each devised a scheme that illustrates, in a seemingly logical and lucid way, what, in essence, was the common knowledge of artists. The achievement, because it is in each instance an incomplete illustration of known possibilities, is hollow, even illusory. In short, descriptions of phenomena are not explanations.

Artists' reactions to Newtonian theory ran the gamut from wholehearted acceptance to dismissal as irrelevant. For instance, William Hogarth, who was conversant with Newton's writings, either directly, or through the agency of Brook Taylor, may be numbered among the latter. He writes, with what may be described as a tone of finality: "There are but three original colours in painting besides black and white, viz. red, yellow

and blue. Green, and purple are compounded; the first of blue and yellow, the latter of red and blue; however, these compounds being so distinctly different from the original colours, we will rank them as such."[54]

Fresh complications arose around the turn of the nineteenth-century with the invention of new kinds of three-colour theories. These developments can be followed in the writings of Thomas Young, David Brewster, Hermann von Helmholtz and James Clerk Maxwell.

Thomas Young (1773-1829) was responsible for many discoveries in natural philosophy and physiological optics.[55] It was between 1791 and 1801 that he published most of his experiments and theories in physiological optics. And, it was in 1801 that he suggested that the retina of the human eye responded to colours in terms of variable amounts of three principal colours. He justifies this proposal with the statement: ". . . it is probable that the motion of the retina is rather of a vibratory than an undulatory nature . . . . Now as it is almost impossible to conceive each sensitive point of the retina to contain an infinite number of particles, each capable of vibrating in consonance with every possible undulation, it becomes necessary to suppose the number limited, for instance, to the three principal colours, red, yellow and blue . . . ."[56] In 1807, he reiterated this hypothesis, with different primaries: "It is certain that the perfect sensations of yellow and blue are produced, respectively, by mixtures of red and green and of green and violet light, and there is reason to suspect that those sensations are always compounded of the separate

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[54] William Hogarth, *The Analysis of Beauty*, ed. J. Burke, London,1753; Oxford, 1955, 127. For a description of artistic reactions, see, Martin Kemp, *Science of Artt*, 292ff.

[55] For a biographical synopsis, see: Edgar W. Morse, "Thomas Young," *Dictionary of Scientific Biography*, ed. Charles C. Gillespie, New York, 1981, vol. 13-14, 562-572.

[56] Thomas Young, "On the Theory of Light and Colours," *Miscellaneous Works of the Late Thomas Young, M.D., F.R.C.S.*, ... , eds. George Peacock, John Leitch, 3 vols., London, 1855, I, 146,147.

sensations combined; at least, this supposition simplifies the theory of colours: it may, therefore, be adopted with advantage, until it is found inconsistent with any of the phenomena."[57]

Young published no more on tri-colour vision. His ideas were modified and developed, as is discussed below, by Maxwell and von Helmholtz into the Young-Helmholtz theory of colour sensation.

David Brewster (1781-1868) was a scientific writer and experimenter.[58] He entered the debate over the number of colours in the spectrum; whether there were seven or some other number. Brewster experimented; he examined the solar spectrum with various coloured glasses. By 1831, his findings had led him to conclusions not unlike those of Castel. He was persuaded, as he says, that the entire spectrum "consists of three spectra of equal length, beginning and terminating at the same points, viz. a red spectrum, a yellow spectrum, and a blue spectrum."[59] In essence, Brewster seems to have provided a fully-scientific argument, based on experimentation, for an alternative to the Newtonian system. Moreover, he was interested in art and was notorious for appearing at exhibitions with viewing instruments of his own devising with which he proceeded to analyse the works on view. He accused painters of a general ignorance of the principles of colouring.[60] Upon reflection, such a statement seems particularly bizarre, because traditional painting methods, one would think, cannot help but coincide with Brewster's ideas, since both are based on the same colours.

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[57] Thomas Young, *A Course of Lectures on Natural Philosophy and the Mechanical Arts*, 2 vols., London, 1807; New York, 1971, I, 439.

[58] For a biographical overview, see: Edgar W. Morse, "David Brewster," *Dictionary of Scientific Biography*, ed. Charles C. Gillespie, New York, 1981, vol. 1-2, 451-454.

[59] Edgar W. Morse, "David Brewster," 453.

[60] Martin Kemp, *Science of Art*, 300-301.

Hermann von Helmholtz (1821-1894) exerted incalculable influence on nineteenth-century science. His successes were in large measure due to an undeviating reliance on mathematics and mechanism. His mathematical expertise allowed him to develop imposing theoretical concepts, particularly in the field of physiology.[61] His ideas about physiological optics are the ones that are pertinent in this instance.

He turned to the problem of colour vision in 1852 with an attack on David Brewster. He regarded Brewster's theory as confused, and argued that his experiments, which Brewster claimed as verification of his ideas, were flawed and had actually led Brewster astray. Helmholtz carried out his own studies. He found, to his surprise, that a mixture of blue and yellow lights yielded a green-tinted white, although a blend of blue and yellow pigments results in a green. From these findings, Helmholtz elaborated the distinction between additive and subtractive colour mixtures. This he announced in 1852. In the same year, Helmholtz revived Thomas Young's theory in order to refute it. He had found, through experimentation, that mixtures of spectral colours appeared dull in comparison to the originals. On these grounds, he assumed that the idea that all colours may be created by mixtures of only three, was incorrect. In other words, if Young's primaries are assumed to be red, green and violet, then the theory cannot explain how the remaining spectral colours can be seen so vividly. Although Helmholtz at first dismissed Young's theory, by 1858, he had changed his mind and had, in fact, become its leading advocate. Helmholtz incorporated all of his conclusions into his truly massive, three volume, *Handbuch der physiologischen Optik* (Leipzig, 1856-1867). This work encompassed all previous research in the field.

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[61] For a scientific biography, see: R Steven Turner, "Hermann von Helmholtz," *Dictionary of Scientific Biography*, ed. Charles C. Gillespie, New York, 1981, vol. 5-6, 241-253.

James Clerk Maxwell (1831-1879) was another towering figure in nineteenth-century science. His place in the history of physics is assured by his revolutionary work in electromagnetism and the kinetic theory of gases. His endeavours were not limited to these fora; he also contributed to many other fields, not least of which are those of colour vision and geometrical optics.[62]

Maxwell began his research into colour mixing in 1849, at the Edinburgh Academy, under the tutelage of James David Forbes. The two men experimented with coloured papers and tiles which they used to cover sectors of a disk. Once the colours had been affixed, the disks were then rapidly spun. The first experiment was aimed at replicating the known phenomenon that a spectral series can be used to produce a gray. Next, Forbes tried to produce a gray from combinations of red, yellow and blue, but this was not successful. The reason for the failure, he found to be the fact, "that blue and yellow do not make green, but a pinkish tint, when neither prevails in the combination."[63]

Maxwell and Forbes continued their experiments with the spinning tops; however, they employed red, blue and *green* to obtain their quantitative results. The standard rules for mixing pigments were explained by Maxwell, just as they had been, independently, elucidated by Helmholtz. Both concluded that that pigments acted as filters to light reflected from an underlying surface.

It is worth noting here that, as implied above, Helmholtz is usually given the credit for the revival of Young's ideas. However, this idea cannot really be the case since it seems that Helmholtz's conclusions were formulated after Maxwell's.

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[62] A brief scientific biography can be found in: C.W.F. Everitt, *Dictionary of Scientific Biography*, ed. Charles C. Gillespie, New York, 1981, vol. 9-10, 199-230.

[63] James Clerk Maxwell, *The Scientific Papers of James Clerk Maxwell*, 2 vols., ed. W.D. Niven, Cambridge, 1890; New York, 1952, I, 146.

Maxwell continued his work with the "Maxwell disks." He went on to prove that Newton's colour circle, with its white centre, satisfies the three-receptor theory. He designed his own diagram: a triangle with red, blue and green at the vertices and a white at the centre. The spectral colours were found to fall near the outside perimeter in a fashion that approximates Newton's circle.

When we review the ideas of Young, Brewster, von Helmholtz and Maxwell, with the eyes of an artist, we are, at best, only partially satisfied. It is true that, through the work of these investigators, the traditional painters' primaries are explained. Indeed, they were even elucidated in terms of Newtonian colour theory. However, it appears that these results were, in essence, only possible by default. This is to say that the artist's primaries could be accomodated to Newton's circle only when a distinction had been made between *additive* and *subtractive* mixing. Thus, even though the artists' primaries were made a special case (indeed, perhaps because they were) nothing new of practical import to their use and application, ensued. In short, artists continued to work in accordance with, and with sensitivity to, the dictates of their materials just as they always had done.

This is not, for one moment, meant to deny the importance of the *optical* advice inherent in nineteenth-century theory to painters ranging from Delacroix to those associated with the Impressionists and Neo-Impressionists; this influence continues to this day. In this context, the influence of physical colour theory was, and continues to be, profound, particularly in the areas of complementarity, simultaneous contrast and successive contrast. However, a discussion of the topic is not within the bounds of this essay, except peripherally.

One early nineteenth-century artist, Philipp Otto Runge, is within our purview because his ideas, through his interpreters, have influenced popular conceptions of colour in this century.

In 1810, the year of his death, Runge published his book: *Die Farbenkugel, oder Construction der Verhältnisse aller Mischungen der Farben zu einander, und ihrer vollständigen Affinität* (Hamburg, 1810). It is the product of half a decade of study that sought to ally (Newtonian) theory and practice.

Runge also expressed his ideas graphically; he designed the first colour sphere (Fig. 8). He arranged his colours: red, yellow and blue; green, orange and purple; and six intermediates, around the equator. At the poles he placed black and white. Between the polar points and each saturated equatorial hue, he situated the various compound mixtures of grays (values) and hue. The central polar axis is a gray scale; a middle gray is at the core of the globe.

The overall plan is reminiscent of Castel's conception. Runge, however, was not anti-Newton. Indeed, he tried to reconcile his ideas with those of the physicist: he attempted to match his six colours to Newton's seven, by the simple expedient of dividing his violet into a blue and a red component. Thus, he established a series of seven colours which he arranged in a horizontal strip. However, he includes only six colours in the sphere. As we remarked above, this kind of manipulation leads to incompatible results.

Runge's six colours - the primaries and the secondaries - and their arrangement provided the artist with what he considered a sound basis for judging colour harmonies, either in pairs or in larger sets. For instance, complementary pairs resulted in pleasing contrasting harmonies; pairs of primaries were discordant. The discordancy of each pair could be manipulated to different effect by inserting a gray, the third primary, or the relevant secondary colour between the pair.[64] One recognises clearly the role that positioning on the sphere, that is to say geometry and arithmetic, can play in the decisions about colour harmony.

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[64] Martin Kemp, *Science of Art*, 295-296.

Runge's sphere, and his ideas, were adapted in the early part of this century by Albert H. Munsell and Wilhelm Ostwald. These latter two are chiefly responsible for the enduring popular conceptions of colour and colour harmony. The effects of their theories are so profound, and have become so embedded in current thinking about colour, that there is a very real tendency to see reflections, or to hear echoes, of their ideas and aims in earlier theories of colour. Indeed, it is difficult not to use these twentieth- century ideas as unspoken criteria of excellence in their goals, motives and effects, when examining earlier theories. One must be wary not to assign a twentieth-century view to an earlier context.

Ostwald and Munsell sought independently to provide for art and industry a simple and easily communicable way of identifying, codifying and measuring the appearances of pigment colours. Their physical and chemical constitution did not matter. Both men were successful in their undertakings - if popular reception is a measure of success.

Albert H. Munsell (1858-1918) published his book, *A Color Notation* in 1905. In it he outlines his system for regularizing the understanding of colour; more significantly, he provides rules for ensuring its tasteful use.

The Munsell system uses three variables or dimensions to identify a colour: Hue, Value (Lightness), and Chroma. These are arranged in a cylindrical co-ordinate system (Fig. 9). Hue is designated by combinations of letters representing five principal hues: red, yellow, green, blue and purple. There are also five intermediate hues; thus, the circle is composed of ten hues: R, RP, P, PB, B, BG, G, GY, Y, YR. Hues are designated by combinations of letters preceded by a digit between 1 and 10 to give a 100-step hue scale. Value is scaled with 0 at black and 10 at white. Chroma starts at 0 for neutral gray and extends to the limits of perception or the samples used. Chroma is measured in equal steps so that two chroma steps equal one value step. It is obvious from this description that, in practice, a Munsell notation is not very enlightening. As a consequence, the Munsell system is illustrated by a (very expensive) collection of approximately 1500 paint samples,

The Munsell Book of Color , published continuously by the Munsell Corporation. The Munsell system is also an integral part of a universal colour language. This system was adopted by the Inter-Society Color Council of the National Bureau of Standards of the United States of America. The standards institutions of other countries, for instance, the United Kingdom and Japan, have also subscribed to the system.

Wilhelm Ostwald (1853-1932) published a number of books on colour. The first, the *Farbenfibel* , which outlines his theory, was published in 1916.

Ostwald's colour wheel consists of a sequence of 24 hues divided into 8 groups of 3, named: yellow, orange, red, purple, blue, turquoise, seagreen and leafgreen. He also has a value scale: a standard white sample *a* is linked to a standard black *p* in 13 gray steps. The steps are judged *visually* to be equal in interval (Mixing progresses according to a geometrical scale rather than an arithmetical one.); in its complete version, the sequence is labelled from *b* to *o* ; it is usually abridged to 8 steps: *a, c, e, g, i, l, n* and *p* . When arranged three-dimensionally, each colour sample is located in a double cone; the colours are around the circumference, white is at the top, black is at the bottom.

A vertical cross-section of the double cone reveals a pair of triangular, complementary leaves (Fig. 10). Each triangle has a hue, black and white in a corner. A standard triangle incorporates 27 graded mixtures of colour, obtained by mixing black, white and an Ostwald hue. Colours are designated by a number followed by two lower-case letters; the number identifies the hue, the first letter establishes white content, the second indicates black content. As in the Munsell system, an alpha- numeric identification is not sufficient; samples are needed for matching colours.

Both systems are outwardly similar. Each incorporates a gray scale, ranging incrementally from black to white, and a hue circle comprising the major hues; these are arranged in a solid that is theoretically expandable to include the other colours. Each is also

accompanied by a book that displays the colours of the solid in printed form; indeed, as we have noted, each system depends on samples or swatches of colour for its standards. Both conceptions have regulated colour names, individual colour notations, and individual formulae for creating colour harmonies. However, each system employs its own parameters - Munsell uses hue, value and chroma; Ostwald uses black content, white content and hue content - with the result that the two schemes are incompatible.

Both men were entrepreneurs: Munsell founded the Munsell Color Company which still actively merchandises colour teaching materials and charts of standards; Ostwald's enterprise, called "Ostwald Energie," was equally successful insofar as it not only counselled German business and industry, but also saw its founder's concepts adopted by the German education authorities.

Ostwald's ideas were popularized in North America through the efforts of Egbert Jacobson and Faber Birren.

Jacobson is responsible for the publication of two books which helped disseminate Ostwald's theories: *The Color Harmony Manual and How to Use It* (Chicago, 1942), published under the auspices of the Container Corporation of America; and *Basic Color: An Interpretation of the Ostwald Color System* (Chicago, 1948). Using these books and the Ostwald system is a simple matter. Once one is familiar with the solid, one needs only to apply the formulae outlined by Ostwald to select sets of colour. The result, according to Ostwald, will always be harmonious. The underlying principle to the formulae is mathematical regularity in sequence and spacing.

Faber Birren, a colour consultant and founder of Faber Birren and Company, had a profound effect on North American ideas about colour. He was a prolific author on the subject, as well as an editor of the works of Michel-Eugène Chevreul, Moses Harris, Albert Munsell and Wilhelm Ostwald. His ideas were for a time (and to a certain extent

still are) profoundly influential. His conceptions of "functional colour" - his own coinage - resulted in the subdued "institutional" colours found on the walls of schools, institutions and government buildings all over North America in the 1940's and 1950's. For example, Birren suggests "pale yellow, pink and peach" for elementary schools; the more intellectual climate of high schools call for cool green, blue and gray. As well, Birren advises that, for the classroom, "the two best hues have been found to be pale blue-green and peach."[65] At one time or another, Birren was engaged by the U.S. Army, the U.S. Navy, the U.S. Coast Guard and the State Department.

The theories of Munsell and Ostwald, aided by the efforts of Birren and Jacobson, and despite their questionable and vague aesthetics, are still thriving in popular conceptions of colour; most of what is taught in art schools to this day is based on their ideas. Both systems advocate the philosophy that order is a necessary prerequisite for beauty; and that, further, harmony is a sign of order.

The equation, Harmony = Order = Beauty, allows for a number of conclusions. For example, if a composition is harmonious, it must be ordered; or, if it is beautiful, it must be ordered as well, and so on. The next step in this line of reasoning is to assume that if the work of art fulfills the criteria of harmony, beauty and order, it must also be congruent with a theory, i.e. Munsell's, Ostwald's, or some other deemed appropriate.

Jacobson employed this line of reasoning when he analysed a group of twelve paintings according to the principles of the Ostwald system. He found that "the great painters have long used, and that Ostwald has at last accurately described the fundamental principles of harmony." [66] This, as Sloane has also pointed out, is an example of the

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[65] Cited in Patricia Sloane, *Visual Nature*, 279. For elaboration of his influence see *ibid*, 276-280. Some of Birren's publications are listed in my bibliography.

[66] Egbert Jacobson, *Basic Color*157. The list of paintings comprised works by Giotto, Picasso (2), El Greco, Rousseau, Botticelli, Vermeer, van Gogh, Matisse, Gauguin,

unconscious advocate argument, a variation on argument by appeal to authority.[67] This type of reasoning, which we have encountered before, holds that a theory can be given validity by showing its association with, or relevance for, an artist of the past, or for his or her work. The artist may have been unaware of any theoretical associations inherent in his or her work, or may even have denied such associations. It is a circular argument that manages to survive because it is self-referential. The theorist is always right; the artist may be wrong.

In the preceding brief sketch of the history of colour theory, we have seen how artists' practice - their use of basic colours, particularly, red, yellow and blue - were accomodated into nineteenth-century theories. Moreover, I have indicated how, along the way, the visual evidence manifest in artists' practical experience was alternately ignored by theorists or included in theoretical constructs only to the extent that it could be codified along Newtonian lines.

Unfortunately, even a cursory comparison of the colour results obtained from the mixtures of paints found on the artists' palettes with those predicted for the same mixtures by theorists is immediately disappointing. One is led to the conclusion that the theories - or more accurately, the theoretical descriptions - may, at root, represent idealizations of studio experiences.

This brief review of the evolution of the colour theory that is now generally accepted as correct is important for this study. The survey illustrates, by concrete example and by implication, how our prevailing views of colour, and, of course, those of contemporary scholars, have been formed. Further, we now see, through the example of Algarotti, how the *a priori* belief in the "correctness" of a theory, may unwittingly lead

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Renoir and Cézanne. See also Patricia Sloane, *Visual Nature* , 278, 331, n.4, for discussion and titles of the works.

[67] Patricia Sloane, *Visual Nature* , 278.

researchers to conclusions about its conscious application in artistic practice which are, at root, anachronistic. This weakness in reasoning is overlooked because the assumption of the "rightness" of the theory - viewing it as axiomatic - may lead to the self-reflexive justification that it must have been used because it alone is "right." We explore below how this type of thinking may have influenced scholars attempting to associate Rubens with a colour theory.

Artists' Techniques

The inherent shortcomings of colour theory become apparent immediately when the theory is applied to the technical problems of the painter. This can be illustrated easily by pointing out the inconsistencies between theory and practice that are revealed by an examination of some of the problems that are encountered whilst trying to mix a colour so apparently simple, and even mundane, as *brown* .

As is true of all colours, *brown* is difficult to define, or rather, accurately to describe verbally. Even the use of a colour sample or samples leaves much to be desired, because, basically, these are only choices of representative colours which are unique to an individual. Most people would probably agree that there exists a range of browns; there are yellowish-browns, reddish-browns, greenish-browns, even purplish-browns. Indeed, in their extent and variation, the browns seem to match the grays.

Dictionary definitions are somewhat more restrictive. The compilers of the *Oxford English Dictionary* understand *brown* as a composite colour resulting from the mixture of red, yellow and black. The American National Bureau of Standards has published a dictionary of colour names; it uses Munsell notation to "define" a colour.[68] *Brown* , in this dictionary, includes colours within a range that encompasses the following dimensions: Munsell hues from 2YR to 8YR; Munsell values are between 0 and 6.5, with a concentration between 2.5 and 4.5; Munsell chroma is also variable; the ratings are between 1 and 5 for a dark brown, and between 3 and 6 for a light brown. A moderate brown, according to the authors of this reference work, has a Munsell hue between 3YR and 8YR; a Munsell value between 2.5 and 4.5; and, a Munsell chroma between 2.5 and 5. Thus, they also regard brown as a mixture of red, yellow and black. Ironically, the OED

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[68] K.L. Kelly, Deane B. Judd, *Color: Universal Language and Dictionary of Color Names,* N.B.S. (U.S.) Special Publication 440, 1976.

definition is more enlightening, and useful, because its generalized description allows everyone to imagine a brown. The N.B.S. (U.S.) definition, despite its claim to accuracy, is not only self-referential, but also opaque to most of those of us who might care to know what has been "legislated" to be a moderate brown because it is self-reflexive.

Von Helmholtz identified brown as a low-value yellow (*lichtschwachem Gelb*).[69] This judgement has been widely accepted by researchers studying the psychology and physiology of vision.[70] In modern colorimetry, the issue of how brown is related to other colours has been interpreted on the basis of viewing brown as a supersaturated yellow. As Sloane has pointed out, the meaning of supersaturation, a chemical term, is unclear in the context of light rays.[71] In addition, visual evidence, as most of us have experienced, reveals that there are browns containing other hues besides yellow - most commonly, red and orange.

However, if we continue, for the moment, with the idea that brown, in the context of colour theory, is a darkened yellow, and then try to apply this theoretical principle to the practicalities of mixing pigments and paint, we might be surprised with the results.

Darkening - that is, adding black to - a yellow paint will not result in a brown, or indeed, in a colour that is convincing as a dark yellow. The mixture can best be described as an olive-green. The choice of yellow pigment matters very little: cadmium yellow, lemon

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[69] Hermann von Helmholtz, *Handbuch der physiologischen Optik* (1855-1866), 2 vols., 3rd ed., Berlin, 1911, vol. 2, 110. See also, Eckart Heimendahl, *Licht und Farbe* , 65.

[70] See, for instance, Ewald Hering, *Grundzüge zur Lehre vom Lichtsinn*, Berlin, 1920, 55. This work has been translated by L. Hurvich and Jameson: *Outlines of a Theory of Light Sense*, Cambridge,MA, 1964. Hering proposed the "Opponent Theory" of colour vision, which holds that colour vision rests on the opposition of colour pairs: red-green, blue-yellow and black-white. This was a challenge to the Young-Helmholtz Theory. It is now recognised to have merit. See, L. Hurvich, *Colour Vision*, Sunderland, MA, 1981.

[71] Patricia Sloane,*Visual Nature*, 86.

yellow, lead-tin yellow, even yellow ochres, when mixed with blacks, whether mineral or organic in origin, will display, not only a *value* shift, but also a *hue* shift towards green.

It is possible for painters to paint a sequential darkening of a yellow which will look "right" to most viewers. For instance, a nine-step scale of seemingly equally spaced values (for clarity let them be numbered from 1 to 9 [darkest]) of yellow can be created in the following way:

1. A good yellow to start with might be a Cadmium Yellow Medium. If used straight from the tube, one can assign it a value of 2 (in our scale).

2. To create value 1, add white. There might be a small hue shift; this can be corrected with a touch of orange (made from Cadmium Yellow Medium and Cadmium Red Light).

3. Values 3 and 4 can be made with mixtures of Cadmium Yellow Medium, Burnt Umber and Hansa Yellow Light.

4. Values 5 through 8 can also be created with mixtures of Burnt Umber and Cadmium Yellow Medium.

5. The final value 9 can utilise Burnt Umber from the tube. (The values between 5 and 9 may be refined with small touches of green.)

A somewhat simpler sequence may also be made from mixtures of Cadmium Yellow Medium, Yellow Ochre, Raw Sienna, Raw Umber and, perhaps, Burnt Umber.

Actually, these earth colours - ochres, oxides, siennas and umbers - provide the painter with a very useful palette of browns. Other brown pigments have been used in the past and in some instances continue to find applications: Van Dyke Brown (Cassel Earth, Cologne Earth), Asphaltum (Bitumen), Bistre, Sepia and Mummy. If any of these pigment browns are not suitable, the painter has the option of mixing others. The following combinations of modern pigments will all result in a brown: Cadmium Red, Cadmium Yellow and Cerulean Blue; Quinacrodine Violet , Lemon Yellow and Cerulean Blue;

Cadmium Yellow, Quinacrodine Violet and Ultramarine Blue; or, Cadmium Red, Cadmium Yellow and Ultramarine Blue. These are the accepted and usual ways of mixing a brown tone.

A striking feature of these recipes is that, nominally, they all call for the use of the subtractive primaries: red, yellow and blue. Theoretically, a mixture of the three should result in a black, as, indeed, it will if the proportions of each of the ingredients are adjusted accordingly. However, the black will usually display a decidedly blueish cast.

A particularly satisfying, neutral black can be made with a mixture of Burnt Sienna, Deep Madder (or Carmine) and Prussian Blue. A simpler mixture resulting in a "good" black is Burnt Umber and Ultramarine Blue. ("Good" in this case is a subjective evaluation. Mixed blacks are often richer in aspect than pigment blacks; the latter tend to look flat and dead.) If one adds this mixed black to white, the result is, of course, a gray, but one with useful and attractive painterly possibilities. If the artist lets one colour predominate in the black, the resulting gray can display a subtly hued tint or shade of that colour.

Learning to use reds, yellows and blues, not only to mix secondary and tertiary colours, but also to create browns, grays and blacks, is a fundamental component of the colour training of any painter. The need for expertise in mixing these colours becomes particularly acute if the artist hopes to mix skin tones or "carnations." Formulations for skin colours, particularly those found in Caucasian complexions, but not limited to these, begin with reds, yellows, blues and whites. The resultant mixed skin tones can then be modulated and refined with mixed, or earth pigment, browns and greens; or with tinted, mixed grays.

Rubens' Technique

For a superb illustration of the complete mastery of the craft of colour mixing, we need only turn to the painted works of Rubens. His understanding of colour and his supreme skill in execution and application are manifest in his carnations.

Flemish and Dutch painting practices of Rubens' time and immediately before, upon examination, reveal varying methods for re-creating skin tones. One often finds carnations that display, in general, a uniform modelling with subtle hue differentiations; these are determined by the lighting of the scene. The paints were applied to grounds that were, in the main, chalk-based. The use of chalk is significant; it insured a surface that was warm and luminous in aspect. This white ground was then often coloured brown, or gray, either by tinting the ground itself, or by covering it with a thin *imprimatura* .

The next step would then have been the application of many thin layers of paint; the local colour of the skin was usually decidedly pink or pinkish in tone. The highlights would have been distinguished with pale yellows; the shadows tended towards brown or gray. This basic formulation was, of course, open to variation and development.[72]

Emphases of hue, particularly of the reds, differed from one artist to another. Yellows were, in individual instances, lighter or darker in value; and grays, as deemed appropriate by the painters, tended either to a blue, or to a green. In addition, Italian

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[72] As mentioned in the introduction (note 3), a succinct overview, in the context of Rubens' technique, is given by Hugo von Sonnenburg, "Rubens. Gesammelten Aufsätze zur Technik," *Mitteilungen. Bayerische Staatsgemäldesammlungen, München* , vol. 3, Munich,1979, 35. Von Sonnenburg also discusses the technique of Rubens' teacher, Otto van Veen. Other discussions of Rubens' technique can be found in: Joyce Plesters,*"Samson and Delilah* , Rubens and the Art and Craft of Painting on Panel," *National Gallery Technical Bulletin,* 7, 1983, 30-49; C. Brown, A. Reeve, M.Wyld, "Rubens' *The Watering Place* ," *National Gallery Technical Bulletin* , 6, 1982, 27-39; R.D. Buck, R. Feller, B.Keisch, R.C. Callahan, "Rubens' *The Gerbier Family,*" *Studies in the History of Art, National Gallery of Art, Washington* , Washington, 1973; A. and P. Philippot, "La Descente de Croix de Rubens: Technique pictural et traitement," *Bulletin Institut Royal,* 7 (1963). See also the respective bibliographies for further references.

influences, particularly those of Tintoretto and Veronese, were also significant. Overall, the southern innovations resulted in more "colourful" carnations: a pronounced use of the different hues, higher values and richer, more vibrant saturations.[73]

As Gerhard Evers has pointed out, Rubens' skill and genius in painting is, in part, discernible in the virtuosity with which he used and modulated the values of these colours to create tonal, or chiaroscuro, compositions.[74]

The manner of painting skin tones which is associated with Rubens, has also been recognised in the work of Federigo Barocci. This painter, who may have influenced Rubens, developed his pink and yellow-orange carnations on a foundation modelled in grays. These grays, at times, had a distinct blue or green cast to them.[75]

A most important Italian influence on Rubens was the work of Titian. Upon examination, we see that Rubens, like the Italian master before him, often used pure reds and yellows placed beside each other, rather than blended or glazed, in his carnations.[76]

A précis of the descriptions of Rubens' technique, resulting from Hugo von Sonnenburg's technical examinations of two of the artist's works, provides specific examples of the manner in which Rubens created his carnations.[77]

The skin tones in the 1600/1601 *Judgement of Paris* (National Gallery, London) (Fig. 11) comprise luminous red and pink tones, yellow highlights, and greenish-blue

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[73] Hugo von Sonnenburg, "Gesammelte Aufsätze," 35.

[74] H.G. Evers, *Rubens*, Munich, 1942, 215-223.

[75] For Barocci's influence on Rubens, see: T. Hetzer, *Tizian: Geschichte seiner Farbe* , 211; M. Jaffé, *Rubens and Italy*, Ithaca, NY, 1977, 52.

[76] Hugo von Sonnenburg, "Gesammelte Aufsätze," 36. See also E. Panofsky, *Problems in Titian*, New York, 1969, 17ff.

[77] Hugo von Sonnenburg, "Gesammelte Aufsätze," 36-37.

shadows. All these colours are built up on a dark brown (sienna hued), transparent priming over a chalk ground. The greenish-blue shading is varied with a grayish-pink mid-tone which, in turn, is accented with touches of the greenish-blue. Some of the anatomical features of the figure - cheeks, elbows and the knee - are treated with a pure red. At times, the yellow of the highlights, the blue and the red are placed one beside the other. Indeed, a preference for red is a hallmark of Rubens' work.

This separate, *tachist* , use of the three colours is far more developed in Rubens' work than it is in Titian's. The distinct application ensured not only a purity of colour and an intense vitality in the work; it also allowed for a different way of creating the effects of three-dimensionality or plasticity.

Von Sonnenburg's analyses of the blue shadows have shown that, at times, their effect was achieved *optically* , rather than by mixture. The shade was made from a mixture of black, white and vermilion (cinnabar). A thin veil of this over a gray *imprimatura* gives a distinctly blue tone. Paint film cross-sections taken from the *Cupid Shaping His Bow* (Alte Pinakothek, Munich) showed that its blue shadows were created with two thin layers: one relies on the effect just described; the second layer amplifies the effect by being mixed with blue pigments. The yellow highlights, in this painting, are applied over the pink carnation. Indeed, this picture is superbly exemplary of Rubens' mastery in the mixing of the three colours needed to re-create skin tones.

If we now return our attention to colour and colour theories and we focus on the role of the three primaries red, yellow and blue in the theories; if we also consider Peter Paul Rubens' virtuosity in the use of those colours, and his reputation as an artist and a man of learning, it is but a small step to assume an association between the painter and the theory.

An investigation of the evidence that would support the contention that there is, in fact, an association that can be made between Rubens and colour theory is the object of this essay. As I have stated earlier, whilst pointing out the risks of unconscious advocacy, a theory can be given a validity by showing its connection with an artist of the past, or to his or her work. The reverse can also be claimed; an artistic reputation may be enhanced by a link to a theory.

Plutarch, in his *Parallel Lives* , wrote:

> It is not at all surprising that Fortune, being ever changeable, should, in the course of numberless ages, often hit on events perfectly similar. For if there be no limit to the number of events that happen, Fortune can have no difficulty in furnishing herself with parallels in this abundance of matter; whereas, if their number be limited, there must necessarily be a return of the same occurences when the whole cycle has been gone through. (Sert. 1)[78]

Plutarch, in his *Lives* , compiled forty-six biographies which he presented in pairs; each time, in the main, coupling a Roman with a Greek, and using the one to illuminate the virtues of the other, or more accurately, focusing the qualities of the Roman by finding a Greek parallel. I have chosen to use the same literary technique. I examine the evidence for a colour theory and its link to Rubens in its own right. As well, I present the parallel example of Apelles and his reputed association with a colour theory. The congruities in the biographies and reputations of Rubens and Apelles can be seen as illuminating for our interpretations. As Plutarch says, history repeats itself. Sometimes the repetition is eerie. In the case of Rubens and Apelles, we may recognize not only a parallelling of their lives but also a direct influence of the reputation of the one on the other, not only in terms of biography, but also in the context of colour theory and its history. These two artists - their biographies and reputations - have been inextricably joined. Apelles and the changes

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[78] *Plutarch's Lives*, 3 vol., Dryden Edition, rev. and intro. by Arthur Hugh Clough (London, 1929), 2, 307.

wrought to his reputation stand as an archetype for what can happen to an individual, and what has happened to Peter Paul Rubens.

CHAPTER II: PETER PAUL RUBENS

Reputation and the Man

Peter Paul Rubens is undoubtedly one of the most accomplished figures in the history of art. He deservedly won, even during his lifetime, a fame and a reputation that has scarcely been matched and certainly not surpassed. In fact, his reputation may blind us with its brilliance and make us expect to see more than is actually there.

In part, his renown rests on his remarkably versatile artistic endeavours. He left not only hundreds of masterly paintings, but also hundreds of drawings, prints and designs for tapestries, sculptures and architectural projects. His creativity spilled over into - and found further expression in - the written word. We note almost casually that he commanded, fluently, five languages. The remains of his correspondence encompass six large volumes and from this record we can acquire some measure of insight into his intelligence, his erudition, his integrity, and his tact and prudence. [79]

He was a keen and expert collector of art and antiquities. [80] His interests led him to write essays and books on his own or in collaboration. An intensive survey of Roman antiquity, carried through with his brother , Philip, resulted in the publication of a book on the customs of ancient Rome, the *Electorum Libri II*, in 1608. He wrote a second book, on architecture, the *Palazzi di Genova* , which was published in 1622. He even composed at

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[79] M. Rooses and C. Ruelens, eds., *Codex diplomaticus Rubenianus (Correspondance de Rubens et documents epistolaires concernant sa vie et ses oeuvres)*, 6 vols. ,Antwerp, 1887-1909 (hereafter referred to as *C.D.R.*).

[80] The latest study of Rubens as collector is by Jeffrey M. Muller, *Rubens: The Artist as Collector,* Princeton, New Jersey, 1989.

least one theoretical study, *De Imitatione Statuarum,* which was first published posthumously by Roger de Piles in his *Cours de peinture par principes* (Paris, 1708).

Throughout his writings, we glimpse the astonishing depth of his classical learning. We marvel, not only at his extraordinary knowledge of the antique, but also at his commanding expertise in fields as diverse as mythology, theology and the natural sciences.[81] It is with justification that Rubens' friend Nicolas-Claude Fabri de Peiresc was moved to remark that, " in matters of antiquity, he (Rubens) possesses the most universal and remarkable knowledge I have ever seen."[82] Caspar Gevaerts, another friend, was similarly inspired and wrote a comparison between Rubens and the Athenian painter, Metrodorus, in the text of the *Pompa Introitus Ferdinandi* (Antwerp, 1642): "This is magnificent praise . . . , yet the outstanding and singular virtues of Rubens justly demand an even greater one, as he has perfect knowledge of literature, and all the sciences, and is everywhere respected for his expert knowledge of public affairs."[83]

Rubens' "knowledge of public affairs" was indeed masterful; he participated in the politics and the diplomacy of his world on an international scale. He was so important in these endeavours that both Charles I of England and Philip IV of Spain saw fit to reward him with knighthoods for his services.

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[81] Rubens' library reflects these interests. He acquired the fundamental compilations of knowledge in many fields, i.e. the four volumes on zoology and the three on ornithology by Aldrovandus, to name only two areas. On Rubens' library see Max Rooses, "Petrus-Paulus Rubens en Balthasar Moretus, IV," *Rubens-Bulletijn*, 2, 1883,176ff.; Prosper Arents, " De bibliotheek van Pieter Pauwel Rubens," *Cultureel Tijdschrift van de Provincie Antwerpen*, 1, 1961,145ff.

[82] *C.D.R.*, 2, 336, Peiresc to Gian Francesco di Bagno, 26 Feb., 1622, cited in Jeffrey Muller, *Rubens as Collector* , 23; and in Christopher White, *Peter Paul Rubens: Man and Artist*, New Haven and London, 1987, 174.

[83] Caspar Gevaerts, *Pompa Introitus Ferdinandi*, Antwerp, 1642, 171, cited in Julius S. Held, "Rubens and Aguilonius," 257-264, 257, n. 3.

The many facets of Rubens' life, when assembled into a whole, cannot help but dazzle. Historiographers are often prompted to push aside Rubens' art in order to concentrate on some special and particular aspect of his diplomatic, literary or private life. And yet, oddly and ironically, the astonishing diversity of his talents and achievements is just as often treated as an art historical commonplace. Synoptic accounts of his accomplishments figure briefly in the introductions to longer studies, but his achievements, when not directly related to his art, are usually presented with little comment or explanation.

Peter Paul Rubens' story bursts the bounds of conventional artistic biography. For that reason alone, it is remarkable and worthy of study, and yet, by the same token, it becomes elusive , even chimaerical. All attempts to know Rubens the man are ultimately doomed to failure. Our image of him remains blurred and the record will stay incomplete, either by accident or design. Even from the lofty aspect of hindsight, the artist's life looks unreal, charmed somehow, as if Fortune or some other outside agency[84] had played an inordinate role. And yes, good luck was an element in his success, as Rubens was the first to recognize. In a letter of 18 December, 1634 to Peiresc which marks the resumption of their interrupted correspondence and which, as a consequence, prompts the artist to recapitulate the interim events in his life , Rubens quotes Tacitus (*Historiae*, 2.47): *Experti sumus invicem fortuna et ego.* "We know each other , Fortune and I;" but this admission does not begin to explain anything.[85]

What we have, what we are always left with, is the artist's reputation, and that inevitably presents problems. Every individual forges, through actions and deeds

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[84] See, for instance, the suggestion that the Society of Jesus had an influence on the artist's professional development and success in Erik Larson, Vernon Hyde Minor, "Peter Paul Rubens and The Society of Jesus," *Konsthistorisk Tidskrift*, 46,1977, 48-53.

[85] *The Letters of Peter Paul Rubens*, ed. and trans., Ruth Saunders Magurn, Cambridge, MA, 1955, Letter 235, 391-396, hereafter referred to as Magurn.

performed or accomplished during his or her lifetime, a unique reputation. A reputation, deserved or not, earned or not, is everyone's legacy. And reputation, guarded by friends and admirers, or assailed by enemies, inevitably changes. The dimensions change, becoming larger or smaller, exaggerated somehow or perhaps diminished. The praise accorded to Rubens, at first sight or hearing, perhaps more today than at any other time, has an aspect of extravagance. It was often expressed in the form of encomia: Rubens as "the reincarnation of Zeuxis," "the most learned painter in the world," "the Apelles of his age." These words, in their attempts to express the life and spirit of the man, resort to rhetoric; in doing so they achieve the opposite. Phrases such as these, to paraphrase Boswell, express Rubens' "panegyrick," not his life: his reputation, not the man.

With Rubens it is easy to confuse, or even to substitute, the reputation for the individual. The praise which he enjoyed was deserved and the seemingly extravagant rhetoric rings true. Rubens probably *was* the most learned painter of his age. He deserved to be called the new Apelles. But, through some curious twist, the expression of these truths has done Rubens a disservice; the accolades, though merited, seem devalued. Once devalued, they become easy to ignore or, perhaps more insidious, easy to bend, to deform, to change and to metamorphose until their subject is to all intents actually obscured. Actually, one can say that Rubens, in an odd way, has become his critics, in that they have changed his reputation and his history in order better to reflect themselves and their views.

If we confuse the reputation with the man, we are no longer aware nor do we understand that the man has been lost. We cannot hope to know Peter Paul Rubens; we must content ourselves with the shades and spectres left to us in his art, his writings and, perhaps, the records of his contemporaries. We must be careful with our expectations and their effects on our interpretations. We must be careful not to see things which are not there but which, perhaps, we would want to recognize. When reputations fail to satisfy

expectations, to fulfill promises, they are reviewed, revised and changed. "Many a man's reputation would not know his character if they met in the street." (E. Hubbard)[86]

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[86] E. Hubbard, *The Philistine* , IV, 82, as cited in B. Stevenson, ed., *The Home Book of Quotations* , New York, 1967.

Rubens' Artistic Reputation

Peter Paul Rubens' artistic reputation, during his lifetime and since, is founded on and continues to rest on his paintings. In the light of this, it is worth remembering that it has only been during this century that Rubens' works could be viewed in groups or even be seen individually with an ease that we have come to take for granted. Previously, evaluations of and changes in those evaluations of his *oeuvre* , insofar as the art was considered at all, were for the most part based on single pieces, often seen alone, in churches, in private collections and, only after about 1800, in museums. There were some concentrations of his works - in Paris for instance - in the collection of the Duc de Richelieu and of course in the *Medici Cycle*. These, as we shall see, played an important part in the academic debates of the eighteenth century.

Seventeenth-century judgements on Rubens and his artistic creations usually praise him and them for naturalism, inventiveness, creativity evident in the treatment of the narratives, and for the virtuosity and speed of execution.[87] Examples of such evaluations are numerous and, though often uneven in their degree of worthiness for serious scholarly consideration, they are usually positive in their assessments.

The comments of Scoppius, Daniel Heinsius, Domenicus Baudius, Caspar Gevaerts, Constantijn Huygens and Balthasar Gerbier provide some early and representative evaluations. Writers farther afield also offered favourable criticism: Henry Peacham in England; Giovanni Baglione and Giovanni Pietro Bellori in Italy; Joachim van

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[87] A remarkable feature of early critiques is their praise for Rubens' evocation of what was to become known as the sublime. Constantijn Huygens, for one, singled out Rubens' *Head of Medusa* for particular praise. See Jan Gerrit van Gelder, "Das Rubens-Bild. Ein Rückblick," *Peter Paul Rubens: Werk und Nachruhm*, Munich, 1981, 11-45, also as, "de Waardering van Rubens, een terugblik," *Antwerpen. Tijdschrift der Stad Antwerpen* , 31, 1977, 178-197. This continues to be the best historiographic review of Rubens' critical fortunes. See also O. Bock von Wülfingen, *Rubens in der deutschen Kunstbetrachtung* , Berlin, 1947.

Sandrart in Germany; Roger de Piles, André Félibien and Charles du Fresnoy in France, to mention only a few of the art historically illustrious names.[88] The type of praise, penned by artists, critics and writers such as these, forms a long tradition that still flourishes.

However, if one reads some of the early biographies, it soon becomes apparent that they betray a certain uniformity in their outlines. Van Gelder has remarked on this and points out that it is usual to find the same biographical facts presented in the same way. These details are then most likely to be followed by an unsystematic and uncritical list of Rubens' works. Throughout, the characterization of the artist is limited and almost formulaic; something along the lines of Baglione's description as *"Pittore universale & abbondante di varie inventioni* ;" the works are often described in a similar manner, *"con gran vivacità , e con naturalezza."* [89]

Joachim von Sandrart, a fellow artist, wrote a lengthy but not overly accurate biographical sketch of Rubens in his *Academie der Bau-, Bild-, und Mahlery-Künste* (Nuremberg, 1675). Von Sandrart was a younger contemporary of Rubens, and had had in his youth, while a student in Gerrit van Honthorst's studio, the opportunity to accompany Rubens for almost two weeks on the latter's travels through the Netherlands.

Von Sandrart's biography of the artist adheres, in the main, to established conventions. He praises Rubens in the usual manner, but there is an added, uncomfortable element in his account. Von Sandrart emphasizes, a number of times, Rubens' wealth. He

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[88] I do not propose to discuss all of these, only those whose comments are found to be relevant to our argument. The standard work on the literary appreciation of Rubens is Prosper Arents, *Geschriften van en over Rubens* , Antwerp, 1940. See also, in addition to the references in my note 8, L. Rens, "Rubens en de Literatur van zijn tijd," *Dietsche Warande en Belfort*, 1977; M. van der Meulen, "Rubens in Holland in de zeventiende eeuw: enige aanvullingen," *Rubens and his World*, Antwerp,1985, 307-317. The latest overview is by Peter Sutton in Exhibition, Boston, Museum of Fine Arts, *The Age of Rubens*, Boston, 1993; catalogue by Peter Sutton *et al* , 87-96.

[89] As cited in Jan Gerrit van Gelder, "Das Rubens-Bild," 19.

remarks on the good marriage that the artist had made; he comments on Rubens' business and trading acumen; he also lists the honours which he received. In short, the tenor of the text is somehow unpleasant. It is true that he praises Rubens' virtuosity and the speed with which he worked (*meisterhaft und geschwind*). He also singles out his *Inventiones* (*ungemein anmuthig, werksam und fröhlich*). More than once he reiterates that Rubens' colouring was pleasant (*nach Annehmlichkeit der Augen sehr freudig colorirt*).[90] However, he then warns that painting in the manner of Rubens is not as good as working after the antique (*des Rubens Manier zu folgen ist nicht so gut als nach den Antiken zu arbeiten*). Further, he also maintains that Rubens' drawing is not always "*correkt.*"[91]

This notion of faulty, even incorrect, drawing was repeated by du Fresnoy. It is true that in the main, du Fresnoy's comments are, perhaps somewhat predictably, favourable, even genuinely complementary. However, he also wrote that Rubens' "Design savours somewhat more of the Fleming, than the beauty of the Antique; because he stayed not long at Rome ... it must be confess'd that generally speaking , he designed not correctly."[92]

In the French academy of the 1660's, design (drawing) and its relationship to colour, and even more importantly its relationship to chiaroscuro, became fiercely contested issues of debate.[93] These controversies produced an important and influential body of literature.

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[90] Joachim von Sandrart, *Academie der Bau-, Bild-, und Mahlerey- Künste*, ed. A.R. Peltzer, Nuremberg, 1675, repr. Munich, 1925, 157, 159.

[91] Jan Gerrit van Gelder, "Das Rubens-Bild," 19.

[92] Trans. from *The Art of Painting by C. A. du Fresnoy with Remarks: Translated ... by Mr. Dryden* , 2nd ed., London, 1716, 236, cited in Peter Sutton, *The Age of Rubens* , 103, n. 292.

[93] On chiaroscuro in this context see, M. Rzepinska, "Tenebrism in Baroque Painting and Its Ideological Background," *Artibus et historiae* , 13, 1986, 91-112. On the debate see, B. Teyssèdre, *Roger de Piles et les débats sur le coloris au siècle de Louis XIV* (Paris, 1965). An English summary can be found in A. Soreil, "Poussin versus Rubens: The Conflict between Design and Colour in France," *Palette*, 12, 1963, 3-12. See also J.

The polemics of the debate purported to oppose emotion with reason, colour with line and contour. Rubens became the ideal of the first (the *Rubenistes*), Nicolas Poussin the exemplar of the second (the *Poussinistes*). Each painter found a champion: Rubens in Roger de Piles,[94] Poussin in Félibien. To give just a brief indication of the heat of the argument, we note that Félibien referred to Rubens as an *"artiste detestable"* in the Fourth Part of his *Entretiens sur les vies et sur les ouvrages des plus excellens peintres* (Paris, 1666-1685).[95]

As mentioned above, although Rubens' paintings were not generally seen, there was a concentration of them in Louis XIV's Paris. The king himself had a version of the *Queen Tomyris* hung behind his throne at Versailles. In addition, the Palais de Luxembourg housed the *Medici Cycle* and a further twenty-eight works were held in the collection of the Duc de Richelieu. Roger de Piles had helped the Duc to assemble these into what was to be the largest private collection of Rubens' works in the seventeenth century.

De Piles catalogued the collection in his *Cabinet de Mgr. le Duc de Richelieu* (Paris, 1676-1681).[96] As van Gelder has pointed out, this catalogue, along with de Piles' *Dissertation* was the first, long unsurpassed, example of a critical and analytical text on the

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Thuillier, "Doctrines et querelles en France au XVIIe siècle," *Archives de l'art français*, 23, 1968, 125-217, and Max Imdahl, *Farbe: Kunsttheoretische Reflexionen in Frankreich*, Munich, 1988.

[94] See *Dialogue sur le Coloris* , Paris, 1673; *Conversations sur la connoissance de la peinture* ,Paris, 1677; and *Dissertation sur les ouvrages de plus fameux peintres*, Paris, 1681, the latter included "La vie de Rubens."

[95] As quoted in Peter Sutton, *The Age of Rubens*, 87.

[96] See B. Teyssèdre, "Une collection française de Rubens au XVIIe siècle: le cabinet du Duc de Richelieu, décrit par Roger de Piles (1676-1681)," *Gazette des Beaux-Arts*, 62, 1963, 241-300.

works of Rubens, augmented by careful research and new information about the painter's life.[97]

It was to be de Piles and his ideas and expressions on painting that would win the day, or at least hold sway, in the academic debates of the time. De Piles continued to work on and to refine his ideas in *L'idée du peintre parfait* (Paris, 1699). In this text he maintains his defence of Rubens against earlier criticisms, such as those voiced by Félibien. Using the *Medici Cycle* as proof, de Piles exalted Rubens' ability to separate *"la fable et la vérité."* Félibien had written in his *Entretiens* that, *Rubens possedoit beaucoup de belles parties, qui le faisoient estimer de tout le monde; & sa reputation étoit si grande, qu'on auroit, crû passer pour ridicule, ou pour ignorant, de censurer ses plus grandes défauts. Aussi est-il vrai que dans le temps qu'il travaillot, on n'étoit pas si difficile sur la bienseance qu'on l'est aujourd'hui.*[98]

De Piles defends Rubens; the form of the defence - the praise for his ability to differentiate *la fable et la vérité* - is such that it sets itself above earlier criticisms, like those voiced by Bellori,[99] Sandrart and du Fresnoy. In a very clever manner, de Piles subsumes these in order to use them to his own ends.

In 1708, de Piles published his *Cours de Peintures par principes*. In the appendix, "La Balance des Peintres," he laid out a chart in which he quantifies the achievements of the great masters. He awards points on a scale of one to twenty in four groups or categories - *les parties essentielles* - relevant to painting: *scavoir' la Composition, le Dessein, Le*

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[97] Jan Gerrit van Gelder, "Das Rubens-Bild," 22.

[98] As cited in Jan Gerrit van Gelder, "Das Rubens-Bild," 22.

[99] Bellori also found fault with Rubens' drawing, he missed the *grazia de'contorni, che egli alterava con la sua maniera.* He also speaks of the *furia del pennello.* G. P. Bellori, *Le vite de'Pittori, Scultori ed Architetti moderni,* Rome, 1672, 267, cited in Max Imdahl, *Farbe* , 63.

Coloris, et L'Expression. Each category could be made up of two or more elements; drawing is composed, for instance, of *la Correction* and *le Gout.*

Although a painter could theoretically earn a possible twenty points in each of the categories, de Piles did not allot more than eighteen to anyone. He awards Rubens a seventeen for his use of colour (as he did to Rembrandt, van Dyck and others; only Titian and Giorgione were assigned eighteen). He also gives a very low score to Rubens in drawing: thirteen, and yet, in the overall score, Rubens shares the highest points with Raphael. Rubens is rated equal to the most revered painter of the Italian Renaissance, in spite of his weak drawing. In short, and by implication, drawing does not matter or rather is not as important , at least to de Piles, as colour.[100]

De Piles concedes that Rubens' drawing was weak and , in explanation, relies on reasons already oft repeated. He avers that the *fautes.... ne viennent que de la rapidité de ses productions.*[101] He also resorts to blaming Rubens' Flemish heritage and early Flemish teachers. In spite of his study of the antique, *le naturel de son pais, dont il se servoit, ... fait tomber malgré luy dans un caractère Flamand, et luy ont quelquefois fait faire un mauvais chois, qui donne atteinte à la régularité de son dessein.*[102]

Quickly, the accusations became unquestioned "fact." In spirit, the biographies that followed were admiring and full of praise. William Hogarth, for example, noted that Rubens' "manner is admirably calculated for great works, to be seen at a considerable distance, such as his celebrated ceiling at Whitehall-chapel."[103] Jonathan Richardson, in

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[100] See Peter Sutton, *The Age of Rubens,* 88.

[101] As cited in Jan Gerrit van Gelder, "Das Rubens-Bild," 22; Max Imdahl, *Farbe,* 63.

[102] As cited in Jan Gerrit van Gelder, "Das Rubens-Bild," 22.

[103] William Hogarth, *The Analysis of Beauty*, London, 1753, 122, as cited in Peter Sutton, *The Age of Rubens* , 88. This observation is interesting because it brings to mind Rubens words in a letter to William Trumbull about the Banqueting Hall (26 January,

his *Treatise on Painting* (London, 1715) announces Rubens as the greatest painter of the seventeenth century.[104] George Turnbull, in his *A Treatise on Ancient Painting* (London, 1740), was of a different opinion. He had this to say about Rubens: "His great freedom is extraordinary: But hence proceeded his Incorrectness, not in Design merely, but likewise in Colouring as Félibien and others have observed; the Tints of his Carnations beeing [sic] often so separated the one from the other, that they seem like Spots." In summation, "Reubens [sic] failed in what regards Taste of Beauty, and very often in Design .... All the Errors he committed, he was transported into them by the Rapidity and Impetuousness of his Genius." Furthermore, failure in "Taste of Beauty" was a direct result of the fact that Rubens "still continued to paint Flemish Features and Proportions, and could rise to no higher Ideas of Beauty."[105]

These facile assessments were to hold sway, in England at least, until 1781. In that year, Joshua Reynolds, the president of the Royal Academy, visited Belgium and Holland. During the two and one half months of his tour, Reynolds, who had been sceptical of Rubens as an artist, completely revised his opinion. Once having seen a wider selection of the Fleming's art, he identified Rubens as a representative example of a style of working that was recognizable as one that produced a self-contained, imaginative, coherent *oeuvre* . This was Reynold's "Characteristical Style" as opposed to his "Grand" and "Ornamental" styles. The practitioners of this third style were often gifted with Genius, a then-recent philosophical formulation which celebrated the ability of those few individuals to break norms and conventions creatively and with impunity. Reynolds held that, "The work of

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1621), Magurn, Letter 46, 77: "I confess that I am, by natural instinct, better fitted to execute very large works than small curiosities." As well, Hogarth's remark about viewing distance recalls Roger de Piles added rationale about Rubens' drawing: that every Rubens painting had an established viewing distance and that it was a waste of time to work over detail that would not need to be seen. See Max Imdahl, *Farbe*, 63-65.

[104] Peter Sutton, *The Age of Rubens*, 89.

[105] As cited in Jan Gerrit van Gelder, "Das Rubens-Bild," 23.

men of genius alone, where great faults are united with great beauties, afford proper matter for criticism. Genius is always bold and daring."[106] In his *Journey to Flanders and Holland* (London, 1781), Reynolds wrote of Rubens that his, "Superiority is not in easel pictures," but rather, "in the general effect ... in the genius which pervades and illuminates the whole."[107]

We see that Reynolds has excused the incorrect drawing; perhaps he even saw it as the necessary flaw in Rubens' genius and, as such, evidence or even proof of the same.

This, however, begs the question. Was Rubens' drawing ever "weak" or "incorrect"? The accusation had been levelled (it matters not whether first by Bellori or Sandrart) and once voiced and once repeated it quickly became part of the mythology, the reputation, of Rubens. This verdict has never been completely dislodged, let alone expunged, from Rubens' reputation. The issue is still addressed, even if only to acknowledge it as an earlier, erroneous judgement. In fact, it was at one time used as a useful ploy, by de Piles, as we have seen, to further theoretical aims that in essence had nothing to do with Rubens *per se.* The reputation took on its new metamorphosed life, unquestioned in this particular, and once again the artist, Rubens, began to lose definition, or rather, it might be said, he began to assume a revised identity that was not acknowledged as such. Again, *Rubens became his critics.*

The Artists and the Noble

Peter Paul Rubens has often been referred to as a "noble" painter. This is true, of course, since he was knighted by two of his patrons, but upon reflection, the idea of

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106 Sir Joshua Reynolds, *Discourses*, ed. Robert R. Wark , San Marino, CA, 1959, 86, also as cited in Peter Sutton, *The Age of Rubens*, 89.

107 Sir Joshua Reynolds, *Discourses*, ed. Robert R. Wark , San Marino, CA, 1959, 86, also as cited in Peter Sutton, *The Age of Rubens*, 89.

Rubens' "nobility" gives pause; the context of the accolade becomes telling. Was Rubens a practitioner of a noble profession; a noble example of such a practitioner; a painter of noble - excellent and elevated - works; a man of noble character; or an aristocrat who also painted?

This apparent splitting of adjectival hairs has a point. All of these aspects are true of Rubens' character and personality: nobility of talent, nobility of character and nobility of rank. However, the descriptions are often blurred to the point of synonymy; and the blurring invites simplification and thoughtless acceptance. The reputation is again changed, although enriched, and the artist again loses definition.

Rubens exercised his art at a time when his profession, finally, after a long struggle, had begun to benefit from profound changes in its social status. Painting had become a Liberal Art instead of the Mechanical Art it once was; Painting was worthy of the same dignity as scholarly learning and poetry.[108]

This long fight is a much discussed episode in the history of Renaissance, particularly Italian Renaissance, art. By the late sixteenth century, this change in social standing for artists, although still not a given, had been recognized and accepted, more or less, throughout Europe. In 1595, Rudolph II allowed the painters of Prague to refer to their profession as the art of painting (under the aegis of Minerva) rather than as a simple vocation. In 1610, Nicholas Hilliard, in England, averred that simple workmen should not be responsible for the Liberal Art of Painting, rather, it was worthy of practice by the learned, by courtiers, by aristocrats and even by princes.[109]

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[108] See Rensselaer W. Lee, *Ut Pictura Poesis: The Humanistic Theory of Painting*, New York, 1967.

[109] Hans Kauffmann, "Peter Paul Rubens im Licht seiner Selbstbekenntnisse," *Wallraff-Richartz- Jahrbuch* , 17, 1955, 181-188.

In this context, we can perhaps discern an added meaning or weight in Sir Dudley Carleton's reference to Rubens as "the painter of princes and the prince of painters."[110] Rubens' response, in a letter to Carleton dated, 12 May, 1618, was a denial: "I am not a prince, *sed qui manducet laborem manuum suarum.*" (Psalm 128:2: But one who lives by the work of his hands).[111]

That the issue of the status of the artist had not been fully resolved in all quarters is evident in the remarks of Henry Peacham. Peacham, who also praised Rubens, wrote in *The Compleat Gentleman* , "whosoever labour for their livlihood and gaine, have no share at all in Nobility or Gentry: as Painters, Stage-players, Tumblers, ordinary Fiddlers, Innekeepers, Fencers, Iugglers, Dancers, Mountebanckes, Bearewards, and the like: (except the custome of the place determine the contrary)."[112]

Rubens was "put in his place" at least twice. Philip IV questioned the abilities of a "common painter" in representing his country as a diplomat. The duke of Aerschot upbraided Rubens in a public letter for not having accorded him the respect due an aristocrat from a painter.[113]

Late in his life, when Rubens had remarried, he wrote of the reasons for his choice of bride to his friend Peiresc in a letter which I have already had occasion to mention: "I have taken a young wife of honest but middle-class family, although everyone tried to persuade me to make a Court marriage. But I feared *commune illud nobilitatis malum*

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[110] H.G. Evers makes reference to this and to another letter by Carleton that reiterates the sentiment. H.G. Evers, *Rubens*, 253.

[111] Magurn, Letter 29, 61-63. There is an added dimension to the denial, it implies that Rubens is not rich. He was engaged in negotiations for the sale of art works to Carleton at the time of the letter.

[112] Henry Peacham, *The Compleat Gentleman*, London, 1634, 12-13, cited in Jeffrey M. Muller, *Rubens as Collector*, 50.

[113] Jeffrey M. Muller, *Rubens as Collector*, 50.

superbiam praesertim in illo sexu, and that is why I chose one who would not blush to see me take my brushes in hand.[114]

Thus we begin to discern that all was not really as the mythology of the reputation would have us believe. Jeffrey Muller has examined carefully the circumstances of Rubens' ennoblement and offers an interpretation with which I agree. He has looked to Rubens' background and found in it the determinants for the artist's goals and opportunities.[115]

The artist's parents, Maria Pypelinckx and Jan Rubens, were both from prosperous trading families. For a man of Jan Rubens' social position - solidly bourgeois, not quite patrician - two choices of career were seen as possible for social advancement: trading and merchant banking or the legal profession and public administration. Jan Rubens chose the latter. As a young student he went to Padua. He resided and travelled in Italy and the south of France for seven years. He earned the title of Doctor of Laws in Rome in 1554. He returned to Antwerp in 1557 and opened a practice as a lawyer. He married the artist's mother in 1561. One year later he became an alderman or senator (*schepen*) of the city of Antwerp and was well on the way to being established in a career that in the normal course of events would have guaranteed a great measure of success; becoming mayor of Antwerp was not beyond his prospects. Unfortunately, political events put paid to these plans. In 1566 the Prince of Orange had designated Jan Rubens as a negotiator between the magistracy of the city and the Protestants. The fact that he was a Calvinist and a *schepen* put him into a difficult position and he thought it wiser to follow the prince to Germany when the Protestant position collapsed. The family settled in Cologne which was a Catholic city, but Jan Rubens' political and influential business contacts offered a measure

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[114] Magurn, Letter 235, 391-396.

[115] Jeffrey M. Muller, *Rubens as Collector*, 48-63. Further bibliography is to be found in his notes.

of protection to the family. He was successful, and in a very short time became the legal advisor to Anna of Saxony, the wife of William of Orange.

The two embarked upon an adulterous affair that did not remain secret; Anna gave birth to a daughter, Christine von Dietz, in August, 1571. The affair was to have lasting consequences; Jan Rubens was imprisoned and, in the end, was held for two years, before he was able to return to his family in 1573.[116] For the rest of his life, he now had to struggle to support them. A decade later he wrote that " for the welfare of our children, to educate and advance them, we have spent more than we are capable of, since we had hope that our parents would leave us something to live on. But now the common calamity has deprived them.... we are so very poor that it is necessary for me to work night and day to earn the daily bread for my seven children, wife, and myself."[117] (Maria Pypelinckx, for her part, conducted a small business to augment the family income.) Jan Rubens died in 1587 and the family was able to return to Antwerp two years later. Peter Paul was eleven years old at the time.

The family found itself in a social position that can only be described as ambiguous. They were genteel (without a hint of sarcasm) but financially straitened. Maria Pypelinckx had property as assets but the income had declined steadily. The help of friends and associates allowed them to maintain a higher social profile than might have normally been expected. For example, Pierre Pecquius, a prominent lawyer and a later chancellor of Brabant, served as family counsel. Peter Paul was able to attend a good school run by

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[116] For background information on the Rubens family, see the writings of P. Genard, particularly, *P.P. Rubens: aanteekeningen over den grooten meester en zijne bloedverwanten*, Antwerp, 1877. On the affair, see Hans Kruse, "Wilhelm von Oranien und Anna von Sachsen. Eine fürstliche Ehetragödie des 16. Jahrhunderts," *Nassauische Annalen, Jahrbuch des Vereins für Nassauische Altertumskunde und Geschichtsforschung*, 54, 1934, 59ff. Also H. Evers, *Peter Paul Rubens*, Munich, 1942, 11-22.

[117] P. Genard, *Aanteekeningen*, 221-27, letter to Count Johann of Nassau, 24 September, 1582, cited in J. Muller, *Rubens as Collector*, 49.

Rumoldus Verdonck. One of his classmates and someone who was to become a lifelong friend was Balthasar Moretus, the scion of the celebrated printing and publishing family.

Rubens' stay at the school ended when he was thirteen, and with it ended his formal education. He joined the household of Lady Margaret of Ligne, the widow of Philip, Count of Lalain, as a page.[118]

As Jeffrey Muller has pointed out, this background was significant for Rubens' later life. He had high social standing; he was educated in a manner that allowed him to converse with the upper classes, in fact, he went to school with them. He was trained in the social graces in an aristocratic court, but he had no money.[119] Perhaps the financial resources of the family became even more strained. His nephew Philip wrote, that Rubens, "suddenly bored with life at court and drawn by his genius toward the study of painting, . . . begged his mother, now that the financial resources of his parents were exhausted by the wars, to place him under the instruction of Adam van Noort, a painter of Antwerp."[120]

Rubens had to earn his own living, his own position and wealth; in this he was different from those at court. Nevertheless, striving to better himself by his own "virtue" was nothing less than expected by the ideals of his age and place. "Those who, coming from an honourable family, find themselves in a very lowly or mediocre position should strive to rise by means of skill and to conquer nature by means of industry," wrote Philippe

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[118] See L.R. Lind, "The Latin LIfe of Peter Paul Rubens by his Nephew Philip: a Translation," *Art Quarterly*, 9, 1946, 37ff.

[119] Jeffrey Muller, *Rubens as Collector*, 49.

[120] L.R. Lind, "The Latin Life of Peter Paul Rubens," 37.

Ariès. And, once achieved, "his nobility will be more honourable if he acquires it by merit than if he had it by birth."[121]

Rubens chose to become a painter and by so doing it would seem that he made it even more difficult for himself to gain stature in the eyes of his contemporaries. Muller has also pointed out that Rubens, though striving for recognition and for membership in the nobility, achieved this, finally, by seemingly always to assert his independance from it.[122] For example, he disobeyed the Duke of Mantua on a number of occasions while in his employ, and finally left his service altogether, and the country, without his permission. Upon his return to Antwerp in 1608, he was made a generous offer by the Archduke and the Infanta which he turned down, to his ultimate gain. He managed to be given permission to live in Antwerp, rather than Brussels; he was awarded an annual stipend; he was considered for court commissions; and, he had the advantages of the court -its favour - without having to be there. On a more subtle plane, as Muller notes, and as have others earlier, his connections with the court allowed him to practice his art without having to be a member of the painter's guild; he was thus effectively free of the stigma of manual labour.[123]

The archdukes made it a policy to admit large numbers of merchants and magistrates into the nobility; Rubens also petitioned for this honour in 1624. After investigation into Rubens' background the request was approved by Philip IV on 5 June, 1624. It was granted, in part, because Rubens was descended from honourable parents. His father was recognized as having fulfilled important duties. He had also been an

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[121] Quotations in Philippe Ariès, *Centuries of Childhood*, trans. R. Baldick , New York, 1962, 387, from François de Grenaille, *L'Honneste garçon* (1642), also cited in Jeffrey Muller, *Rubens as Collector*, 50.

[122] Jeffrey Muller, *Rubens as Collector*, 51.

[123] Jeffrey Muller, *Rubens as Collector*, 51.

accomplished man: a magistrate of the city of Antwerp and a Doctor of Law. Rubens' brother Philip's position as a secretary to the city also added weight to Peter Paul's respectability.

The elevation in status helped Rubens in his diplomatic work; this intensified during these years. Rubens success as a diplomat was honoured with a knighthood by Charles I on 3 March, 1630, in London. The knighthood followed on the heels of the degree of *Magister in Artibus* which the governors of Cambridge University had bestowed in 1629. In addition to the title, Charles I allowed Rubens use of a field from his coat-of-arms, made him a gift of a jewelled dagger, a ring, a diamond studded hatband and a gold chain. As well, he paid all the expenses of Rubens' long sojourn in England.

The Infanta and the King of Spain knighted Rubens in their own right on 16 July, 1631. Upon receipt of the petition from the artist for the title, the supreme council of Flanders informed Philip IV that he could grant the request because there was a precedent: Charles V had made Titian a Knight of St. James. There is something seemingly significant in the congruency of the rationale and the esteem in which Rubens held the Venetian.

Rubens strived for the recognition of, and for a more elevated position in, his society. He was never forgetful of his roots nor did he ever deny his primary identity as an artist. His nobility, actual and adjectival, was undeniably an integral part of his personality. However, it is a complicated issue and our understanding of it is not as simple as the legend would have it. The reputation has been robbed of detail and even its substance is threatened.

CHAPTER III: APELLES

Reputation and the Man

A particularly apt example of a reputation being amended to suit the changes in circumstances dictated by time, can be seen in the legend of Apelles. The story of Apelles provides an illuminating analogy to our discussion of Rubens; the parallels in their reputed biographies are revealing, and even poignant, in this context, because, as we have noted, the later artist was often compared to Apelles.

Although the comparisons were often voiced as rhetorical encomia, there is substance to them. Both artists enjoyed unsurpassed reputations as painters and, more interesting for this discussion, as art theorists. In both cases, the reputations have outstripped the proof. Nevertheless, the legends were to be influential to the point where it becomes exceedingly difficult to separate fact from fancy or wishful expectation.

Most of what we know about Apelles is gleaned from the writings of Pliny and Lucian; the tradition surrounding Apelles thus comes from literature.[124] We have no works by Apelles, either written or painted. Apelles' posthumous reputation , however, took a far from simply literary guise. He was reputed to be extraordinarily successful both financially and socially; he was also considered to be particularly adept at defending himself from professional criticism. These factors, and others, made him a natural hero for painters, particularly those of the Renaissance: the re-discovery of Apelles was a Renaissance achievement. From the sixteenth century onwards, episodes from his life were celebrated in paintings with increasing exuberance. One episode, the *Calumny*

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[124] For the literary sources see A.-J. Reinach, *Textes grecs et latin relatifs a l'histoire de la peinture ancienne*, Paris, 1921.

enjoyed particular popularity, both in visual art and in literature.[125] This satire, the only known painted satire in antiquity, was re-interpreted repeatedly in painted images.

Apelles' influence, or rather that of his reputation, was much more profound. He came to be seen as the one paradigmatic master from the ancient, perfect past. Classical art was important in the sixteenth and seventeenth centuries because it provided tangible examples of almost lost paradigms; as Franciscus Junius, a contemporary and correspondant of Rubens, wrote, "the which being well observed by the old Artificers, made them come nearer to the height of perfection."[126] Apelles was the greatest of the old "Artificers"; Guillaume Bude saw him as, *Le noble et excellent Peinctre sur touts ceux qui iamais fufrent*.[127] This belief in the excellence of Apelles was an article of faith that was to remain unquestioned until the nineteenth century. It was Baudelaire who averred that the praise showered on Apelles was nothing more than a tradition, and as such it was valueless and meaningless.[128]

It did not matter that none of Apelles' works had survived the ravages of time to be tested for their qualities and virtues. The superiority of all classical painting was a given; it was proven and guaranteed, as Castiglione pointed out, by the excellence manifest in the surviving monuments carried out in the seemingly more durable medium of sculpture; or as

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[125] See David Cast, *The Calumny of Apelles; A Study in the Humanist Tradition*, New Haven and London, 1981.

[126] Franciscus Junius, *De pictura veterum*, Amsterdam, 1637, cited in David Cast, *Apelles*, 162.

[127] Guillaume Bude, *De l'institution de prince*, Paris, 1547, cited in David Cast, *Apelles*, 162.

[128] Baudelaire, (La Presse, 2 April 1844), in *Baudelaire, Salon de 1846*, ed. D. Kelley, Oxford, 1975, 95, cited in D. Cast, *Apelles*, 162.

Diderot was to summarize, Agesias (sculpture) could stand witness for Apelles (painting).[129] Reputation was all that mattered. Substance was not questioned.

Most of what the scholars of the early Renaissance knew of Apelles comes from the *Natural history* of Pliny.[130] This provided the foundation for the writings of Ghiberti, Alberti, Vasari (and of all those who followed).

Vasari's work can be regarded as fundamental to the history of art. His biographies of painters from Cimabue and Giotto to his (Vasari's) contemporary, Michelangelo, changed in a profound way the manner in which art and its *progress* was to be regarded. It was Vasari who created a comprehensive historical context; a context that organized the past in a cyclical fashion, that is reminiscent of the notion of the Ages of Man.[131]

Vasari's biography of Apelles is incomplete; it was only in the seventeenth century, that scholars, as a result of their burgeoning interest in philology, were able to present a comprehensive and more accurate picture.

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[129] *Oeuvres complètes de Diderot* , ed. J. Assezat and M. Tourneaux , Paris, 1875-77, 10, 439, cited in D. Cast, *Apelles*, 162.

[130] Pliny, *Natural History*, 35, 79-97. See also A.J. Reinach, *Receuil Milliet* , Paris, 1921, 314-57, and W. Lepik-Kopaczynska, *Apelles: der berühmteste Maler der Antike* , Berlin, 1962. I have relied on the translation of K. Jex-Blake, *The Elder Pliny's Chapters on the History of Art*, London, 1896.

[131] Giorgio Vasari, *Le Opere* , ed. Gaetano Milanesi, 9 vols. , Florence, 1906, 1, 243. See Zygmunt Wazbinski, "L'idée de l'histoire dans la premiere et la seconde edition des *Vies* de Vasari," *Il Vasari storiografico e artista*, Florence, 1974, 2-3. On the notion of artistic progress, see E. H. Gombrich, "The Renaissance Conception of Artistic Progress," *Norm and Form: Studies in the Art of the Renaissance*, London, 1966.

An extended *life* was published by Franciscus Junius in his *De Pictura Veterum* (Amsterdam, 1637).[132] It was a dense, difficult, almost forbidding text. Even Rubens, in a letter to the author, remarks that it is a little too abstract.[133]

Later artists were probably more likely to have turned to other, more accessible sources, such as von Sandrart's *Teutsche Academie* (Nuremberg, 1675). Sandrart, in this instance, was careful in his research. A comparative reading of his work makes clear that he had consulted the writings of Junius as well as those of Carl van Mander and Carlo Dati.[134] It is a comprehensive account and is probably a good indication of the general knowledge of Apelles' life available to artists at the time of writing.

Sandrart's version is typical, perhaps even formulaic, insofar as it praises Antiquity, next criticizes the Middle Ages, and then commends the Renaissance. His writing, however, is rich in detail. He begins with a partly mythical outline of the pre-history of painting, then proceeds, with more authority, to artists of the later classical period: Polygnotus, Telephanes, Phidias, Apollodorus, and Callimachus; he lists over forty names. All of these can be seen as a prelude to the veritable prince of painters, Apelles ("der Prinz aller Kunstmahlers...").[135]

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[132] For a discussion, see Allan Ellenius, *De Arte Pingendi: Latin Art Literature in Seventeenth-Century Sweden and Its International Background*, Uppsala and Stockholm, 1960, 33-54.

[133] Magurn, Letter 241, 406-8.

[134] See Karl van Mander, *Het Leven der onde Antijcke Doorluchtighe Schilders*, ed. H. Miedema , Amsterdam, 1977, and A. Minto, *Le vite dei pittori antichi di Carlo Roberto Dati e gli studi erudito-antiquari del seicento*, Florence, 1953. For a relevant discussion of Sandrart, see W. Waetzoldt, *Deutsche Kunsthistoriker von Sandrart bis Rumohr* , Berlin, 1962, 24-42.

[135] As cited in David Cast, *Apelles*, 163.

Sandrart begins this biography by noting that Apelles had help with his career; he had always received much aid and encouragement from his patrons, most notably, Alexander the Great.

In this way, he was not unlike Virgil with Augustus, or Ariosto with Charles IV, or Raphael and Michelangelo with the Popes. Here we can perhaps interject appropriately with the note that Rubens' mythology is also, at times, intimately bound with the august status of some of his patrons.[136]

Pliny recounts that Apelles was a pupil of Pamphilus, the Sicyonian artist and that he was active all over the Greek world, most notably at the court of Alexander. Sandrart continues the biography with remarks about Apelles' skill with colour. This aspect, which cannot be overemphasized, was to become ever more important to later chroniclers and art theorists.

Two traditions flourished: Apelles had used a dark or tinted varnish on his paintings, this harmonized his colours; and, he had quite deliberately limited his palette to four colours: red, yellow, black and white.[137] This did not imply that Apelles' works were limited to these four hues, but rather that the four were mixed to make *all* the other colours that might be needed.

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[136] For an examination of Rubens' patronage, particularly right after his return from Italy in 1608, see Frans Baudouin, "Rubens' Social and Cultural Background," *Stil und Überlieferung in der Kunst des Abendlandes*. Akten des 21. Internationalen Kongresses für Kunstgeschichte in Bonn, 1964, 3 vols., Berlin, 1967, 3, 9ff.

[137] For Apelles as a four colour painter see Pliny, *Natural History*, 35, 50. See especially John Gage, "A *Locus Classicus* of Colour Theory: The Fortunes of Apelles," *Journal of the Warburg and Courtauld Institutes*, 44, 1981, 1-26. See also David Cast, *Apelles*, 164, n.6, for further references. For information on Apelles' dark varnish, see Ernst Gombrich, "Dark Varnishes: Variations on a Theme from Pliny," *Burlington Magazine*, 104,1962, 51-55, as well as articles by Joyce Plesters and D. Mahon in the same volume: "Dark Varnishes - Some Further Comments" and "Miscellanea for the Cleaning Controversy." See further Ernst Gombrich, "Controversial Methods and Methods of Controversy," *Burlington Magazine*, 105, 1963, 90ff., and O. Kurz, "Time the Painter," *Burlington Magazine*, 105, 1963, 94.

Sandrart then goes on to note the virtuosity, the grace (*venustas*) of Apelles' style of painting. It was known that the ancient artist, like Rubens, in the eyes of his admirers, did not overwork his panels; he knew just when to stop, when to take his *manum de tabula.*

Next, he gives an account of Apelles' contest with Protogenes, in which each drew a finer and finer line until Apelles finished with the *linea summae tenuitatis.*[138]

This is followed by praise for Apelles' industry and the fact that he drew each and every day (*nullus dies sine linea*). After this are two familiar stories about Apelles putting his critics in their proper place. First he talks about the cobbler, who having been consulted by Apelles on the proper appearance of a shoe in one of the artist's works, presumes to widen the scope of his criticism. Apelles tells him to stick to what he knows; not to go beyond his last (*ne sutor ultra crepidam)* (Pliny, *Natural History*, 35, 85). The second story is the more remarkable: Apelles tells Alexander to keep quiet. Alexander had made a silly comment about one of Apelles' paintings. Apelles instructs him to hold his tongue because the apprentices were laughing at him (Pliny, *Natural History*, 35, 85).

Sandrart then recounts the story of Apelles and Campaspe and the Alexandrian edict that only Apelles would be allowed to paint the ruler (Pliny, *Natural History,7, 125).* Sandrart completes his biography with a general list of Apelles' works.

Over time, particularly since the Renaissance, Apelles came to be seen not only as a great painter but also as an *exemplum virtutis*, he was considered to have been without blemish in all the facets of his life. Pliny noted his friendliness; Gianbattista Adriani remarked on his simplicity and sincerity; Lomazzo saw him as having been kind and free of

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[138] The story of this contest was given many interpretations in the Renaissance and later. See H. van der Waal, "The "Linea Summae Tenuitatis" of Apelles: Pliny's Phrase and Its Interpreters," *Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft*, 12, 1967. See also Ernst Gombrich, *The Heritage of Apelles*, London, 1976.

a single foul impulse or opinion.[139] Roger de Piles was moved to write, "Envy, which is so often met with among persons of the same profession, never entered the soul of Apelles, and if he endeavoured to raise himself, it was wholly by the assistance of his art."[140]

Such a paradigm invites comparison; it was nothing short of inevitable that artists would be likened to Apelles by their admirers. This was, of course, also true in the case of Rubens.

Rubens: non sui tantum saeculi sed omnis aevi apelles dici meruit

Jan Caspar Gevaerts (Gevartius), the Antwerp humanist and close friend of Rubens composed an epitaph for the painter. It was inscribed on a stone installed in Rubens' funerary chapel in the church of St. Jacques in Antwerp.[141] It reads, in part: "Peter Paul Rubens, Knight ... Lord of Steen, who among the other gifts by which he marvellously excelled in the knowledge of ancient history and all other useful and elegant arts, deserved also to be called the Apelles, not only of his own age but of all time, and made himself a pathway to the friendship of kings and princes."[142]

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[139] Cited in David Cast, *Apelles*, 166.

[140] Roger de Piles, *The Principles of Painting*, London, 1743, 79, as cited in David Cast, *Apelles* , 166.

[141] For biographical information on Gevartius, see L. Roersch, *Biographie nationale de Belgique*, Brussels, 1880-83, vol. 7, col. 694ff., and M. Hoc, *Etude sur Jean-Gaspard Gevaerts*, Brussels, 1922.

[142] The epitaph is printed in the original Latin in H. Evers, *Rubens* , 480: D.O.M. PETRUS PAULUS RUBENIUS EQUES JOANNIS, HUJUS URBIS SENATORIS FILIUS STEINI TOPARCHA; QUI INTER CAETERAS QUIBUS AD MIRACULUM EXCELLUIT DOCTRINAE HISTORIAE PRISCAE OMNIUMQUE BONARUM ARTIUM ET ELEGANTIARUM DOTES NON SUI TANTUM SAECULI SED ET OMNIS AEVI APELLES DICI MERUIT: ATQUE AD REGUM PRINCIPUMQUE VIRORUM AMICITIAS GRADUM SIBI FECIT: A PHILIPPO IV. HISPANIARUM INDIARUMQUE REGE INTER SANCTIORIS CONSILII SCRIBAS ADSCITUS ET AD CAROLUM MAGNAE BRITANNIAE REGEM ANNO MDCXXIX DELEGATUS PACIS INTER EOSDEM PRINCIPES MOX INITAE FUNDAMENTA FELICITER POSUIT. OBIIT ANNO SAL. MDCXL. XXX. MAY. AETATIS LXIV. This text was also published by Roger de Piles, *Conversations* , 207. For a discussion of the epitaph

This was not the first time that an artist's tomb had been so marked. The tombs of Jan van Eyck and Andrea Mantegna had borne similar comparisons. The first and probably most famous example in the tradition, for such it became, was the tomb of Fra Angelico in the church of Sta. Maria sopra Minerva in Rome. It dates to 1455.

This tradition of equating artists with Apelles was probably initiated by Petrarch when he made the comparison on the behalf of Simone Martini; Boccaccio did the same for Giotto.[143] The list of such associations is long: Botticelli, Dürer, Titian, Poussin, Reni, to name but an additional few. It is therefore quite understandable, even to be expected, that the tradition lost its vitality.[144] For instance, in 1588, Antonio Moro compared himself to Apelles in a poem that he included in a self-portrait.

Though the tradition was threatened with devaluation and debasement, through too-common application, it still maintained some of its life, particularly in the light of burgeoning interest in the formal qualities of Apelles' work from the sixteenth century onwards. Dürer and Titian were both consistently and even persistantly compared to Apelles; in both cases (and this is significant for this discussion) the allusions seem to have been inspired by each artist's interest in colour.

Rubens had also, of course, often been likened to the ancient master, the parallel was seen as self-evident and came to be taken for granted. The artist's brother, Philip, made the comparison at Rubens' wedding to Isabella Brant. On the same occasion, Daniel Heinsius, a Professor of Poetics and Philology at Leiden University, claimed that Rubens surpassed Apelles. The notion of an artist surpassing Apelles, *cedat Apelles* , was part of

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and the funerary chapel, see U. Soeding, "Das Grabbild des Peter Paul Rubens in der Jakobskirche zu Antwerpen," *Studien zur Kunstgeschichte* , vol. 43 , Hildesheim, 1986, esp. 32-36.

143 See David Cast, *Apelles,* 168-169, for other references.

144 See David Cast, *Apelles,* 169, n. 7, for bibliography.

the tradition of praise. In 1612, Dominicus Baudius, also a Professor at Leiden, composed a poem on three of Rubens' paintings - *Ganymede, Venus and Adonis* and *Prometheus* - and also called the artist Apelles, this time, of the century.[145] Petrus Scriverius and Constantijn Huygens and their appreciation of Rubens has been mentioned earlier.

Rubens himself was aware of the tradition. He used motifs associated with Apelles in the decoration of his house.[146]

The adulatory comparisons between Rubens and Apelles were not only limited to the obvious parallels in their individual achievements, professional expertise and social and artistic status: socially, both enjoyed the company, and the respect of monarchs; each was admired for his artistic skill, by patrons and colleagues, both contemporary and later; each earned, through the powers of intellect and sustained labour, a reputation founded on real achievements.

It is my feeling that comparisons between the two were also made on a much subtler level. We must remember that no works by Apelles, nor any of his theoretical writings have been preserved. It is almost exclusively to the writings of Pliny that we must turn for our information about the ancient artist. Indeed, any indications of the style of Apelles' paintings, any references to his technique, and any implication of art theoretical thought is due to Pliny's account. All we have is the received reputation and the expectations imposed upon it. It is my contention that Apelles and his art theoretical importance to colour theory is a perfect metaphor for, and in fact, is intimately bound up with, the same aspect of Rubens' critical fortunes.

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[145] See Jan Gerrit van Gelder, "Das Rubens-Bild," 12.

[146] See Elizabeth McGrath, "The Painted Decoration of Rubens's House," *Journal of the Warburg and Courtauld Institutes*, 41, 1978, 245ff.

Apelles and Colour Theory

We have noted that Pliny writes about Apelles' use of a dark varnish and of the limitation to four colours only in his palette. The implication is that these four colours - basic or, to use modern parlance, primary - were used to mix all others. It is not meant to mean that Apelles limited the colours in his works to four hues. The concept of mixture is important and implicit in all discussions of four-colour, and indeed, modern three-colour theories. The belief in Apelles' use of a four-colour palette is consistently, even persistently restated. This has not been examined in its essence until quite recently.[147]

Though not our main point, a brief overview of the various four-colour theories may prove illuminating to our examination of Rubens' role in later colour theoretical discussions.

It must be emphasized that all antique discussions of colour centre on the idea of a set of basic hues and their mixture in an abstract, theoretical, way. It is only in rare instances that any reference to the practicalities of colour use in painting is mentioned.

Discussions of antique theories are complicated by the virtual impossibility of finding equivalents between languages - particularly, of course, Latin and Greek - for the precise meaning of a hue name. This is a problem that has always been noted, even in early mediaeval translations of the older texts. The difficulty is caused in part by the fact that many colour names are not abstract as such, but rather derive from the materials or objects which are considered good examples of that colour. In short, when we discuss ancient theories we may not exactly be "born blind arguing about colours" (Aristotle,

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[147] John Gage, "A *Locus Classicus* of Colour Theory: The Fortunes of Apelles," *Journal of the Warburg and Courtauld Institutes*, 44,1981, 1-26. See also, V.J. Bruno, *Form and Colour in Greek Painting*, New York, 1977; J.J. Pollitt, *The Ancient View of Greek Art*, New Haven, 1974; and, H. Jücker, *Vom Verhältnis der Römer zur bildenden Kunst der Griechen*, Frankfurt, 1950.

Physics 2.1.11), though our vision is definitely blurred. The understanding, or rather the mis-understanding, of colour names becomes important for this discussion because our modern three colour theory rests, in part, on an error in translation.

Empedocles (c. 500-c.430) assumed that there were four basic colours: white, black, red and yellow ochre.[148] He ordered each of these with one of the four elements. The correspondences are difficult to determine, white is assigned to fire, black to water, the other two pairings are disputed; red may be air, yellow ochre may be earth. Empedocles was presumably the first to name as basic those four colours that Pliny regarded as the only ones used in painting for the longest period.

Democritus (460-c.370) also named four basic colours; he, however, replaced yellow ochre with a yellow-green. Mixtures of these primaries resulted in seven other colours: yellow-red, purple, indigo, leek-green, dark blue, nut colour and fire colour. These mixed colours could also then be mixed further.

Plato's four basic colours were white, black, red and "brilliant" or "gleaming" (*Timaios* 67D-68C); the latter could be mixed with red and white to make yellow. Mixtures of the four produced a further eight colours. Plato lists the possibilities: red, black and white make purple; red-brown with the addition of black; fire-red out of yellow and gray; gray from black and white; pale yellow out of yellow and white; dark blue out of black and white; leek-green out of fire-red and black. Some of these mixtures obviously do not produce what Plato suggests. He was not interested in the practicalities of contemporary studio procedures (*Timaios* 68D). In Plato's aesthetic, colour was first and foremost an element of the "Beautiful". It, along with form and proportion, comprised the three criteria by which a painting was to be judged (*Phaidon* 100C). The work was to be

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[148] For a comprehensive survey of colour theory from antiquity onwards, see Thomas Lersch, "Farbenlehre," *Reallexikon zur deutschen Kunstgeschichte*, Stuttgart, 1937-, vol. 6, col. 157- 274.

harmonious. Unfortunately, Plato does not tell us how this colour harmony was to be achieved.

Aristotle (384-322) reduced the number of basic colours to two: black and white. They arise from the presence or absence of light (*De Sensu et sensato* 3.439b, 440). According to the philosopher, a mixture of these, in varying proportions, produced: yellow, scarlet, purple, leek-green, and dark blue. These results, he believed, could then be further mixed to produce others. The actual mechanism of mixing he explains by the belief that the created colours were the result of placing indiscernable dots of the primaries next to each other or one on top of the other, or by a fusion of the coloured materials or substances (*De sensu et sensato* 3.439b, 440a).

Aristotle was the first to arrange colours in some sort of a hierarchy or schema. White and black were at the ends of the scale; between them were arranged the other, secondary, colours according to their degrees of lightness: yellow, scarlet, purple, green and ultramarine. This arrangement was to be the standard until the seventeenth century. Similarly, Aristotle's idea about the source of colour - light - was also to be a recurring theme in later discussions, as we have seen.

Aristotle's ideas were of fundamental importance for the development of colour theories, not only for theoreticians but also for artists, even if they had not been conceived with studio practice in mind. Indeed, Aristotle held that the colours in his scale could not be produced by pigment mixture (*Meteorologica* III, 372a).

Aristotle does, however, see a relationship between colour and beauty (and the beauty of colour and some of its mixtures). Nevertheless he regarded colour as having only coincidental importance in painting; the imitation of nature was possible, in the main, through drawing (*Poetica* 4.1448b).

Theophrastus (371-287), the presumed author of *De coloribus* , names three basic colours: black, white and yellow. For him, the other hues are obtained as a result of the mixtures of these primaries in various proportions.. He also saw the colours as corresponding to the elements: white is the colour of air, water and earth; yellow is the colour of fire. Theophrastus also maintained that colours were the result of the action of light and its reflection. For him, an understanding of the nature of colour was only possible through a comparison of the reflected colour of objects not through pigment mixture.

Roman antiquity did not produce an independant colour theory as such. Galen (130-200), building on Empedocles and earlier medical ideas, proposed aligning the four humours with the elements and colours; thus, the sanguine temperament was associated with air and the colour red, the choleric with fire and yellow, the phlegmatic with water and white, and, the melancholic with the earth and black. The teachings of Galen, in this regard as well, were to have a longstanding influence. However, they did not herald any fundamental changes in theory.

Cicero's ideas can probably be taken as indicative of Roman thought when he avers that colour is of equal rank to form as an element of physical beauty (*Tusculanae disputationes* , IV, 13.31; *De officiis* , I, 36,130).

Pliny, in his discussions of colour, distinguishes *colores floridi* from *colores austeri* . The florid colours are *minium* (cinnabar), *armenium* (azurite), *cinnebaris* (dragon's blood), and *purpurissimum* (purple) (*Natural History* , 35, 12).

Pliny also contended, as we have noted, that Apelles used only four colours in his palette. He writes, *quattuor coloribus solis immortalia illa opere fecere - ex albis Melino, e silaciis Attico, ex rubris Sinopide Pontica, ex nigris atramento - Apelles, Aetion, Melanthius, Nicomachus, clarissimi pictores ...* (*Natural History*, 35,32).

Because they are not florid colours, we can conclude, as have Thomas Lersch and John Gage, that implicit in Pliny's list of Apelles' colours was an aesthetic judgement.[149] Pliny writes not so much of colours and a theory of primaries. Rather, he uses these chapters in the *Natural History* to give voice to his opinion that classical painting, with its simplicity and austere dignity, was preferable to the garish and opulent mural paintings of his own time. A similar sentiment can be read in the works of Vitruvius (*De architectura* , 7, 5), Seneca (*Epistolae* , 86,6ff.), and Petronius (*Satyricon* , 2,88,119).[150] This idea is again echoed by Franciscus Junius, who also, in his account of Apelles, remained uninterested in the palette and the use of four colours. He admired, instead, the simplicity inherent in their use.

John Gage has observed that Pliny was so intent on establishing the sobriety of the classical - of Apelles' - palette that he fell into inconsistencies in his accounts of Apelles' practice.[151] We have noted above that the colours assigned to Apelles' palette were all austere. Pliny accounted for the abandonment of the florid colours in earlier painting by saying that they were considered too vivid (*nimis acre*) (*Natural History* , 35,30). In his account of Apelles' dark varnish, however, he states that it was employed to tone down florid colours - the very colours that Apelles was said to have abandoned.[152] Gage sees this as a wilful sacrifice of consistency in order to protect an aesthetic ideal - *austeritas* . Further, he also concludes that Pliny's notions of primary colours are vague and were drawn from current ideas about the nature of colour. I am in agreement with him.

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149 Thomas Lersch, "Farbenlehre," col. 164; John Gage, "*Locus Classicus* ," 5.

150 References in John Gage, "*Locus Classicus,*" 5.

151 John Gage, "*Locus Classicus,*" 5.

152 John Gage, "*Locus Classicus,*" 5. See also Gage's note 5 on the same page for a comment on the discussion of florid and austere colours by J.J. Pollitt, *The Ancient View of Greek Art* , London, 1975.

We begin to see, once again, the use of a weighty and respected reputation in an attempt to further or to defend a current aesthetic or theoretical stance. The parallels between Apelles and Rubens and the treatment of their individual and combined reputations should thus no longer come as a surprise.

We have indicated how Apelles' fame, bearing as it did the laurel of antiquity, made his name the most appropriate for invoking a seemingly profound or learned compliment to Rubens, or to any artist. Implicit in the reference is, at times, a comparison or at least an interest in the formal qualities of the work of Apelles and the complimented artist. This is in a sense ironic, because, as we recall, none of Apelles' works have survived; they exist only as hearsay descriptions. Nevertheless, allusions to Apelles became more concrete during the High Renaissance; this, without doubt, was because of a mutual and increasingly interdependent interest and study of the classical past by both artists and scholars.

Two artistic personalities that provide good examples of what could be termed a trend are Dürer and Titian. Dürer's ideas are reflected in those of Erasmus, while Titian was associated with a circle of scholars in Venice who were involved with the publishing houses Giolito and Marcolini. Both Dürer and Titian have also been persistantly likened to Apelles, and, as Gage notes, the comparison was made because of each artist's use of colour.[153]

But Dürer was actually most interested in Apelles as a theorist. He studied what was known of the earlier master and was perhaps even inspired by his research to write his own treatise on painting. It is tempting to surmise that Dürer was prompted to pursue theoretical studies because the transmission of such knowledge from Antiquity was so incomplete. Dürer's efforts were never published. Erasmus was interested in Apelles as a

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[153] John Gage, "*Locus Classicus* ," 13.

satirist. He had edited an edition of Lucian's *Slander* in 1506. Lucian's work contained an account of the *Calumny of Apelles* ; it was the only early source of the tale. Erasmus used a print of the episode by Ambrosius Holbein as a title-page for the second edition of his *New Testament* after the first had been severely criticized.

Dürer and Erasmus met in the Netherlands on the occasion of the artist's tour of the country. Dürer recorded the image of the scholar twice during his visit. After meeting each other, Erasmus took to calling Dürer *nostrum Apellem* ; he used the sobriquet a number of times in his letters to their mutual friend, Willibald Pirckheimer.[154] Erasmus also referred to Dürer as Apelles when he praised Dürer's skill as a printmaker.[155] In the passage, he claimed that Dürer was able to obtain with one colour what Apelles did with his few. Apelles had been supreme in his day for his use of his colours; Dürer was supreme for his use of black.[156] The allusions to Apelles may imply commentary on the use of colour in the work of Dürer. Indeed, we know that Dürer was interested in simplicity of colour, particularly in the latter part of his career. This, however, does not necessarily lead to the conclusion that Dürer was interested in the four colour palette and theory in this light; rather, it would seem that the four colour palette had no particular significance for the artist.[157]

Suggestions that Apelles' theory, or rather that Pliny's account of it, could have had a direct influence on, or even interest for, artists stem from the seventeenth century. Writers saw the effects of the antique theory in the work of the Venetian artists in

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[154] As cited in John Gage, "*Locus Classicus,*" 14.

[155] This is in his *Dialogus de recta latini graecique pronunciatione* (1528), also cited in John Gage, "*Locus Classicus,*" 14.

[156] Discussion of this text is in E. Panofsky, " 'Nebulae in Pariete': Notes on Erasmus' Eulogy of Dürer," *Journal of the Warburg and Courtauld Institutes,* 14,1951. See also comments on this in John Gage, "*Locus Classicus,*" 14.

[157] John Gage, "*Locus Classicus,*"14, and n. 69.

particular. It cannot be doubted that Titian, for one, was aware of ideas associated by Pliny with Apelles.

Carlo Ridolfi, in his biography of Giorgione, was at pains to show that the artist used a range of mixtures, particularly in his flesh tones, in order to imitate nature all the better. He writes that the flesh of the figures, "which was imitated by Giorgio with a few colours adequate to the subject he undertook to express, which procedure was also followed (if we are to believe their writers) among the ancients, by the illustrious painters Apelles, Aetion, Melanthios and Nichomachos, who used no more than four colours to constitute flesh tints."[158]

Ridolfi regarded Titian as a close emulator of Giorgione; he is also, however, aware of Titian's use of blue in some instances of flesh painting. Another seventeenth-century writer, Marco Boschini, notes that Titian used a palette limited to red, black and white in his underpainting, including that of the flesh tones.[159] There seems to be little reason to doubt Titian's awareness of Apelles and his theory.

It soon became common to associate the name of Titian with that of Apelles, just as, later, Rubens' name was also to be linked with the antique artist. References abound in the writngs of the time, particularly in those of Pietro Aretino, Anton Francesco Doni and Lodovico Dolce; all of whom were exceptionally influential art critics. These three were in direct contact with the artist and all of them were familiar with Pliny's version of the Apelles story.[160] Each of them compared Titian to the ancient painter, but not one of them

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[158] Carlo Ridolfi, *Le Meraviglie dell'Arte*, 1648, ed. Hadeln, 1914, 1, 107, cited in John Gage, "*Locus Classicus*," 14.

[159] Marco Boschini, *Le ricche Minere della pittura veneziana* , 1674, 27, cited in John Gage, "*Locus Classicus*," 15. See particularly his notes 73 and 74 on the same page for discussion and further references.

[160] John Gage, "*Locus Classicus*," 15, n. 77.

made any particular reference to the four-colour theory. Aretino admired Titian's use of colour but did not connect it to a theory; Doni compared the two on the basis of of their shared skill as physiogniomists and, although he was interested in the rendering of flesh, he makes no connections with the theory either. Similarly, Dolce, although he also praises the rendering of a particular type of brown flesh tint which he attributes to Apelles; also fails to make any theoretical connection between the two artists.[161] Indeed, one can say with certainty that the four-colour theory was of no interest to Venetian painters contemporary with these writers. Otherwise, they would surely have discussed it. The use of a sombre palette would not have found favour with the Venetians - excluding blue would have been difficult to accept - and it seems clear that the four-colour palette was never an issue. Thus, Ridolfi's discussion of it also seems to be founded upon an aesthetic argument. Like Pliny's own account, it is part of a polemic against modern practice; in this case, for us a double irony, the use of "garish" colours in the flesh tones of modern artists, probably like Rubens.[162]

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[161] References are given in John Gage, "*Locus Classicus,*" 15-16.

[162] John Gage, "*Locus Classicus,*" 17.

CHAPTER IV: THEORY

Primary Colours

It is perhaps appropriate to review once again the idea of primary colours at this point, because it does have a bearing on the rest of the essay. Any investigation of primary colours revolves around the central idea that there exists a set of colours from which the whole range of visible hues can be derived. This, to reiterate, is something that we take for granted, even though in many ways the issue is far from settled. We have seen how, from the nineteenth century until today, numerous proposals for basic colour sets, varying both in number and make-up, have been proposed. The specific formulation of each group of primaries often seems to depend on whether colour was examined from the point of view of the psychologist, the physicist or the artist.[163]

The history of ideas about primary colours, which finally culminated in our modern set of three, comprising, at least in subtractive mixing, red, yellow and blue, is a complex one. It is still further complicated by the linguistic difficulties alluded to briefly at the beginning of our discussion of Apelles; in part, the establishment of our primary set rests, as noted above and as I elucidate below, on a mistranslation of Pliny's text.

I have already mentioned that colour names are often identical with the names of materials which are considered to be particularly good examples of the so-named hue; this type of identification is far more common than is the use of more abstract terms. Pliny, for his part, managed to distinguish between pigment names and abstractions: his white from

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[163] See for example F. E. Gloye, "Why are there Primary Colours?" *Journal of Aesthetics and Art Criticism*, 16, 1957/58, 128ff. See also Patricia Sloane, *The Visual Nature of Color*, New York, 1989, for a thought provoking discussion.

Milo was *ex albis* , his red from Sinoper was *ex rubris* , his *atramentum* was *ex nigris* ; of these, two designate the colour by the place of origin. The fourth colour, Attic *sil* , was to be the subject of a debate that would have profound consequences; the term *sil* was too difficult to translate with any degree of assurance.

In its apprehension of colour, the eye outstrips language every time with its ability to distinguish nuance. In fact, as we know, colour identification is always ostensive; any attempt to name a colour, without an example of that colour, is doomed to be misunderstood at the very first opportunity. It is thus an irony that modern colour dictionaries - dictionaries of colour names - make a great fuss about the exactitude of their mathematical and verbal notations. More often than not, these reference works rely on the twentieth- century organizations and arrangements of colour designed by Albert Munsell or Wilhelm Ostwald. Again, to reiterate, each of these systems must ultimately resort to a colour chip for the identification of particular hue, its value and its chroma. How much more complicated the issue becomes when we are dealing with the Latin and Greek of antique writers!

For instance, Favorinus widened his colour categories in an attempt to overcome the inherent weakness of language. His *rubor* ranged from *ostrum* (purple) to *crocum* (yellow) and gold.[164]

The writers of the Middle Ages skirted the problem; most of the literature uses specific colouring agents to designate colour rather than abstract terminology. Some of the texts do acknowledge abstract nomenclature but usually move on quickly to discussions of artists' pigments. Examples of these kinds of investigation are numerous: the twelfth-century *Mappae Clavicula*, the fourteenth- century *Liber de coloribus* , the fourteenth-

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[164] For a review and commentary, see John Gage, "*Locus Classicus* ," 17. See also Christopher Rowe, "Conceptions of Colour and Colour Symbolism in the Ancient World," *Eranos* , 41, 1972, 327-364.

century *De arte illuminandi* and Cennino Cennini's *Libro dell'Arte* , to name some of the more familiar texts.

By the early sixteenth century, some Venetian writers had complained of the confusion about colour names and about the nature and the number of basic colours.[165]

One notable feature of Venetian painting, alluded to above, was the prominence given to blue. Titian had shown an especial liking for it and the idea that it was an essential member of any proposed set of primaries began to gain ground.[166]

By error, it came to be included in Pliny's four-colour palette as the result both of the inaccuracies of language and attempts at interpretation. The mistake in translation was caused by the difficulties faced by commentators as they tried to make a precise identification of Pliny's Attic *sil.* In his *Natural History* (35, 158) Pliny writes that *sil* (ochre) and *caeruleum* (a blue pigment, probably azurite) can both be found underground in gold and silver mines. Because they had a similar source (the mine), *sil* and *caeruleum* came to be confused with each other. To add to this confusion, and to make it more difficult to correct, came the fact that a common late-Middle Age term for yellow was *cerulus* , virtually a homonym for *caeruleum* . A series of Renaissance writers continued to misidentify these pigments, with the eventual result that in the sixteenth century blue became part of Pliny's four colour palette.[167] By the second half of the sixteenth century, the fact of this error becomes important with regard to discussions of artists' paint mixtures.

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[165] Cited in John Gage, "*Locus Classicus* ," 18.

[166] Charles Parkhurst, "Camillo Leonardi and the Green-Blue Shift in Sixteenth-century Painting," *Intuition und Kunstwissenschaft, Festschrift für H. Swarzenski* , ed. P. Bloch *et al.* , 1973, 419-425.

[167] See John Gage for references for early misidentifications, "*Locus Classicus* ," 19.

Vincenzo Borghini, probably sometime after 1563, wrote a treatise on values. In it, he cites Pliny's dislike of the abuse of expensive pigments. In this context, he tries to explain the four-colour theory and finds himself in difficulties when he cannot give an equivalent for *attico*.[168]

Pierre Gregoire in the *Syntaxeon Artis Mirabilis* (1574), a French encyclopaedia, suggested that *sil* was *ianthinus* (violet). He based his idea on that of Georges Philander, an earlier commentator on Vitruvius, who thought that *sil* could be purple or yellow. Gregoire also suggested that all other hues could be mixed out of combinations of these four basic colours.

The whole discussion came under careful scrutiny in 1585 when Louis de Montjosieu took up the issue. Montjosieu tested descriptions of earlier practice by comparing them to contemporary procedures. He was not satisfied with Philander's interpretation of *sil* and states categorically that one of the four colours was blue (*unum oporteat esse caeruleum*): "For it is certain that these four colours, white, black, red and blue, are the fewest that are needed in painting, and from a mixture of which all the others are composed."[169] Montjosieu goes on to list a number of possible mixtures that make us suspect that his knowledge was no more than theoretical. However, his emphasis on the four as basic to all other mixtures is important, as is his insistance that Attic *sil* was blue. Montjosieu's ideas were to become well known during the later sixteenth and seventeenth centuries.

Around the beginning of the seventeenth century, a number of attempts to establish primary colours from which all others could be mixed resulted in the eventual establishment

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168 John Gage, "*Locus Classicus*," 19.

169 Cited in John Gage, "*Locus Classicus*," 20.

of the modern triad of red, yellow and blue.[170] One of the more celebrated of these attempts is of immediate relevance to this discussion because its author, Aguilonius, was associated with Rubens and Rubens contributed to the study. The extent of the artist's contribution is, of course, of prime interest to us. Indeed, it is at the beginning of the seventeenth century when painters and scientists first worked, briefly, together and to their mutual benefit. Robert Boyle summed it up when he wrote just after mid-century:

> ... the mixing of Pigments being no inconsiderable part of the Painter's Art, it may seem an Incroachment in me to meddle with it. But I think I may easily be excus'd... if I restrain myself to the making of a Transient mention of some few of their Practices about this matter; and that only so far forth, as may warrant me to observe to you, that there are but few Simple and Primary Colours (if I may so call them) from whose various compositions all the rest do asit were Result. For though Painters can imitate the Hues (though not always the Splendour) of those almost Numberless differing colours that are to be met with in the Works of Nature, and of Art, I have not yet found, that to exhibit this strange Variety they need imploy any more than *White* and *Black* , and *Red,* and *Blew*, and *Yellow* ; these *five* , variously *Compounded* , and (if I may so speak) *decompounded* , being sufficient to exhibit a Variety and Number of Colours, such as those that are altogether Strangers to the Painter's Pallets, can hardly imagine.[171]

Even though Boyle can be recognized as having reviewed what was known about colour at the time of writing, there was still confusion about the number and identity of the basic colours. Pliny's scheme had been thrown into confusion by the changes. We recall that Roger de Piles, at the end of the century, wrote of four capital (*capitales*) colours.[172]

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[170] V. A. Scarmilionii, *De coloribus* , Marburg, 1601; Anselm de Boodt, *Gemmarum et lapidum historia* , Hanau,1609, see Charles Parkhurst, "A Colour-theory from Prague: Anselm de Boodt, 1609," *Allen Memorial Art Museum Bulletin*, 29, 1971, 3ff. See also Charles Parkhurst, "Louis Savot's *nova-antiqua* Color Theory, 1609," *Album Amicorum J. G. van Gelderr*, The Hague,1973, 242ff.

[171] Robert Boyle, *Experiments & Considerations touching Colours,* London,1664, 219-221, also cited in John Gage, "*Locus Classicus,*" 21.

[172] Roger de Piles, *Abrege de la vie des peintres,* 131, 257-258.

During the eighteenth and nineteenth centuries, when the colour triad had become the accepted way of thinking about the primaries, the perception of Pliny's theory underwent yet another change; his ideas came to be re-interpreted in terms of the new orthodoxy. For instance, A. J. Dezallier d'Argenville's *Abrege de la vie des plus fameux peintres* has it that the new system of five primaries (including black and white) was more or less that of the of the ancients.[173] This idea was repeated by a German commentator, C. L. von Hagedorn, in his *Reflexions sur la peinture* (1775), in which he also avers that Pliny had wanted to call painters back to dignified simplicity with the restricted palette. This was, of course, a prime concern of the neo-classicists.

We have seen how from its origins, the four-colour theory, as presented by Pliny, was, in reality, a statement of an aesthetic ideal rather than a practical or even colour theoretical proposition. It was given weight by linking it to the reputation of the most illustrious painter of a long ago and lost age. Thence, each era used the authority, not only of Apelles, but also of Pliny, to fulfill its own aesthetic program. It is only when scholarly interest coincided with artistic practice, as it did briefly in the decades around 1600, that the ideas - the colour theory - attributed to Apelles by Pliny became, almost by chance, significant to the modern theory of primary colours.

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[173] Cited in John Gage, "*Locus Classicus,*" 22.

Rubens and Theory

As we have seen, Rubens enjoyed the reputation of being, during his time, the most learned of painters. It thus comes as no surprise that it gradually came to be taken for granted that his art was predicated on, or at least informed by, theory. The assumption is correct: we know that Rubens had coherent ideas that, when taken as a whole, amount to what merits being called a theory of art. Surprisingly, an attempt at identifying the exact nature of these theoretical ideas, or even one facet of them, has only been made relatively recently.

Jeffrey Muller has carefully examined the artist's writings about the theory of artistic imitation; he notes that "the magnification achieved by this focus reveals both the intricacies and the larger issues of Rubens' theory."[174] Muller uses Rubens' own writings, in this case a fragmentary essay on the imitation of antique statues, to gain an insight into the artist's thought. An idea often taken as implicit in any discussion of an artist's theory is the belief in its somehow innovative character. Such an idea is particularly attractive when considering the thought of someone reputedly as intellectually illustrious as Rubens. Muller finds that Rubens' views, as stated in the essay, place him squarely in the mainstream of the artistic thought of his period. A close review of Muller's discussion proves illuminating for this study in the light of its implications for our ideas concerning Rubens' theory about colour.

Rubens', *De Imitatione Statuarum*, is brief - only three paragraphs in length - and, although polished and seemingly ready for publication, was first printed, as we know, posthumously by Roger de Piles in his *Cours de peinture par principes* (Paris, 1708). Interestingly, the essay is believed to have been written almost exactly a century before its

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[174] Jeffrey Muller, "Rubens' Theory and Practice of the Imitation of Art," *Art Bulletin*, 64, 1982, 229-247, 229.

publication; Müller-Hofstede thinks that it was penned shortly after Rubens returned to Antwerp from Italy in 1608.[175]

De Imitatione Statuarum makes clear that Rubens looked at the past and its art in a way that was defined by Renaissance theories of imitation;[176] implicit in this is his self-knowledge, his awareness of his own position in the history of art.

Rubens holds that the artist who hopes for perfection must have a thorough knowledge of ancient sculpture as well as a profound understanding of it. The acquisition of this knowledge, however, is fraught with danger. For some the imitation of sculpture could be "the ruin of their art."[177] Statues should be used "judiciously";[178] above all, the artist should avoid giving his works the appearance of stone. This was a matter of judgement; the artist had to be able to make a "distinction between the matter and the form, the stone and the figure, the necessity of using the block, and the art of forming it." To this end it was easier, indeed necessary, to work only from good statues, bad ones would have a "pernicious" effect. "For beginners learn from them I know not what that is crude, liny, stiff, and of harsh anatomy;" artists who used them would "disgrace nature; since instead of imitating flesh they only represent marble tinged with various colours." The crude result would extinguish the subtleties of light - of luminosity - and shadow and movement that are

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175 Justus Müller-Hofstede, "Rubens und die Kunstlehre des Cinquecento. Zur Deutung eines theoretischen Skizzenblattes im Berliner Kabinett," *Peter Paul Rubens 1577-1640: Katalog I*, Cologne, 1977, 50ff.,50.

176 For Renaissance theories of artistic imitation see, Charles Dempsey, *Annibale Carracci and the Beginnings of the Baroque Style*, Glückstadt, 1977; E. H. Gombrich, "The Style *all'antica* : Imitation and Assimilation," *Norm and Form: Studies in the Art of the Renaissance*, London, 1966, 122ff; Izora Scott, *Controversies over the Imitation of Cicero*, New York, 1910. Further references in Muller, "Rubens's Theory," 229, n.6.

177 Quotations from Rubens' essay are from the English edition of Roger de Piles, *Cours...*, *The Principles of Painting*, London, 1743, 86-92, as reproduced in J.R. Martin, *Baroque*, London, 1977, 271-273.

178 On the use of the term "judicious," see Robert Klein, "*Giudizio* et *Gusto* dans la theorie de l'art au Cinquecento," *Rinascimento*, ser. 2, 1, 1961, 107ff.

a necessity of painting. Rubens' advice seems particularly poignant since we have examined the evidence of his complete mastery in the painting of carnations.

Muller has pointed out that the distinctions Rubens made, "matter and the form," and so on, are dependant in their conception on Aristotle's idea of being.[179] According to the philosopher, all perceivable and concrete things are a union of form and matter: "If then matter is one thing, form another, the compound of these a third, and both the matter and the form and the compound are substance, even the matter is in a sense called part of a thing, while in a sense *it* is not, but only the elements of which the formula consists. E. g., ... the bronze is a part of the concrete statue, but not of the statue as form." [180]

These ideas are explicit in Rubens' essay. A work of art as an imitation of nature is made by taking the form of a thing and using the materials at hand to make it. The material at hand is different from the material joined to the form in the original and is thus prone to what could be termed accidents of affect. The painter should be at pains to avoid the affects of stone when using antique sculpture to imitate nature with paint.

Rubens ideas on the importance of judgement and the distinctions he called for further coincide with another major theme in Renaissance art theory and poetics which, in turn, is a revival of a rhetorical theory of artistic imitation which finds its most comprehensive formulation in the Antique work of Quintilian.[181] Quintilian also argued for selective and careful use of the art of the past; he warned against slavish copying because it results in stagnation, and even degeneration. Mere copying killed the spirit of the original; the imitator must try to improve upon the original, because in so doing one

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[179] Muller, "Rubens's Theory," 230.

[180] Aristotle VIII, *Metaphysica* , trans. J. A. Smith, 1034b-1035a, cited in Muller, "Rubens's Theory," 230.

[181] Quintilian, *Institutio Oratoria* , reference in Muller, "Rubens's Theory," 230-231.

might hope to equal it if not to surpass it. The choice of models involved judgment. If one relied on one only, even if it was of unquestioned excellence, then one invariably took the bad with the good, for even the best of artists have faults. Besides, it was impossible to make a perfect imitation so it was to be desired that one used a multiplicity of models in order to use only the best and most appropriate elements. In short, one must first select a model suitable as an *exemplum* , and then decide which of its features are most worthy of imitation. The ability to make a wise decision depended in part on knowledge of oneself and one's shortcomings; no one is perfect or complete, but, and this is key, one should strive for perfection. These ideas make explicit that progress and evolution were not only possible, they were to be actively sought for in art.

The ideas of Quintilian, in their Renaissance revival, and the theories in Aristotle's metaphysics are the foundations of Rubens' thought as expressed in his essay.[182] The painter should use the art of the past, but must not forget that his task is the imitation of nature. Ancient sculpture can be used to this end, but cautiously; the artist must choose his models carefully and then use only the most appropriate parts of them for his work.

In the essay, Rubens, once having written of the necessity for discernment, continues with the advice that the study of antique statues cannot be carried out too carefully or assiduously; " for we of this erroneous age are so far degenerate that we can produce nothing like them." As Muller notes, this broadens the discussion to include the dynamics of the relationship of Rubens' present with the ancient past; it links artistic imitation to history.[183] Rubens continues in his musings:

> Whether it is that our grovelling genius will not permit us to soar to those heights which the antients attained by their heroick sense and superior parts; or that we are

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[182] Quintilian was also a source of inspiration to other early seventeenth-century thinkers, like Agucchi. See D. Mahon, *Studies in Seicento Art and Theory,* London, 1947.

[183] Muller, "Rubens's Theory," 232.

> wrapt up in the darkness that overclouded our fathers; or that it is the will of God, because we have neglected to amend our former errors, that we should fall from them into worse; or that the world growing old, our minds grow with it irrevocably weak; or, in fine, that nature herself furnished the human body, in those early ages, when it was nearer its origin and perfection, with everything that could make it a perfect model; but now being decay'd and corrupted by a succession of so many ages, vices and accidents has lost its efficacy, and only scatters those perfections among many, which it used formerly to bestow upon one. In this manner, the human stature may be proved from many authors to have gradually decreased: For both sacred and profane writers have related many things concerning the age of heroes, giants and *Cyclopes* , in which accounts, if there are many things which are fabulous, there is certainly some truth.

This second paragraph undermines the whole idea of progress and the idea of selective imitation. It restates a widely held theory of progressive decline.[184] Thus, the essay presents us with an incoherent, in fact implicitly contradictory, set of arguments. Even when Rubens, in the final portion of his discourse, gives reasons for this decline: "The chief reason why men of our age are different from the antients is sloth and want of exercise," and adroitly reverses the fatalism of the previous paragraph by allowing the reader to infer the possibility of improvement, the argument seems somehow still compromised.

Rubens broached two topics of major concern to his contemporaries: the notion of selective imitation and the relationship of his age to past ages. The inclusion of both reveals that Rubens was at the centre, part of the mainstream, of art theoretical thought. The theoretical position that Rubens maintained in his discussion can be seen reflected in his art. His use of the past and its art corresponded closely with the ideas stated and implied in *De Imitatione Statuarum.* To try to establish the precedence of one over the

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[184] For references to literature discussing the notion of "decline", see Muller, "Rubens's Theory," 232, n.25.

other, of theory over practice, is not useful and would serve no purpose. With Rubens, the two are inextricably bound and directed towards the same end.

We see quite clearly, in this instance, and, in a way that we can probably understand as indicative of his general thinking in theoretical matters, that Rubens' ideas were in complete accord with the prevailing notions of his age; they restate those issues that seemed important to his contemporaries.

If we now turn our attention to Rubens and his association with a colour or optical theory, we recall that the main reason that scholars have connected Rubens with colour theoretical concerns is because of his association with a leading optical theorist of his day, François de Aguilon.

CHAPTER V: *OPTICORUM LIBRI SEX...*

François de Aguilon

Charles Parkhurst noted, at the beginning of an article published in 1961, that not much was known about the life of Aguilonius. Since then a more comprehensive biography has been assembled and published by August Zigelaar S. J..[185] I have turned to these writings for most of the information that I recount about the man.

François de Aguilon, the son of Pedro de Aguilon and Anna Pels, was born in Brussels during the month of January, 1567. He was a Spaniard; his father's family hailed from a small town, Aguilon, in Aragon. He was also of noble birth; his father had served as a secretary to King Philip II during an embassy to France.

The family resided in Brussels until perhaps November, 1576, when, along with all other Spaniards, they were forced from the city as a result of a sedition instigated by the citizens of Brussels after Jacques de Glymes and the Spaniards defeated a force of Belgians at Tirlemont. It was one of the episodes in the rebellion of the Netherlands against the rule of Spain. As it did with the Rubens family, it forced the emigration of the Aguilons; in their case, probably back to the vicinity of Pamplona in Spain.

The de Aguilon family was loyal to its king. Pedro de Aguilon wrote a book dedicated to Philip II in which his feelings are made clear: *Historia del Duque Carlos de Borgona bisaguelo del Emperador Carlos Quinto* (Pamplona, 1587).[186] The family was

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[185] Charles Parkhurst, "Aguilonius' Optics," 35, n. 1, with bibliographic references. August Ziggelaar S. J., *Francois de Aguilon S. J. (1567-1671): Scientist and Architect*, Rome, 1983.

[186] August Ziggelaar, *Aguilon*, 30, for quotations.

also loyal to its Church. Young François seems to have been intended for the Church from an early age; he received the clerical tonsure at the age of ten from Cardinal de Granvella in Brussels.

Ziggelaar surmises that a family this loyal to king and Church would have welcomed the arrival of the Jesuits to Belgium.[187] This idea is given weight if one recognizes a familial connection between Anna Pels and Clara Pels. Clara Pels and her husband Jan de Cuellar, according to tradition, received St. Ignatius of Loyola on his visits to Antwerp in 1528, 1529 and1530. Jesuits had established themselves in Louvain by 1542; in Tournai by 1559; in Cambrai by 1562; Antwerp, 1570; and Maasricht, 1574. They had not settled in Brussels at the time of the family's departure.

François attended a Jesuit school - the Collège de Clermont - in Paris. This was by the year 1579; he was twelve years old. He studied Latin grammar and humanities for three years. In 1583 he moved to Douai to continue his schooling for another two years. The plague had broken out in Paris in that year and may have prompted the re-location. After completing the course in humanities, Aguilon commenced the study of philosophy which he interrupted after eight months in 1586.

The Jesuit school at Douai was expanding quickly during these years. In 1587 the Jesuit community numbered nearly eighty members and they ministered and taught over a thousand students.

The Jesuits performed pastoral work, in particular through the Sodality of Our Lady. Their efforts were rewarded annually with thirty or more students offering themselves to the order (in Douai alone). The provincial superior could only accept about twenty or so of the best at a time; consequently, fierce competitions developed. For

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[187] August Ziggelaar, *Aguilon*, 31.

example, in August, 1586, as Frans Coster was returning to Douai after a trip to Lille, he was met four miles from the town by thiry-three students pleading for admittance to the Order. The next day they organized a religious service in the parish church; it was dedicated to the Holy Spirit. After careful selection, twenty-four were admitted. Those who had not yet graduated from their studies of philosophy had their admission postponed. Thus, as Ziggelaar points out, it is of some significance that Aguilon was admitted as a first year student; he entered the novitiate in Tournai on Monday 15 September 1586.[188]

A first step in a novice's life was the Ignatian retreat of thirty days. Humble work taught humility. To this end, Aguilon was sent for a month to the College of Courtrai (15 April to 14 May, 1587); thence he also visited surrounding villages to teach catechism.

On 12 August, Aguilon was sent back to Douai to resume his interrupted studies. He was still a novice and would remain so until the required two years had elapsed before being given permission to take his first simple but perpetual vows. Aguilon, however, had taken private simple vows on 8 October, 1586; he made his public vows in Douai on 15 September, 1588.[189] At any rate, he took up his interrupted studies in logic - the first year course in philosophy - in Douai. He continued, in 1588, with the philosophy course of "physics". This was in the main limited to a commentary on the *Physics* of Aristotle, although Aguilon also had instruction in mathematics and metaphysics. (The third year philosophy course in metaphysics was only established in the Douai school in 1604.[190]) In the normal course of events Aguilon would have finished his course work in 1589. But the curriculum had been changed in 1588, when it was decided that students should pursue private instruction in mathematics before being allowed to teach philosophy on their own.

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[188] August Ziggelaar, *Aguilon*, 33.

[189] August Ziggelaar, *Aguilon*, 33.

[190] August Ziggelaar, *Aguilon*, 34.

It would appear that Aguilon benefited from the mathematical and teaching skills of Laurent Delepre, who, perhaps as a result of the recommendations in the *Ratio Studiorum* , taught mathematics in Douai for two years sometime between 1586 and 1589. Delepre was probably the first source of inspiration to Aguilon the scientist.[191]

Aguilon was awarded his Master of Arts in 1590-91, but had started teaching a year or so earlier. In September or October of 1589 he taught Latin grammar in the syntax class of the curriculum. The provincial superior evaluated his performance as "mediocriter". With the degree he was able to assume the position of assistant professor (*professor minus principalis*) under Professor Michel Viron; he taught the first year course - logic - in the philosophy program. In 1591-92 he taught the physics course while holding the same rank.

The general function or role of an assistant professor at Douai was probably somewhat as follows. It was usual for the Jesuit philosophy course to take three years; the two year program in Belgium was an exception (although it was not unique: the Jesuit college in Mainz also had a two year curriculum). It was taught by a team of three instructors: two "primary" teachers of of logic and physics; and a "medius" who lectured on ethics during the first year and on some of Aristotle's book on natural science during the second year. The "medius" also lectured on mathematics for the logic and physics students. Aguilon's role at Douai was probably similar.[192] Documentary evidence informs us that he taught astronomy.[193] Astronomy and optics were included in the mathematics course in the Jesuit curriculum. We know that Aguilon taught the "sphere" of Joannes a Sacrobosco as this was the usual way of introducing astronomy to students. It

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191 August Ziggelaar, *Aguilon,* 34.

192 August Ziggelaar, *Aguilon,* 35.

193 August Ziggelaar, *Aguilon,* 35.

was employed to teach the circles and coordinates used in describing the celestial sphere and positions in it.[194] The *spera* had been taught in mathematics courses in Rome as early as 1558, as well as in other Jesuit schools. The astrolabe served to teach the*Theorica planetarum.* We also know that Aguilon had a keen interest in mathematical instruments and their construction.[195]

As soon as he had earned his Master of Arts degree, Aguilon started his studies in theology, pursuing these in tandem with his teaching duties. At the end of the academic year1591-92, he travelled to Spain to settle family affairs. He completed his theological studies in Salamanca and received minor orders from the bishop there in 1593; it was the first step to the priesthood.

By 1596, Aguilon was back in Belgium. He was ordained subdeacon in Ghent and then priest in Ypres. For his final year of training - his tertianship - after ordination he returned to the novitiate in Tournai on 6 March, 1596. In September of the same year he was sent to Douai to be one of two professors of philosophy.

Aguilon's teaching career was short: after five years of instructing in philosophy, he left Douai to become the confessor of the Spaniards and Italians in Antwerp in 1598. The main reason for his move was probably his fragile health; Aguilonius had not been well since his days in Salamanca.[196]

Jesuits had run a college in Antwerp since 1575, with a brief hiatus between 1578 and 1585. Together with Aguilon, the college acquired a new rector, Carlo Scribani.

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[194] August Ziggelaar, *Aguilon*, 35.

[195] August Ziggelaar, *Aguilon*, 35.

[196] August Ziggelaar, *Aguilon*, 37.

Scribani was Aguilon's local superior until 1614 when Aguilon himself became rector. Scribani had by this time moved on to become the provincial superior.

Scribani and Aguilon had known each other before their postings to Antwerp. They had perhaps even known each other as boys because Scribani had lived in Brussels between 1561 and 1577. They had certainly met in Douai where Scribani had also taught philosophy at the same time as Aguilon.

Aguilon took the four solemn vows of the professed Jesuit on 2 February, 1602.

During his first decade at the college, Aguilon was its "procurator" - the financial officer or treasurer of the community; he thus was deeply involved in its financial affairs. It could not have been an easy task, for the college was always in need of monies and gifts which, however, were rare because of the difficult times. From 1600 onwards he was a counsellor to the rector, and after 1605 was also his "admonitor" and the community's "prefect of health". The duties of the latter office required him to look after the sick; Aguilon was praised for his efforts on the behalf of plague victims at great risk to himself.[197]

In 1611 Aguilon became the vice-rector because Scribani had to attend the congreagation of procurators in Rome. On 10 May 1612 the Belgian province was divided in two: one French speaking, the other Flemish. Antwerp belonged to the latter. On 23 November, Carlo Scribani became the superior of the Flemish province. He also remained the rector of the Antwerp house until 22 February 1614, at which time Aguilon assumed the position. His continued ill-health made the position a difficult one; he was succeeded by Jacques le Thiry a little over a year later on 5 June, 1616.

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[197] August Ziggelaar, *Aguilon*, 39-40.

Aguilon was kept busy. Eight sodalities of Our Lady flourished; Rubens was a member and executive of one of them, as were many other prominent Antwerp citizens. Aguilon was also responsible for the "Dutch mission" among the Calvinists. In addition, he was actively involved in the construction of the church, as we shall see.

As I have mentioned, poor health had been a constant trial since his student days in Spain. He suffered all the time from asthma and catarrh. In August of 1614, just at the time that he had become Superior, he is said to have spit blood. By February of the following year he was continuously ill, but did not receive permission to withdraw from his duties from Rome until June, 1616. He died on 20 March, 1617.

Rubens and Aguilon

Although, because there is no firm documentary evidence of any description, it cannot be stated with certainty that Rubens and Aguilon actually knew each other, however briefly, before the latter's death, it is thought that their paths could not help but to have crossed within the select circles in which they moved. And, of course, there is Rubens' work on the illustrations for Aguilon's book on optics, though Rubens, as I suggest below, would not actually have had to have known Aguilon in order to complete this latter commission.

The question of the length of their acquaintance, and the depth of their friendship is of significance to this discussion. As to the latter, we have no information, nothing written by Rubens about Aguilon, no mention even of his passing in any of the correspondence. Thus we have to proceed on the assumption that they were friends. Similarly, the length of such a friendship is also difficult to determine exactly, if at all.

After having served for a brief period as a page in the household of Madame de Lalaing, Princess of Ligne, Rubens persuaded his mother to place him as an apprentice with a painter. Rubens learned his craft in the prescribed amount of time: four years as

apprentice, then as journeyman, and finally as a master in his own right. Rubens was inducted into the guild of St. Luke in Antwerp in 1598. His teachers had been Tobias Verhaeght, Adam van Noort and Otto van Veen. All three of these artists lived long into the seventeenth century; all were eclipsed by the talent of Rubens. It would seem, however, that Rubens maintained contact with them even after he had moved ahead on his own.

In this light it is perhaps noteworthy that van Veen was the artist entrusted with the design and direction of the processional entrance for the Infanta Isabella's and Archduke Albert's entrance into Antwerp in 1598.[198] Rubens was without a doubt involved in the productions. We know that Aguilon arrived in Antwerp that same year. It would seem possible, even probable, that such an occasion would have facilitated their meeting, though, once again, this is pure conjecture.

On 9 May, 1600, a day after receiving a health certificate from the Antwerp authorities, Rubens departed for Italy to commence a sojourn that was to be eight years long. He returned to Antwerp towards the end of 1608. It seems that by this time Rubens had for a while wanted to return home, but had been unsuccessful in his attempts to be released from service at the Mantuan court.[199] The grave news of his mother's illness prompted Rubens' hasty departure from Rome on 28 October - the tenth day after his mother's death as it happens.[200] By 11 December, Rubens was back in Antwerp.[201] Rubens, with the great industry that was a hallmark of his character, set about establishing

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198 Joannes Bocchius, *Historica Narratio ... seren. Belgii Principum Alberti et Isabellae ...* , Antwerp, 1602. Reference in Hans Gerhard Evers, *Rubens* , 26 and n. 32.

199 C. White, *Peter Paul Rubens* , 50.

200 Magurn, Letter 19, 45-46.

201 A reference to Rubens' return to Antwerp was made in a letter from Dr. W. Verwilt (Antwerp) to J. de Bie (Brussels) dated 11 December, 1608, cited in Hans Gerhard Evers, *Rubens und Sein Werk: Neue Forschungen,* Brussels, 1943, 28-29.

himself in the city. He earned commissions from its leading citizens;[202] was accepted into the Guild of Romanists on 29 June, 1609 (where he was welcomed by Jan Brueghel); and was named court painter to the archdukes on 23 September. He then married Isabella Brant on 3 October, 1609.[203]

During this period, Aguilon was, as we have seen, fully engaged with his administrative duties: "procurator", "admonitor" to the rector, and the "prefect of health". We do not know how soon after Rubens return to the city the two men could have managed to meet, or, if such were the case, managed to re-establish their acquaintance.

Rubens' first formal connection to the Jesuits is attested to by the inclusion of his name in the registry of the Sodality of the Annunciation. He was a member of the council in 1623 and was made secretary in 1629.[204] During this latter year Rubens was in Antwerp for a few days only; the position must have been an honorary one.

We do not know when Rubens joined the sodality for the first time; however, it is not unlikely that he began the association soon after his return from Italy. We recall that Aguilon was responsible for the sodalities, at least by 1615. Thus, the two men may have known each other in this context.

Another date in this limited chronology that has significance for this discussion is that of a reference to Rubens' painting *Juno and Argus* (Wallraf-Richartz Coll., Cologne) which we discuss in some detail below. A letter dated 11 May, 1611 mentions the possibility of its sale.[205]

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[202] Frans Baudouin, "Rubens' Social and Cultural Background," 9-19.

[203] Hans Gerhard Evers, *Neue Forschungen* , 30.

[204] J. Rupert Martin, *The Ceiling Paintings for the Jesuit Church in Antwerp,* Brussels, 1968, 28.

[205] Magurn, Letter 22, 55, 439, n. 1.

A concrete date for a connection between Rubens and Aguilon can be inferred from the fee schedule for the illustrations for Aguilon's book on optics. Rubens provided the designs which were engraved by Theodore Galle. Galle, for his part, received a substantial payment for this work on 22 June, 1613.[206] Rubens seems to have taken some time to prepare book illustrations and frontispieces, up to six months, if a letter by Moretus is to be taken literally, because he usually carried out such work on weekends and holidays.[207] The designs could thus probably have been completed sometime earlier.

We recall that, by 1611, Aguilon had become vice-rector; Scribani was absent in Rome to attend a conference. Also, of specific interest, are the dates for the approvals for the publication of the *Libri sex*: the censor had given his approval on 9 December, 1611 and the provincial superior his on 15 January 1612. We do not know how long Aguilon worked on his text, though one presumes for quite some time , given the rigor of the demands made upon him , especially since his health was compromised. Rubens could only have been involved in the writing of the text (if he ever in fact was) before the approvals were granted. Such editorial involvement would have to have been between, at the earliest, December, 1608 and December 1611. If the *Juno and Argus* is linked to the colour theory in the book in the way Parkhurst maintains, the involvement would have had to have been at least seven or eight months earlier, given the date of the letter which mentions the painting. Thus if Rubens did make a contribution to the text it could only have been between the beginning of 1609 and the beginning of 1611. (This allows four months in 1611 actually to paint the *Juno and Argus* .)

Though the timing is not impossible, it does not seem likely that Rubens contributed to the manuscript. We recall that the years immediately after his return to

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206 J. Richard Judson, Carl van de Velde, *Book Illustrations and Title-Pages*, Corpus Rubenium Ludwig Burchard, Part XXI, vol. 1 , London, 1978, 101.

207 *C.D.R.*, 5, 335-336, Letter from B. Moretus to B. Cordier, 13 September, 1630.

Antwerp were very busy ones for the him. He entered the service of the Archduke and Duchess, and was almost immediately commissioned to complete a pair of portraits; he was involved in establishing a studio; he married Isabella Brant; he purchased a house that was in need of renovation; he worked with his brother, Philip, on a book that was published by the Plantin-Moretus press; and he was producing, between 1609 and 1612, at least seven major altarpieces, including the entire High Altarpiece of the *Raising of the Cross* .[208] In short, his time was at a premium; he was fully occupied. It is no wonder that he demanded six months to complete designs for bookplates and illustrations.

Rubens has also been associated with Aguilon during the time following the publication of the book. Aguilon was closely involved, until his death in 1615, with the design and construction of the Jesuit church in Antwerp. Rubens also contributed to this undertaking.[209] This topic, however, is beyond the immediate focus of this discussion.

OPTICORUM LIBRI SEX . . .

Aguilon published his book, a folio, *Opticorum libri sex philosophis iuxta ac mathematicis utiles* (Six Books on Optics, useful for philosophers as well as mathematicians) under the auspices of the Plantin-Moretus press in Antwerp in 1613. As noted earlier, the censor had approved the publication on 9 December, 1611 and the provincial superior had given his permission on 15 January, 1612.

As an aside, it is worth mentioning that the Plantin-Moretus press enjoyed exclusive publication rights to Jesuit works and had done so since 1593. The family was on very

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[208] For a complete list and description of these works, see the Appendix of T.L. Glen, *Rubens and the Counter Reformation. Studies in His Religious Paintings between 1609 and 1620*, New York, 1977.

[209] For a detailed account of the building of the church, see J.H. Plantenga, *L'architecture religeuse dans l'ancien duche de Brabant* , The Hague, 1926, 83ff. See also Anthony Blunt, "Rubens and Architecture," *Burlington Magazine* , 119, 1977, 609-621.

good terms with the Jesuits, indeed, a scion, Theodorus Moretus, joined the Society in 1618.

The volume is 684 pages in length and includes diagrams and, of course, illustrations; some of these illustrations are the ones designed by Rubens. In spite of its great length - one might think it ample to cover the whole of Optics - Aguilon considered it an unfinished work. It deals only with light seen by direct rays. In the preface, Aguilon promises a further study in which he will discuss reflected and refracted light - Catoptrica and Dioptrica -, but he was unable to accomplish this before his death.

Optics was a prominent part of the mathematics course at Jesuit schools. It was in a sense a culmination of mathematical studies because it was preceded by instruction in arithmetic, geometry, the "sphere", geography, planetary motion (*Theorica planetarum*) and practice with the use of the astrolabe. (This would comprise the curriculum of the whole course; it was not always offered in its entirety.)

These individual subjects had all been treated in separate textbooks prepared by Christopher Clavius, the Mathematics professor at the College of Rome from 1564 until his death in 1612. Clavius had also planned a text on Optics but was unable to accomplish this before he died. He did, however, manage to annotate a volume of the *Theoremata de Lumine et Umbra* written by Francesco Maurolico. This short work (ninety five pages) had been written in 1567 but was not published until 1611; the annotated version came out in 1613, a year after Clavius' death and at the same time as Aguilon's *Optics* .

There was thus a perceived need for a text which Aguilon seems to have attempted to satisfy. His work is, however, dense, exacting and pedantic in its treatments, and therefore was probably inaccessible to students. It seems to have been used for a time as an instructor's handbook, rather than as a text. However, it was republished twice, once in Würzburg (1685-86) and again in Nuremberg (1702).

Aguilon approached his subject with as much mathematical stringency as possible. This rigour is achieved on Archimedean principles: it is strictly deductive and allows entry to experience only through initial postulates and axioms.[210] Archimedes was the mentor to Renaissance scientists; Aguilon pursued his subject in the same spirit. However, for all that, Aguilon made an attempt to draw upon natural philosophy and to bring philosophy and mathematics together - something that was not customary.

Aguilon uses an abundance of earlier and contemporary literature in his research. He cites over fifty authors. He relies heavily on the thought of Alhazen and Vitello, the writers of the most comprehensive of mediaeval treatises on optics. He also uses the *Perspectiva communis* of John Peckham. Aristotle is cited often, as are Galen, Vesalius, Vitruvius and, of course, Christopher Clavius.

There are also notable omissions. Aguilon never mentions Johann Kepler, Friedrich Reisner, de Dominis nor Giambattista della Porta. Theories of vision are put forward in both de Dominis' *Tractatus de Radiis Visus et Lucis* (1611) and della Porta's *De Refractione* (1593). Reisner edited Pierre Ramee's *Opticarum libri quatuor* in 1606. These omissions are not serious. However, two other very important books had also appeared before the publication of Aguilon's work: *Ad Vitellionem Paralipomena Astronomiae pars optica* (Frankfurt, 1604), and *Dioptrice* (Augsburg, 1611), both by Johann Kepler.

In the first book, Kepler explains fully the functioning of the eye. He adopted the theory of Felix Platter (1583) which posits that the center of vision is on the retina. Aguilon, for his part maintains that vision is centered on the lens. Kepler is, of course, right and Aguilon's arguments are fundamentally wrong from the outset. It seems clear

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[210] August Ziggelaar, *Aguilon* , 58.

that Aguilon did not know of Kepler's work, since it is not a question of knowing the thesis and rejecting it.[211]

The *Libri sex* , in fact, begins with a study of the anatomy of the eye. Optics, we must remember, was until the Renaissance, the science of vision, not necessarily the physics of light. The problem was formulated as follows: What is the object of vision? Or: What is the intermediary between the eye and the object seen? We shall return to this.

Aguilon's explanation of the anatomy of the eye follows his own investigations and relies on (and examines critically) earlier theories. Of these, he used, perhaps, most heavily the ideas of Galen, the most famous of Greek physicians. Galen's genuine and attributed works would have been available to Aguilon in a six volume Latin translation: *Galeni Opera ex Octava Iuntarum Editione* (Venice, 1609), and, indeed, he quotes from this translation on several occasions.

Aguilon also refers to Andreas Vesalius' *De Humani Corporis Fabrica* (Basel, 1555). Similarly, he consulted the work of, and praises, one of Vesalius' successors, Girolamo Fabrici D'Acquapendente, *De visione, voce, auditu* (Padua, 1600).[212]

Vesalius had noted that many thought the retina the centre of sight.[213] In 1583, Felix Platter, a member of the medical faculty at Basel, proposed that the retina along with the optic nerve are the chief instruments of vision. Most physicians rejected this theory as did Aguilon.

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211 For a discussion of this, see Ziggelaar, *Aguilon* , 60-61.

212 For theories of vision before Aguilon, see David Lindberg, *Theories of Vision from Al-Kindi to Kepler,* Chicago, London, 1976.

213 Cited in August Ziggelaar, *Aguilon* , 65.

Ironically, although Aguilon rejected Platter's ideas, he appropriated, for his own use, the latter's anatomical illustrations of the dissection of the eye. Theodore Galle, the cutter, took the images used in Aguilon's text directly from Platter's *De partium corporis humani structura et usu libri* 3 (1583, 1604). Kepler made use of the very same illustrations in his *Ad Vitellionem* ....[214], and it was Kepler, as we stated, who made clear the whole process of vision within the eye. The lens acts as a magnifying glass; it focuses the image on the retina, the most sensitive part of the eye.

Aguilon saw the lens as the principle site of vision (*principium sensus*) (Prop. 23-26). He proposes that the lens was at the vertex of the pyramid of rays that run from every object to the eye. In order for us to see, all the rays - one from each point on the object - must converge on one point on the lens, its center - the center of vision -, and pass through it. We have to see in a pyramidal way otherwise sight would be confused by the rays emitted in all other directions from each and every point. The intensity of the rays causes a change in the size of the pupil. In this, Aguilon is in agreement with Leonardo and contrary to Galen (Prop. 17).[215]

There was a theory of vision that was opposite to this idea of intromission; it held that it was the eye that emitted rays that allowed for vision. Empedocles, whom we have had occasion to refer to, believed in an intromission theory. He said that corpuscles are emitted by objects and received into the eye. It was Plato who was the first to posit an emission theory. He thought that pure fire flows from within us through the eyes. In daylight, this inner fire is emitted and joins with it into a single body in a direct line between the object and the eye. Euclid took this idea and made it into a mathematical theory; rays having a physical dimension run from the eye to the object of vision.

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[214] Wolfgang Jaeger, *Illustrationen*, 21.

[215] August Ziggelaar, *Aguilon*, 68.

Aristotle, on the other hand, believed in an intromission theory; the eye was passive and light came to it from the object. Light was then the transparent medium made real or actual. Galen held with an emission theory. He explained that a spirit - a visual spirit - travelled from the brain to the eye and from it into the surrounding air; visual power was thus extended to see the farthest of objects.

Mediaeval philosophy, strongly influenced by Aristotle, favoured the intromission theory and managed to establish its pre-eminence over any emission theory.

However, once having answered, to their satisfaction, the question: What is the object of vision?, Mediaeval theorists formulated another that was concomitant: What is the nature of the rays themselves, be they intromitted or emitted? Alhazen held that actual forms, detached from the object, entered the eye. This notion was developed by Roger Bacon, who built upon the ideas of Robert Grosseteste about the multiplication of species. He writes that a species was not a body as such but rather, *generatio multiplicata per diversas partes medii; nec est corpus quod ibi generatur, sed fit sub dimensionibus aeris: atque non fit per defluxum a corpore luminoso, sed per educationem de potentia materiae aeris.*[216] This doctrine prevailed and became the accepted one, though acceptance was by no means universal.[217]

Aguilon accepted Aristotle's definition of light, but proposed an additional one as well (Prop. 32): *"Lumen est quod per se absque alterius praesidio sui est diffusivum ."* This definition leads Aguilon into a study of the propagation of light in his fifth book. Aguilon distinguishes between "lux" and "lumen". Lux exists in its source, lumen exists in its medium; lumen is in a sense the image of lux (Prop. 34). In addition, light is not a body

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[216] Cited in August Ziggelaar, *Aguilon,* 69. I have also relied on Ziggelaar (68-69) for the brief review of intromission and emission theories.

[217] August Ziggelaar, *Aguilon,* 69.

nor is it a corporeal quality; rather, it is what can be called an intentional quality, insofar as it exists outside its proper subject, in this case the light source. Aguilon even sees light as not unlike a spiritual substance because it is transmitted instantaneously (Prop. 34, 49). Aguilon avers the real existence of species which represent, for example, an image of the size and colour of visible objects to the eye (Prop. 43). These images are virtual qualities in that we see things - objects - not in their species but through them; we cannot see the species but rather the objects through the species (Prop. 45). The species is not the cause of vision, but rather contributes formally to vision.

In Proposition 28 Aguilon states that light and colour are the object of vision. In Proposition 39, entitled *Quinque sunt simplicium colorum species, ac tres compositae,* he lists five elementary and three composite colours: *Albus, Flavus, Rubeus, Caeruleus, Niger* and *Aureus, Purpureus* and *Viridis.* Aguilon has arranged these colours into a diagram which quickly makes his ideas about their relationships clear (Fig. 13). White and black are at the two extremes, and between them appear yellow, red and blue. All the colours are joined with semi-circular lines that indicate mixing possibilities. The diagram reveals the results of mixing red, yellow and blue, our primaries, in pairs to give the secondaries, orange, purple and green. This diagram and its accompanying text is one of the earliest written and diagrammatic explanations of a red-yellow-blue colour system.

In his text, Aguilon goes on to organise the results of mixing the intermediaries with white and black; he gives a long list of the possible tints and shades grouped under the original colours:

Yellow: *luteus, citrius, ruffus, mustelinus, ferrugineus, pullus, roanus,tanatus, regius, leonatus.*

Red: *roseus, rubidus, rubicundus, rutilus, sanguineus, gilvus, spadix, igneus, flammeus.*

Blue: *caesius* or *glaucus, plumbeus, venetus.*

Under the composite colours he lists the following:

Orange (*aureus*): *arantius, croceus, fulvus.*

Purple: *rosaceus, balasius, amethystinus, puniceus, violaceus.*

Green: *aerugineus, herbaceus, prasinus, cymatilis* or *marinus.*

In the same proposition (39), Aguilon proposes three ways of mixing colours: First by physical or real mixture of the colourants (*compositio realis*); second by the layering of colours, one upon the other so that the lower layer shines through its transparent covering (*compositio intentionalis*); and, finally, by dividing the colourants into dots so small as to be unnoticeable to the eye, yet having them mix in the eye so that a new colour is perceived (*compositio notionalis*). These three ways of mixing are not new; as we recall, they are based on the ideas of Aristotle (*De sensu*, chap. 3, 439b) and as we have seen, these approaches are the same ones that are used by painters. Thus, it must be emphasized, Aguilon is offering what is no more than a *description* of artists' practice. He is not proposing a *prescription* or a theory that accounts for it.

However, Aguilon states at the beginning of the proposition that he is writing about an abstract theory of colours; his purpose is not to write about actual colourants, *de coloribus concretis*, such as red lead, cinnabar or ochre, but rather of those colours visibly present in colourants with visible qualities. He explains by example: sealing wax contains some blue giving it a purple cast; cinnabar is nearly pure red in hue; minium has an orange cast because it contains a little yellow; mixing sandarac and minium gives a gold colour; and, sealing wax and indigo make purple. Charles Parkhurst has concluded that not only had Aguilon experimented, but he had also in some way become familiar with the types of problems faced by painters.[218] Indeed, Aguilon concludes the Proposition with: *At nulli haec ita accurate ut pictores norunt; quibus proinde hoc caput diffusus explicandum*

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[218] Charles Parkhurst, "Aguilonius' Optics," 42, 48.

relinquimus : "But nobody knows these things so precisely as painters. We leave it to them to explain these things more in detail." This tantalizing allusion has been the cause of much speculation: Rubens was involved in the production of the book and if Rubens knew Aguilon well, then the reference could be seen almost as a footnote to Rubens as the source of the mixing information. I discuss this further below, but first, in a digression, a brief overview of the book's influence in general and on colour theory in particular.

As we have noted, Aguilon's book found a place as a reference work rather than as a text in Jesuit schools. It seems that the book was quite popular for a time, but was in fact rather quickly supplanted by others because the work was both behind the times and in some ways ahead of them. Kepler's ideas were accepted relatively quickly; by 1619 we find the Jesuit Hugo Scheiner using them without reservation in his *Oculus*.[219] In addition, by 1637, René Descartes had published his ideas in his influential *Optics* .

More to the point, the colour theory put forward by Aguilon did seem to find fertile ground in the writings of the Jesuits in the years after. The most remarkable and celebrated instance is probably to be found in the colour scheme published by Athanasius Kircher, a Jesuit professor in Rome, in his *Ars Magna Lucis et Umbrae* (Rome, 1646). He has a theory of colour illustrated with a diagram that is very close in design to Aguilon's, although he does change some of the names. He makes reference to Aguilon once in his work.

Francesco Maria Grimaldi, whom I have had occasion to mention, also makes a reference to Aguilon; he directs his readers to the latter for a complete list of colours. Indeed, the list of notable writers and thinkers who mention and often praise Aguilon is substantial in length: Willebrod Snel, the discoverer of the law of light refraction studied

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[219] August Ziggelaar, *Aguilon*, 104. For the Jesuit reception in the years following publication, see Ziggelaar 104-111.

Aguilon intensively; Constantijn Huygens praised Aguilon and thought the latter capable of having discovered the laws of refraction. Indeed, Huygens had, in his youth, published a work, perhaps tellingly, entitled *Otiorum Libri Sex* (1625). Joachim Jungius used Aguilon carefully in his work on optics as well.[220] Soon, however, the book was forgotten, or at least only mentioned in passing. A notable exception is the praise given Aguilon by Goethe; he made a thorough study of colour and in it singled out Aguilon as the first to have dealt amply with the subject.[221]

Rubens and the Illustrations

I have noted that the *Libri sex* was published by the Plantin press in 1613; at the time it was under the directorship of Balthasar Moretus. Rubens' first professional collaboration with Moretus had been in 1608, the year of his return from Italy, when he provided illustrations for his brother Philip's book, *Electorum libri II* . Moretus' press published this work as well.

As we know, Rubens and Moretus had known each other well since boyhood. Their friendship dates from their schooldays in Antwerp; both had attended the *papenschool* or Latin school of Rumoldus Verdonck near the Church of Our Lady. Moretus had been a pupil from 23 April, 1586 until 22 October, 1590. Rubens was in attendance at some time during those same years and also left in 1590. Moretus went on to study with Justus Lipsius in Louvain; Rubens joined the household of the Countess of Lalaing. Moretus returned to start working for the press in 1594, at about the same time

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[220] For complete references see August Ziggelaar, *Aguilon* , 108-110.

[221] Johann Wolfgang von Goethe, *Werke* , ed. Dor. Kuhn, vol. 13, *Zur Farbenlehre*, 3rd ed., Hamburg, 1960, 531; vol. 14, *Geschichte der Farbenlehre*, 2nd ed., Hamburg, 1962, 103-105.

that Rubens began his apprenticeship to become a painter. (He became a member of the guild in 1598.)[222]

Some surviving correspondence attests to the amity between the Rubens brothers and Moretus. A letter dated 3 November, 1600, from Balthasar to Philip Rubens, reminds the latter of their joint studies with Lipsius. Philip, writing to Moretus from Rome on 17 February, 1606, included Peter Paul's regards: "My brother, with whom I am living, sends you friendly greetings." The same sentiments were expressed in other letters as well (23 June, 9 September, 1606).[223] The friendships continued for the rest of their respective lives.

The friendship between Moretus and Peter Paul, which carried over into a professional association, resulted, as J. Richard Judson has pointed out, in the transformation of the traditional design and with it the concept of the title page from its Renaissance form into a distinctly seventeenth-century type. The new form was hallmarked by subtle and complicated allegorical allusions to the text; the title page for the *Libri sex* (Fig. 15) is, as we shall see, a perfect example of the new genre.[224]

And yet, this activity - graphic design for books - was only a sideline for Rubens. He was, of course, first and foremost a painter and as such devoted his regular working hours to that activity. Designs and oil-sketches for books were created, more as a relaxing pastime than for professional gain, on weekends and holidays. Thus he preferred at least six months notice for such a commission. To wit, we have the aforementioned letter from

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[222] J. Richard Judson, Carl van de Velde, *Book Illustrations* , 25. See also L. Voet, *The Golden Compasses: A History and evaluation of the printing and publishing activities of the Officina Plantiniana at Antwerp* , I-II , Amsterdam, 1969-1972, 208, and, M. Rooses, *Petrus-Paulus Rubens en Balthasar Moretus, Eene bijdrage tot de geschiedenis der kunst,* Antwerp-Ghent, 1884, 1, 210.

[223] M. Rooses, *Petrus-Paulus Rubens en Balthasar Moretus*, 1, 213; *C.D.R.*, 334, 349.

[224] J. Richard Judson, Carl van de Velde, *Book Illustrations* , 26.

Moretus to a client, Balthasar Cordier, dated 13 September, 1630, in which he states, perhaps in an attempt to put off the petitioner, that Rubens could not consider working on a design during regular hours for less than a hundred guilders per sheet. Rubens was usually paid in the range of 20 guilders for a grisaille or drawing in folio, and correspondingly less for smaller sizes. From 1610 to 1618, he received in all 280 guilders and other considerations for his work for the press.[225]

Given all the possible relationships, it might now be said that Rubens' involvement with Aguilon's book came about as a result of his friendship with Moretus rather than (at this time) his acquaintance with, or friendship with, Aguilon. Rubens could well have produced the illustrations for the book upon Moretus' request. The book was at press in 1613; Rubens, as part of Moretus' commission would have been given the manuscript to read. Thus, Rubens' involvement with Aguilon, rather than being major, might just as well have been minimal.

For the *Libri sex* Rubens designed not only the title page but also six vignettes. These are, as Julius Held has noted as well, illustrations in the conventional sense. They refer directly to the text.[226] The book also has other illustrations and diagrams such as the series showing the anatomy of the eye taken directly from Felix Platter's work; these were engraved, probably without the input of Rubens.

We know that by 22 June, 1613, four plates for Books I, IV, V and VI had been worked by Theodore Galle; we have financial records: he was paid a total of 72 guilders for his labours. He also received another 72 guilders on the same day for engraving the title page. Rubens' payment for his work took the form of two credits payable by Moretus.[227]

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225 J. Richard Judson, Carl van de Velde, *Book Illustrations*, 27.

226 Julius S. Held, "Rubens and Aguilonius," 257.

227 J. Richard Judson, Carl van de Velde, *Book Illustrations*, 101.

Our immediate interest is the title page (Fig. 14, Fig. 15). Judson and van de Velde have provided a comprehensive description and interpretation of the piece.[228] The monumental figure of Optica dominates the page. It is perhaps more accurate to specify that the figure is Juno in the guise of Optica.[229] Juno was the daughter of Saturn, and the sister and wife of Jupiter; thus the goddess of the highest rank. Significantly, human eyelids - thus the eye and its function, vision - enjoyed her particular protection. She was also the provider of daylight.[230]

Appropriately, Rubens shows her enthroned, crowned with a diadem, in a brilliant aureole of light. She is surrounded or accompanied by objects symbolically laden with allusions to sight and vision. Divine sight and vision are symbolized by the sceptre in her right hand; it is crowned with a shining eye. Her left forefinger both points at and steadies a pyramid - the visual pyramid - that rests in her lap. These two may even be allusions to the god Apollo. Two birds flank her; to her left a peacock with a fanned tail adorned with the eyes of Argus; to her right, an eagle, perhaps a reference to human vision, or further to Jupiter. The eagle rests a talon on an armillary sphere - a reference to mathematics, Euclidean geometry (the visual pyramid can also be seen in a Euclidean light) and the science of mensuration. The three, Juno and the two birds, are framed by a pair of atlantean terms supporting an architectural surround. Two lamps - a reference to some of

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[228] J. Richard Judson, Carl van de Velde, *Book Illustrations,* 102-105. See also Wolfgang Jaeger, *Illustrationen,* 15-17.

[229] Justus Müller-Hofstede, "Non Saturatur Oculus Visu - Zur "Allegorie des Gesichts" von Peter Paul Rubens und Jan Brueghel d. A.," Herman Vekeman, Justus Müller-Hofstede, eds., *Wort und Bild in der Niederländischen Kunst und Literatur des 16. und 17. Jahrhunderts,* Erftstadt, 1984, 243-289, 263.

[230] Rubens probably recalled the writings of J. Piero Valeriano, *Hieroglyphica,* Basel, 1575, Book 23: *JUNO. Id quoque mihi videtur observatione dignum ... Oculi superius integumentum in tutela Junonis esse, quod eo protegantur oculi, per quos luce fruimur, quam ad Junone tribui putabant ...,"* cited in Justus Müller-Hofstede, " Non Saturatur Oculus Visu," 246. See also K. Renger, cat. exh. *Rubens in der Graphik,* Göttingen, Hannover, Nürnberg, 1977, 58-60; and, H. Kauffmann, *Peter Paul Rubens. Bildgedanke und Künstlerische Form,* Berlin, 1976, 18.

the light experiments elucidated in the book? - sit atop the architecture, one to each side of Juno.

The terms reinforce the optical theme. On the left, Mercury holds the many-eyed head of Argus. This is a reference to Ovid's story[231] where Mercury lulled Argus to sleep and then killed him. Mercury is appropriate for the title page, not only because of the optical theme of this particular story, but also because he is often associated with reason and good sense.[232]

Minerva, on the opposite side, is also associated with reason and good sense. She carries a spear and a shield adorned with the head of Medusa. The meaning probably follows Ripa's *Iconologia* where the Medusa head symbolizes reason over the senses.[233]

The socles below the terms contain two interesting iconographic images: dog-headed apes (*cynocephali*). Their source is also in Valeriano's *Hieroglyphica* ; the dog-headed ape loses its sight when the sun displaces the moon and regains it when the moon is once again visible. On the left the beast is on its back in daylight; on the right it stands heraldically erect with raised paws as the new moon becomes visible.[234]

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231 Ovid, *Metamorphoses*, 1, 625.

232 G. de Terverant, *Attributs et symboles dans l'art profane, 1450-1600, Dicire d'un langue perdu*, I-III , Geneva, 1958-1964, II, col. 269.

233 C. Ripa, *Iconologia* , Rome, 1603, 426. See also W. Friedlaender, *Caravaggio Studies*, Princeton, 1955, 88.

234 P. Valeriano, *Hieroglyphica*, Lyons, 1586, Book 6, 53.

CHAPTER VI: TWO PAINTINGS

Juno and Argus

As I have noted, Rubens explored the story of Juno and Argus in an eponymous painting (Fig. 16). It was Charles Parkhurst who first examined and wrote of this work in the light of the optical, and the colour theories outlined by Aguilon.[235] He writes, "no one has pointed out that d'Aguilon informed himself on Rubens' colour problems and wrote *in extenso* about them in his book, and that Rubens, in at least one painting, deliberately made a demonstration of the color theories published by d'Aguilon."[236]

Rubens' *Juno and Argus* was completed sometime before 11 May, 1611. This exact date for a *terminus post quem* is provided by the letter in which Rubens mentions that an opportunity for its sale has presented itself.[237] Hans Hupp, in a study that is still considered basic, dates the work convincingly to 1610; an earlier date of 1609 had been proposed but has been rejected.[238]

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[235] Charles Parkhurst, "Aguilonius' Optics," 35-49. For discussions of the colours in the painting, see Lorenz Dittmann, "Versuch über die Farbe," 44-45, and Hans Kauffmann, *Peter Paul Rubens, Bildgedanke und künstlerische Form, Aufsätze und Reden*, Berlin, 1976, 18.

[236] Charles Parkhurst, "Aguilonius' Optics," 35. Michael Jaffé has proposed that Rubens didactically applied Aguilon's theory in a painting of the *Annunciation to the Virgin* (Vienna): Michael Jaffé, "Rubens and Optics: Some Fresh Evidence," *Journal of the Warburg and Courtauld Institutes*, 34, 1971, 362-366. For a discussion of this article, see Julius S. Held, "Rubens and Aguilonius: New Points of Contact," *Art Bulletin*, 61, 1979, 257-264.

[237] Magurn, Letter 22, 55.

[238] Hans W. Hupp, "Das Argusbild des Peter Paul Rubens in der Kölner Galerie," *Festschrift für Karl Koetschau*, Düsseldorf, 1928, 118-129. For the dating see p. 123, for the proposal of an earlier date see p. 128, n. 10. Svetlana Alpers has described the article by Hupp as basic: Svetlana Alpers, "Manner and Meaning in some Rubens Mythologies," *Journal of the Warburg and Courtauld Institutes*, 30, 1967, 272-295, 291. For a discussion of the painting see also, H. Vey, A. Kesting, *Katalog der Niederländischen*

The painting, as it is preserved is still large, although somewhat smaller than its one-time dimensions of 2.60 m by 3.51 m. Indeed, as Hupp shows the format of the painting around 1610 was square.

The original image showed Juno in her chariot, sprinkling the eyes of Argus over the tails of her two peacocks. Iris, identified by a rainbow over her head, assists. It is she who holds the severed head of Argus and plucks the eyes from it with forceps. The headless corpse is sprawled at the bottom of the composition. A youthful figure sits in the chariot at the very right of the painting. Her identity is unclear though it has been proposed that she be seen as Io or Syrinx.[239] Both names are unconvincing and seem somewhat questionable. Io has no place in the presence of Juno, indeed, the goddess caused her to be plagued by flies, whilst still a white heifer. She did not regain human form until she had reached Egypt after crossing the Bosporus. The nymph, Syrinx, would also not have had a human form at this time; she had been turned into reeds, from which Pan made his pipes. Mercury used the syrinx to lull Argus, so there is no reason to assume that she would have taken part in the episode in any other guise. (See Ovid, *Metamorphoses* , I, 568-733, 691, respectively.)

Sometime in 1614 or 1615, Rubens extended the painting on the left by half a meter.[240] (The extension was then narrowed at a later date, perhaps during the eighteenth century.) The addition was filled with three putti who seem to be making mischief, as is the wont of the species; one of them is breaking a feather from the tail of a peacock. It was determined that this addition was by the artist's hand and thus remains. However, two

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Gemälde von 1550-1800 im Wallraf- Richartz - Museum, Cologne, 1967, 95 ff., no. 1040.

239 Charles Parkhurst, "Aguilonius' Optics," 37.

240 Hans Hupp, "Das Argusbild," 120-121. We do not really know when the work was sold; for Rubens to have amended it four or five years later might indicate that the buyer was close or at least in touch with the artist at this time (1614/15).

other, spurious, strips of canvas, one, on the right, originally measuring half a meter, and, one across the top, somewhat narrower in width, have been removed. Hupp explains these additions and the narrowing at the left as a result of a change in taste, specifically a neo-classical aesthetic. They are seen, by him, as honest efforts which were meant to be constructive rather than as acts of vandalism.[241] If one stops to consider, one can see in these well-meant changes the concrete counterpart to what can befall an artist's reputation. The work was "improved" to conform with changing time and taste, rather than simply to increase its intrinsic worth. Still, the unfortunate upshot is an obscuring of the artist's original intent and ideas.

The painting is executed in a manner which Svetlana Alpers has described as an "allegorical mode" rather than a dramatic one.[242] She bases her evaluation on an extensive examination of the way Rubens treated and presented mythological subjects during these years. Juno decorating her peacock's tail is an unusual episode in the story, as well as an unusual subject in art. Alpers notes that Rubens further emphasized this particular scene by quite consciously distinguishing it from the main events of the myth; he omits Mercury and, we assume, Io, the agent and the cause of the event.[243] The action is arrested; the image is strangely static. Argus' body is separate from the action, almost discarded at the bottom of the composition. There is no logical reason to add Iris, the putti nor the mysterious figure in the chariot; these form a group around a seemingly inactive Juno, who stands monumentally and somewhat formally at the centre of the episode. A formal aspect of the composition pointed out by Parkhurst suggests that Juno and Iris as figural types are reminiscent of images of Judith.[244] Just as one senses in some depictions of the

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[241] Hans Hupp, "Das Argusbild," 126.

[242] Svetlana Alpers, "Rubens Mythologies," 291.

[243] Svetlana Alpers, "Rubens Mythologies," 291-292.

[244] Charles Parkhurst, "Aguilonius' Optics," 37-38.

Judith and Holofernes story a certain emotional neutrality, so it is in this painting: murder has been rendered harmless. The question arises, what was Rubens trying to convey?[245] Parkhurst, in his discussion of Aguilon's theories, concludes that the picture is not a simple narrative account of one episode in the Argus story. He interprets it rather as having an optical subject. Further, the image is pointedly about light and colour and, specifically, about Aguilon's theories.

In examining the colours and their mixture, Parkhurst recognizes a congruency with the theories outlined by Aguilon. He remarks on what, to him is a striking feature of the work: its coloring predominated by a triad composed of red, yellow and blue. Juno is clad in red; Iris wears blue, and the embroidery of Juno's cloak and the chariot provide the yellow. These three are mirrored in the rainbow over Iris' head. This arc also has the secondaries: orange, blue-green and violet. Parkhurst identifies the two achromatic colours, white and black, with the lights and darks found in the highlights and shadows respectively. In short, the simple and composite colours are present. Parkhurst also sees examples of the use of the colour mixing principles along the Aristotelean lines adopted by Aguilon - *compositio realis, intentionalis* and *notionalis* . He notes examples of these techniques particularly in the skin tones, which are melanges of simple and composite colours, sometimes complexly layered, and, throughout the work, ranged in small distinct, patches of paint, in what we recognize as Rubens' manner. In the *Juno and Argus* the skin is painted with pink, gray, yellowish white highlights and gray-green (terre verte) shadows. There is an abundance of green in the skin of the corpse which gives it its particularly cadaverous tone.[246]

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[245] Perhaps in this work, Rubens was also subscribing to notions of *obscuritas* as often dictated by sixteenth-century emblem theory.

[246] Charles Parkhurst, "Aguilonius' Optics," 46. See also Martin Kemp, *The Science of Art* , 276.

It is true that the subject of the painting is not just a simple narrative of the Argus story, similarly, even though it reveals a curious lack of drama, it is also not a simple account of how the peacock gained its distinctive tail feathers.[247] It does seem clear that the subject is of an optical or visual nature, particularly since it is linked with the iconography found in Rubens' title-page for Aguilon's book. However, we must be cautious in assigning a specifically colour theoretical interpretation to the work, or even linking it too directly, in a causal way, to Aguilon's *Libri sex*. In the first instance, if the picture was painted in 1610, we cannot at all be sure that Rubens, so soon back from Italy and so preoccupied with establishing himself in Antwerp, would have had any significant time to devote to Aguilon's theory. In addition, we have argued that the two men may not even have met by this date, and that Rubens' involvement as illustrator for the *Libri sex* may have come about later in 1613, when his friend Moretus (who had the manuscript for printing) could have asked the artist for the needed illustrations. Similarly, Aguilon was so caught up with his official Jesuit duties that he would also not have had much opportunity to discuss colour theory in any significant way with Rubens. And, thus finally, we cannot really make that much of any visual connection between this painting and the title-page featuring *Optica*, since perhaps three years separate these two works.

In short, we have no direct evidence that Rubens used Aguilonian precepts to guide his painting, nor can we say categorically that Aguilon's synthesis of earlier ideas relied upon Rubens' input. The visual nature of the title-page was, of course, appropriate, and the optical subject of the *Juno and Argus* of interest to Rubens. The congruency is perhaps serendipitous, rather than planned; the iconographic vocabulary, however, would have been the same in either event. This is perhaps made more apparent if we turn to and examine another work of an optical nature that saw the involvement of Rubens in its production: the *Allegory of Sight* (Prado, Madrid) (Fig. 17), one of five paintings in a

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[247] Svetlana Alpers, "Rubens Mythologies," 292.

cycle devoted to the five senses painted in a collaboration between Jan Brueghel the Elder and Rubens sometime during the years 1617 to 1618 (thus not far removed in time from both the title-page and the *Juno and Argus* in date of execution, but, by its date alone, indicative of a long standing interest in optics on the part of the artist). An examination of this work in conjunction with the title-page and the Argus painting illuminates more brightly the meaning of each.

The Allegory of Sight

The *Allegory of Sight* has most recently and most thoroughly been discussed by Justus Müller-Hofstede.[248]

The painting is recognized as a joint effort of Rubens and Brueghel; therefore any discussion of the painting must begin with an attempt to identify their individual roles in not only the conception, but also the execution of this work, and indeed, the cycle.

Müller-Hofstede has suggested that the cycle was commissioned from the artists, perhaps to honour them, by Albrecht and Isabella in the two weeks (13 August - 27 August) that they were in Antwerp during the late summer of 1615.[249] During their visit they had seen Rubens' works in the collection of his friend Cornelis van der Geest and had also been made a gift of four paintings by Brueghel by the city of Antwerp. Rubens, for his part, had commissioned printed portraits of the couple from Jan Muller; these also appeared in 1615.[250] We do not have any details of the commission, and significantly, we

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[248] Justus Müller-Hofstede, "Allegorie des Gesichts," 243-289. See also K. Ertz, *Jan Brueghel der Ältere (1568-1625). Die Gemälde mit kritischem Oeuvrekatalog*, Cologne, 1979, 332-348.

[249] Justus Müller-Hofstede, "Allegorie des Gesichts," 243.

[250] Müller-Hofstede also suggests that the work may, even at the time of its commission, have been intended as a political gift for Herzog Wolfgang Wilhelm von Pfalz-Neuburg, a new ally: Justus Müller-Hofstede, "Allegorie des Gesichts," 245.

have no way of determining whether either of the artists was given prominance in its award. However, even a cursory examination of the picture - the obvious complexity of its conception - taken in conjunction with our knowledge of Rubens, leads us unhesitatingly to assume that, he, rather than Bruegel, should be seen as the intellectual force responsible for the execution of the cycle. The work, I think, is an expression of Rubens' ideas and as such we can treat it, at least iconographically, as his.[251] It may thus be compared to the title-page and the Argus picture without worrying about the influence of diverse intellects.

The two figures in the painting are Juno and her companion, a putto.[252] Juno is draped in a blue cloak; on her head she wears a diadem set with pearls, rubies and an agate. This is the same piece of jewellery that crowns her head in both the title-page and the Argus picture. For this piece, as for the previous two, it is safe to conclude that Rubens relied on the writings in J. Piero Valeriano's *Hieroglyphica* (Basel, 1575) for iconographic inspiration. Perhaps the guise that Juno assumes here is closer to that of *Visus* than *Optica* but the essentials remain the same.

The two figures are shown seated in the midst of an awe-inspiring collection of *objets d'art* , paintings, sculptures and scientific instruments.[253] Juno looks langourous or even wistful; her posture - *caput manui innixum* - has been recognized as reminiscent of *Melencholia.* [254] The dog at her feet and the putto amplify this allusion. If Juno is meant to be melancholic in aspect, the humour has not resulted in complete paralysis; she raises her

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[251] Justus Müller-Hofstede, "Allegorie des Gesichts," 246.

[252] K. Ertz has identified them as Venus and Cupid (K. Ertz, *Jan Brueghel der Ältere,* 343-346). Justus Müller-Hofstede has convincingly countered this (Justus Müller-Hofstede, "Allegorie des Gesichts," 246, 277 n. 25).

[253] For discussions of picture galleries and collections in the seventeenth century see: M. Winner, *Die Quellen der Pictura-Allegorien in gemalten Bildern des 17. Jahrhunderts in Antwerpen* Phil. Diss. Cologne, 1957; U. A. Haerting, *Studien zur Kabinettbildmalerei des Frans Francken II. 1581-1642,* Hildesheim, Zurich, New York, 1983.

[254] K. Ertz, *Jan Brueghel,* 344.

right arm, and in so doing effectively draws our attention to the object of her gaze. Juno is actively involved in the act of seeing in a way different from that illustrated in the other two images.

She regards a small panel held up for her by the putto or genius. The image on the panel is of an optical subject as well; the painting within a painting, with its parallel subject matter, emphasizes the overall subject by its own very self-referential theme. The panel's subject is Christ healing the blind (John 9, 1-7; Mark 8, 22-25). Christ touches the eyelids of a blind man and restores his sight, in all senses of the word; He allows him to see the light (Mark 10, 52).

Müller-Hofstede regards this - the act of seeing and the seeing of the light - as the central motif of the painting and the key to its understanding.[255] The meaning is expanded or completed by a second picture within the picture, this one a little to the right and to the rear, just above the putto's head: *The Blind leading the Blind*. (It does not seem to be a recognizable work, although it looks somewhat like a Brueghel workshop production.) Muller-Hofstede sees the two, the *Healing of the Blind Man* and the *Blind leading the Blind*, as antithetical. He interprets the theme as seeing *in bono* and *in malo*. These two opposites together with Juno-*Visus*- *Optica* give the whole painting an emblematic structure: the *inscriptio* is the figure of Juno; the *explicatio* is found in the two pictures within pictures. They are the key combination in the composition and through them we can find related meanings for the other elements in the painting. Although the emblematic structure rests on this group, it is not easily discernible. Only with the examination by Müller-Hofstede has it been recognized correctly in all of its aspects. This, in an ironical turn of events, is probably the direct result of Rubens and Brueghel taking delight in another emblem theoretical notion favoured in the seventeenth century, one I have alluded

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255 Justus Müller-Hofstede, "Allegorie des Gesichts," 247-249.

to earlier, *Obscuritas* : a planned veiling of connection to titillate through puzzlement. The seeming randomness of the arrangement of the objects, which bring their own delight at discovery to the viewer, is actually strictly conceived to provide a more subtle pleasure for the attuned intellect.

Vision, the act of seeing , is also treated in an hierarchical way in the painting.[256] The hierarchy begins with the monkey in the foreground; he squats, eyeglasses in hand, to look at a painted seascape. As H.W. Janson, among others, has pointed out, the ape is one of the oldest symbols of mindless imitation (*imitatio insipiens*).[257] In this context, it makes manifest the worst kind of sight, "looking without seeing," looking at the surface of things without seeing or understanding them. The monkey also holds eyeglasses; these symbolically are often interpreted negatively; they give false images, making clear sight even more difficult. They are also emblematic of spiritual mindlessness. This could be seen as another example of serendipity, given that Galileo, the most eminent and notorious user of telescopic lenses was at odds with the Church as a direct result of their employ. In a similar vein, we can note that, eyeglasses have most often been associated with the misuse of sight exemplified by the vice of *Curiositas.* Nonetheless, they also have a positive aspect; they allow the viewer to penetrate or magnify matters in a way that reveals the truth.[258]

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[256] Justus Müller-Hofstede, "Allegorie des Gesichts," 261-264.

[257] H.W. Janson, *Apes and Ape Lore in the Middle Ages,* London, 1952, 33, 89ff., and other examples.

[258] See Hans Joachim Mette, "Curiositas," *Festschrift Bruno Snell zum 60. Geburtstag* , Munich, 1956, 225-235. For a discussion of eyeglasses and, indeed, for an introduction to art and physically compromised vision, see: Patrick Trevor-Roper, *The World through Blunted Sight,* New York, 1970.

There is another sly reference to seeing and to imitation in this vignette of the monkey with the seascape.[259] The monkey regards a scene that is simple and insignificant in the sense that it is an image of ships anchored in a calm sea, not a battle or a tempest. In addition, the image could also be a reference to a theme that has been traced by Janson in the book cited above: *ars simia naturae* . This was first regarded in a positive light, and then, during the late *Cinquecento* and after 1600 became more of a condemnation rather than praise. Exact description and mindless imitation of nature was seen as being without *inventio* and lacking an *idea.*[260] This allusion is particularly apt in this discussion considering, as reviewed earlier, Rubens' own thoughts on imitation and its pitfalls.

In accord with then current thinking, Cesare Ripa, in his *Iconologia* (Rome,1599,1603), in his allegorical personification of *Imitatione* (in painting), adopts the image of a female figure with brushes in one hand and a mask in the other; she controls an ape with her feet.

We see that the monkey, the representative of the lowest level of sight, can suggest two ideas: bad or incorrect seeing and mindless imitation. Whichever interpretation is chosen, both are clearly separate from the next level or tier in the hierarchy.

A telescope is prominently placed between Juno and the putto. It is a sophisticated looking instrument supported on its own stand; it immediately draws the viewer's gaze, not only because of its position between the two principal figures, but also, at least for contemporary viewers, because of its novelty. A second telescope is included in the painting on the floor behind the putto. Significantly, this second device has attracted the attentions of a second monkey. As with the eyeglasses, and perhaps more overtly, we are

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259 Justus Müller-Hofstede, "Allegorie des Gesichts," 262.

260 For a discussion of the gradual change in the notion of the *idea* , see, E. Panofsky, *Idea. Ein Beitrag zur Begriffsgeschichte der älteren Kunsttheorie,* 2nd. ed., Berlin, 1960, 33ff. and 39ff.

led to assume a dual aspect to any interpretation of the meanings of the telescope. Any real or symbolic associations with the instrument would have been particularly potent to the seventeenth- century viewer. It was a new technological development of profound scientific and philosophical importance, and its prominent inclusion in this painting dating to about 1617, makes it one of the earliest illustrations of a spy-glass in a work of art. The earliest example of the telescope , or more correctly, its influence in visual art, dates to 1612; Ludovico Cigoli's fresco of the *Ascension of the Virgin* in the Cappela Paolina in Santa Maria Maggiore in Rome depicts the Virgin standing on a moon that is the copy of the image Galileo saw and published in his *Sidereus Nuncius* in 1610.[261]

The development of the telescope rests on theoretical speculations on magnification that go back to Alhazen and Roger Bacon; it was first constructed around 1608. Its actual invention cannot be credited to one individual with any certainty since it now seems likely that a number of instrument makers in the north - the Lowlands - developed the idea independently at the same time. On the 2 October, 1608, the optician, Johann Lippershey, applied for patent for his invention from the city of Middelburg, Seeland. The application was denied on the grounds that he was not the only one building them. One of his competitors, Jakob Adriaanszoon tried for patent, also unsuccessfully, on 17 October, 1608. Apparently during that year, a "Belgian" was selling telescopes at the Frankfurt fair. The whole issue of who invented the telescope is vexed and was at times polemic in the tone of its discussions. Perhaps noteworthy for us is the fact that Johann Kepler came up

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[261] Erwin Panofsky, *Galileo as a Critic of the Arts*, The Hague, 1954, 5ff. Earlier representations of what appear to be telescopes are more properly called viewing- or sighting-tubes (*fistula*) insofar as they did not have lenses. The name *telescope* was coined at the Accademia dei Lincei in Rome in 1611: Edward Rosen, *The Naming of the Telescope*, New York, 1947.

with a new design in 1611 after having seen one of Galileo's instruments; it was first constructed by Christian Scheiner S.J. in 1613.[262]

Interpretations of the meanings of the telescope are essentially the same as those for eyeglasses; the invention of the latter was quite naturally the first step in the development of the former, and thus it is only to be expected that iconographically they are recognized in similar fashions. The telescope was also seen negatively as a symbol of inordinate curiosity as well as more positively insofar as it, like eyeglasses enlarged, magnified and consequently provided a penetrating, more revealing view. The monkey is likely a reference to the vicious use of the telescope, the spy-glass on its stand is probably its positive aspect.[263]

In his proposed hierarchy, Müller-Hofstede sees the telescope as a symbol of scientific vision or observation. As such, a contemporary viewer would unerringly associate it with Galileo, the first one to use it for astronomical observations the results of which he had published only a few years before the painting was completed in the *Sidereus Nuncius* (1610). Scientific seeing is obviously elevated and above the mindless sight of the monkey. However, it is still below the enlightened vision made clear by Juno's regard of the *Healing of the Blind*. Indeed, by its placement and the direction of its aim; by the fact that it is disregarded by Juno, Müller-Hofstede sees a veiled allusion to the deepening rift between Galileo and the Church. The telescope may allow magnified, and thus clearer, vision, but it was not meant to penetrate - symbolically - the heavens which were the domain of God and the theologians.[264]

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[262] Paul Adolf Kirchvogel, Adriaan Willem Vliegenthart, "Fernrohr," *Reallexikon zur deutschen Kunstgeschichte*, Stuttgart, 1937-, 6, col. 257-276, 258-259. See also, H.H. Mann, *Augenglas und Perspektiv*, Berlin, 1992.

[263] For a review of the meanings - as attribute, allegory and symbol - see: Adriaan Willem Vliegenthart, "Fernrohr," col. 263-276.

[264] Justus Müller-Hofstede, "Allegorie des Gesichts," 262-263.

It was in large part due to the observations of the night sky by Galileo and the conclusions they led him to, that the Church's conviction of the geocentricity of the universe became less sure, in spite of the fierce defence mounted by the theologians. Somewhat surprisingly, Galileo was heartily welcomed in Rome in the spring of 1611; he was honoured by Cardinal Bellarmin and the other Jesuits in the College. However, in the years following, this good will was sacrificed.

Galileo was vocal in his support of the Copernican system. He was successful in his refutation of some of Aristotle's tenets in natural philosophy. These and the widespread dissemination of the contents of a letter which he had written to the Grand Duchess Christine von Lothringen, the mother of Cosimo II, in which he propagated ideas about the compatibility of the teachings of the scriptures and the Copernican sytem, led to the first warnings from Rome. A second visit to Rome saw the contents of his work discussed by the Index congregation. In March, 1616, Galileo was formally asked to desist from publicly propagating any ideas about a Copernican, heliocentric cosmos.

This was the first step in a continous argument that led to Galileo's eventual condemnation in 1633. The debates between Galileo and the Church that occurred between 1610 and 1616 were known throughout Europe and must have been followed avidly in centres of intellectual learning like Antwerp. The *Allegory of Sight* , painted in 1617 or 1618, may contain an allusion to Galileo's predicament.

It is not unlikely that Rubens not only knew of Galileo's work, but also valued it. He may also have shared with him a Copernican view of the universe.

Possibly, the two men may have met briefly in May, 1604. Rubens was in service with Vincenzo Gonzaga in Mantua; Galileo was engaged in negotiations - unsuccessful as it

turned out - for the position of court astronomer with the Duke.[265] In the end, however, we have no record of their early association, if indeed there was one. But Rubens' curiosity would, in any event, have been stimulated by the publication of the *Siderius Nunceus*. This interest may have been further encouraged while Rubens was working on the plates for the *Libri sex*, even if the former was a physical text and the latter more physiological in content. We do know that Rubens' had great respect for the scientist as Peiresc, Rubens' and Galileo's friend, wrote to the latter that the artist held him in great esteem.[266]

Scientific interest notwithstanding, if we adhere to Müller-Hofstede's hierarchy, we see that in an iconographic context scientific vision as symbolized by the instrument is on a lower level than the enlightened vision made manifest by Juno looking at the *Healing of the Blind*. By extension, if we look again at the title-page, we see the same iconographic vocabulary in its essence: divine sight in the eye on the sceptre; human sight in the eagle; and, scientific sight represented by an array of instruments. The same instruments, with the addition of the telescope are scattered in the painting. It is perhaps not inappropriate to infer, even though no direct evidence exists, that the title-page also subordinates scientific observation and vision to spiritual enlightenment. The details of this kind of discussion, though seemingly not directly relevant to this thesis, are nonetheless important and are in need of consideration. The subtlety of the iconographic constructions in each of the images - the title-page, the *Juno and Argus* and the *Allegory of Sight* - along with the intellectually sophisticated references to the philosophy and science of optics make manifest Rubens' acute awareness - a professional necessity - and interest in the subject. We do not know whether his interest was stimulated coincidentally by Aguilon's manuscript, and in fact,

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265 *C.D.R.*, 1, 248ff. See also Francis Huemer, "Rubens and Galileo 1604: Nature, Art, and Poetry," *Wallraf-Richartz-Jahrbuch*, 44, 1983, 175-196.

266 *C.D.R.*, 1, 64.

determining this is not of fundamental importance. The date of the *Juno and Argus* and its position in the context of the subject matter of his work during this period have led scholars, as we have seen, to both conclusions.[267]

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[267] See once again, Svetlana Alpers, "Manner and Meaning," 272-295.

CHAPTER VII: EVIDENCE

Evidence for a Colour Theory

As I have discussed at some length above, Charles Parkhurst views the *Juno and Argus* as a conscious and considered illustration of Aguilon's published colour theory.[268] However, none of the three images contain any elements that could be construed as overt references to colour theory; there is no iconographic nor thematic allusion to colour *per se* . But Parkhurst, again, as noted earlier, has proposed a more subtle association to the *Libri sex* ; he suggests that Rubens' choice of the principal colours in the Argus picture was predicated on the scheme described and rendered by Aguilon. Parkhurst's ideas and arguments are presented persuasively; nevertheless, he is quite correctly cautious in his conclusions. He assumes, however, that Rubens did indeed have a colour theory and thus proceeds to demonstrate the points of contact between Aguilon, the scientist, and the artist. He enumerates some of the problems that the association raises. He writes:

> We would like to know, for example, with whom the antecedence lies: whether the colour notions expressed by d'Aguilon, and carried out by Rubens in his painting after the model of the text, are really the work of that scientist, or whether, on the contrary, they were handed complete to the scientist by Rubens. If they were Rubens', then had he worked them out for himself, or got them from some earlier source, such as Mantegna, or the Italians like the Carracci, or perhaps from Elsheimer in Rome or Italian theorists, or from commentators on Aristotle? Or had, indeed, the painter and the scientist worked them out collaboratively in Antwerp? If they were d'Aguilon's, what sources was he exploiting?[269]

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[268] Charles Parkhurst, "Aguilonius' Optics," 35.

[269] Charles Parkhurst, "Aguilonius' Optics," 48-49.

He leaves these questions open, and actually, raises the possibility which seems most likely, that Aguilon's theory was essentially a derivation from older sources.[270] However, the circumstantial evidence assembled by Parkhurst has been very quickly added to the body of assumptions about Rubens as a colour theorist, and gradually, and seemingly inevitably, the artist's reputation has once again been changed.

Parkhurst himself later wrote, in an article about the triad of modern primaries, in the context of a painting by Anthony van Dyck:

> To begin with van Dyck, we believe he was instructed in the serviceability of a red-yellow-blue base for painting by his teacher, Rubens, who reportedly prepared a manuscript on color, now lost. We have a good knowledge of what it contained, nonetheless, for Rubens not only appears to have advised a scientist friend of his in Antwerp about color theories, but this friend, whose name was François d'Aguilon, a Jesuit college rector, inserted a chapter on color in a book he wrote about vision, and published in 1613, which presented a red-yellow-blue color mixing system. Rubens also painted a picture at the same time to prove the theory, his *Juno and Argus* (1611) now in the Wallraff-Richartz Museum, Cologne, a wholly optical picture referring, like d'Aguilon's book, to direct vision."
>
> Parkhurst then goes on to write,
>
> "what the great Rubens put forward as a convenient and scientific studio practice, subscribed to by his scientific friend, d'Aguilon, was carried on by his pupil, van Dyck....[271]

Similarly, Parkhurst, in an article discussing the colour theory of Anselm de Boodt, made another reference to the Aguilon three-colour theory, writing that it "was included as a chapter on color in François d'Aguilon's volume on optics, discussed by me elsewhere,

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[270] Julius S. Held is of the same opinion: Julius S. Held, "Rubens and Aguilonius," 258.

[271] Charles Parkhurst, "Red-Yellow-Blue," 33-39, 36-37.

which was also closely connected with the art of painting and appears to have stemmed directly from the great Antwerp artist, Peter Paul Rubens."[272]

In the same vein, in a fourth article, this one an examination of the colour theory of Louis Savot, Parkhurst again refers to Rubens and Aguilon:

> At about this same moment Antwerp's great artist, Peter Paul Rubens, was studying colour and although a manuscript he is said to have written on the subject has vanished, its contents are doubtless repeated or reflected in a chapter on color inserted in a book on optics completed in 1611 by Rubens' friend, François d'Aguilon, and published at Antwerp by the Plantin Press in 1613 ....

He goes on to outline the theory and states again that Rubens painted the *Juno and Argus* as its demonstration. He then continues:

> D'Aguilon made a great graphic contribution in his diagram of this three-color system .... D'Aguilon's graphic presentation (did Rubens devise it, too?) seems to have been the first printed and published color diagram and is repeated throughout the 17th century in other works.[273]

Very quickly these notions were accepted, and in fact, have become, through repetition, something of an art historical commonplace! Ten years after the Parkhurst article on Aguilon and Rubens, Michael Jaffé amplified the same idea. He claimed that Rubens "didactically" applied the colours in the diagram to a painting of the *Annunciation* (Kunsthistorisches Museum, Vienna). This work was painted for the Oratory of the Society of Literati at the Antwerp *Maison Professe* very soon after Rubens' return from Italy. At the same time, Jaffé referred to the *Juno and Argus* as " a monumental illustration of the painter's agreement with Aguilon's colour theory."[274]

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[272] Charles Parkhurst, "A Color Theory from Prague," 3-10, 8-9.

[273] Charles Parkhurst, "Louis Savot's *nova-antiqua* Color Theory, 1609," 242-247, 244.

[274] Michael Jaffé, "Rubens and Optics: Some Fresh Evidence," *Journal of the Warburg and Courtauld Institutes,* 34, 1971, 362-366, 365.

Jaffé, when he identifies the colours in the work, seems hard pressed to make his point about the *Annunciation's* correspondence to the colours in the diagram; a problem which Julius S. Held has pointed out. Held also noted that the early date of the work makes the direct connection with the Aguilon theory somewhat suspect.[275]

Lorenz Dittmann, in his analysis of the Vienna picture, has noted that it is the secondary colours, rather than the primaries, which predominate, and that even these are not equally represented. Similarly, Dittmann argues that the colours in the *Juno and Argus* are also unevenly displayed; for him the contrasts of the chiaroscuro are more pronounced and evident.[276]

Most references, either passing or detailed, to Rubens and colour now link his name with Aguilon's. Implicit in the references are the assumptions that Rubens had a colour theory, that it was a three-colour theory, and that the Aguilon theory is his, or very much like his. Further, it is often assumed that Rubens' own writings on colour - now lost - parallel or are identical with those writings published by Aguilon.[277]

That Rubens' art is based upon sound principles is beyond dispute. However, that we can compare the works to any system of colours or to any theory lies in the nature of the colours themselves, not in the dictates of a theory. Examinations of Rubens' paintings cannot help but to reveal a synchronicity with a theory if it is sought after; such is the nature of colour and pigment. Similarly, any painting by Rubens will also stray from any theory and reveal profound differences. The pictures should not be taken as illustrations of a

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[275] Julius S. Held, "Rubens and Aguilonius: New Points of Contact," 257-264, 258.

[276] Lorenz Dittmann, "Versuch über die Farbe bei Rubens," 41-42.

[277] See, for example, Martin Kemp, "Yellow, Red and Blue. The Limits of Colour Science in painting, 1400-1730," in Allan Ellenius, ed., *The Natural Sciences and the Arts (Acta Universitatis Upsaliensis,* 22) , Uppsala, 1985, 98-105, 102; or, Thomas Lersch, "Farbenlehre," col. 202.

theory nor as a means of teaching it. To pursue this line of thought cannot fail to result in a closed and self-referential series of arguments and proofs.

The Written Evidence

The most leading and at the same time most tantalizing evidence that Rubens did have cogent thoughts on colour that might be called a theory is to be found in his own writings, or perhaps more accurately, in others' references and reports of them.

We know that Rubens, during his life kept a series of notebooks. These writings are usually referred to as a single entity, the *Pocketbook*. It appears to have been a compendium of Rubens' ideas, theoretical and otherwise. It is lost in its original form but seems to have come down to us in transcriptions and fragments.[278]

The book has at various times been described in suggestive terms. Bellori wrote of it as " *un libro di sua mano, in cui si contengono osservazioni di Ottica, Simmetria, Proporzioni, Anatomia, Architettura, ed una ricerca de' principali affetti, ed azioni cavati da descrizioni di poeti, con le dimostrazzioni de' pittori.*[279] The reference to optics is, of course, immediately interesting in this context.

Jaffé has given a succinct history of the *Pocketbook*.[280] He surmises that the book was begun sometime after Rubens left Antwerp for Italy in 1600; a major part of it was

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[278] For a full discussion see: Michael Jaffé, *Van Dyck's Antwerp Sketchbook* , London, 1966. See also, Anne-Marie S. Logan, "Leonardo, Poussin, Rubens and the Ms. De Ganay," *Essays in honour of Egbert Haverkamp-Begemann* , Doornspijk, 1983, 142-147.

[279] Giovanni Pietro Bellori, *Le Vite de'pittori, scultori et architetti moderni, ...* ,Rome, 1672, 254, cited in Michael Jaffé, *Van Dyck's Antwerp Sketchbook* , 16.

[280] Michael Jaffé, *Van Dyck's Antwerp Sketchbook* , 301-302.

devoted to material which he studied in Rome. It seems, however, that the manuscript was in use until 1635 or thereabouts.

The collection of notes, and other graphic materials, probably remained intact and with the family until August 1657 when it and other materials left in the estate were dispersed through sales. The materials had been kept by the family in accordance with Rubens' wishes; the artist wanted any potential artist in the family to benefit from the work, thus it was kept until it became clear that there was not going to be a successor.

Roger de Piles obtained the *Pocketbook* and other materials, including a treatise "sur les lumières et les ombres," sometime before 1708, probably from Albert Rubens, the painter's eldest son. De Piles published a transcription of a portion of it, the essay on imitation discussed earlier, in his *Cours de Peinture par Principes*. He had had first hand knowledge of this since 1676.[281]

Sometime before 1709, Claude Bourdaloue acquired the book and presumably some of the other material.[282] Andre-Charles Boulle was the next to be in possession of the material. While it was in his hands it was substantially destroyed in a disastrous fire in his studios at the Louvre. The essay on lights and shadows was presumably consumed by the flames as well, although a version entitled *De Lumine et Colore* was last recorded in the hands of Rubens' descendant, Van Parys, around 1790.[283]

John Gage has proposed that its existence until the nineteenth century contributed to Rubens' reputation as a theorist. The idea is plausible; however, we do not have any

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[281] John Gage, *Colour in Turner*, 222, n. 10.

[282] B. Teyssèdre, *Roger de Piles et les débats sur le coloris au siècle de Louis XIV*, Paris, 1965, 218-219.

[283] J-F-L Merimée, *De la Peinture a l'Huile*, Paris, 1830, 270, cited in John Gage, *Colour in Turner*, 222, n. 10.

substantial written discussions of, or indeed, references to, the material that would lead us to believe that it was widely known and, consequently, influential.

Significantly, Roger de Piles, the one-time owner of the written remains is silent about the manuscript. This is particularly curious if we consider De Piles' vested interest in anything colour theoretical and his championing of Rubens in the academic debates.

De Piles, of course, wrote at some length about Rubens' painting and in so doing discussed a prime concern of his: chiaroscuro or *clair obscur* .[284] He writes:

> *Tout ce qui depend du coloris est admirable dans Rubens, il a porté la science du clair-obscur plus loin qu'aucun Peintre* ..., and further, *(Rubens) rassembloit ingénieusement ses objets à la manière d'une Grappe de Raisin, dont les grains éclaires ne font tous ensemble qu'une masse de lumière, & dont ceux qui sont dans l'ombre ne font qu'une masse d'obscurité, ensorte que tous ces grains ne faisent qu'un seul objet, sont embrassez par les yeux sans distraction, & peuvent etre en meme tems distinguez sans confusion.*

Imdahl points out that this analogy is fundamental to de Piles' view of Rubens' picture construction.[285] Rubens saw the composition as a totality; the chiaroscuro, the play of lights and darks, was not limited to the formation of figures, figure groups nor objects; it was first and foremost a generalized system of contrasts in the composition. The pictorial organization - its chiaroscuro - has the effect of allowing the lights and darks to have a colouristic effect on the actual colouring in the overall pictorial design; in short *coloris* encompasses *clair-obscur* ; they form a unity.

Further, Imdahl observes that de Piles made distinctions and differentiations in the colours and colouristic effects: De Piles writes, *Il y a une harmonie & une dissonance dans*

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[284] Roger de Piles, *Abrégé de la Vie* ... , Paris, 1699, 403, 405. For a discussion of this, see, Max Imdahl, *Farbe,* 55-65.

[285] Roger de Piles, *Abrégé de la Vie* ... , 405, as cited in Max Imdahl, *Farbe,* 59-60.

les especes de Couleurs, comme il y en a dans les tons de lumière, de même que dans une Composition de Musique .... [286]

According to de Piles, colours can harmonize in a number of ways; through *participation,* through *sympathie* , and through *antipathie* or *opposition* . Participatory harmony resulted when *plusiers couleurs participent d'une seule dont il entre quelque chose dans chacune* . In chiaroscuro, this is apparent *dans les groupes de lumières ou d'ombres dans lesquelles les couleurs, quelques ennemies qu'elles soient, sont réconciliées.* In sympathetic harmony, the colours do not destroy each other and *leur mélange fait une composition agréable qui tient toujours de leurs qualités* . The appropriate colours for this are white, lake, blue and green; from these an infinity of others, all of which are sympathetic, can be mixed.Antipathetic harmony exists when inharmonious colours participate mutually with a third which then links them.

> *Pour l'opposition des couleurs, elle ne doit estre mise en usage qu'avec grande discretion, en les liant par quelque couleur tierce qui seroit amie de l'une & de l'autre, & en l'employant dans les endroits seulement où l'on veut attirer la veuë, comme sur le héros du tableau, ou sur quelqu'autre que l'on veut faire remarquer, ensorte néanmoins qu'elles n'empêchent pas l'accord du tout-ensemble, non plus que les dessus dans la musique.*[287]

For de Piles, Rubens was a master at establishing these types of harmonies.

Implicit in de Piles' discussion is the possibility of establishing a system that could underlie the use of colour, i.e. a theory. De Piles distinguishes the expressive qualities of the various colours (pigments):

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[286] Roger de Piles, *Abrégé de la Vie ...*, 51, as cited in Max Imdahl, *Farbe,* 61. Imdahl's conclusions on the same page.

[287] Roger de Piles, *Abrégé de la Vie ...*, 155, as cited in Max Imdahl, *Farbe,* 61.

L'Ocre de Rut est une Couleur des plus pesantes. L'Ocre-jaune ne l'est pas tant, parce qu'elle est plus claire. & Le Massicot est fort léger, parceque c'est un Jaune très-clair& qui approche fort du Blanc. L'Outremer, ou l'Azur, est une Couleur fort légère & fort douce. Le Vermillon est entièrement opposé à l'Outremer. La Laque est un milieu entre L'Outremer & le Vermillon, encore est-elle plus douce que rude. Le Brun-rouge est de plus terrestres et des plus sensibles ....[288]

Imdahl notes that it is not really possible to recognize an absolute order or a hierarchy of colours in de Piles' theory, particulariy not the kind of order or arrangement founded on notions of complementarity that nineteenth- century theorists believed they had found.[289]

In addition, de Piles assumed that there were not the three (or five) basic or primary colours as outlined by Aguilon, but rather four: *Jaune, Rouge de feu, Cramoisi, Bleu* . These, with the addition of *Orange, Vert,* and *Violet* made for a seven step arrangement. Inclusion of *Pourpre, Vert de mer, Vert jaunâtre, Jaune doré* and *Rouge* resulted in a twelve hue diagram.[290] In this diagram, the complementary colours do oppose each other, but de Piles does not mention the fact in his discussions of harmony.

It seems that de Piles' notions of harmonious colouring and mixing are more intuitive than strictly theoretical even if he establishes seemingly sound criteria for mixing and placement: *participation, sympathie* and *antipathie* . For de Piles to see all of these admirably employed in Rubens' work, whether they are or not, is again probably more the

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[288] *Oeuvres diverses de M. de Piles* , 5 vol., ed. H. A. Jombert , Amsterdam, Leipzig, Paris, 1977, vol. 5, 212, as cited in Max Imdahl, *Farbe,* 61-62.

[289] Max Imdahl, *Farbe,* 62.

[290] De Piles arranged the colours in a circle. Newton was probably the first to do so, but his treatise on optics was first published in 1704, then in 1727. The dating is suggestive; de Piles was probably influenced by Newton's lectures from 1672. For discussion and references see, Max Imdahl, *Farbe,* 62, 167, n. 115.

product of colouring *per se* , rather than Rubens' conscious adherence to theoretical principles.

To return to our main point, the fact that de Piles makes no specific reference to Rubens' writings on colour theory is significant and leads one to wonder whether or not there was such specifically colour theoretical material in the manuscripts by Rubens that de Piles acquired.

We are assured that there was a manuscript dealing with colour by a number of written sources. These are in the remains of the correspondence of Rubens' friend, Nicolas Claude Fabri de Peiresc; some of these letters were from the artist himself.

Nicolas Fabri de Peiresc

Peiresc, born on 1 December, 1580, was the son of Raynaud de Fabri, sieur de Callas and *conseiller* in the Parlement of Provence, and Marguerite de Bompar de Magnan. The family was originally from Pisa but had lived and thrived in Provence for many years. Peiresc took his name from an estate in his mother's possession: the town of Peiresc in the Alpes de Provence.[291] Peiresc was schooled successively at Aix, Avignon and Tournon. It was at the latter that his interest in astronomy was apparently awakened.

In 1599 went to Padua where he met the antiquarian and numismatist Giovanni Vincenzo Pinelli and Galileo. His stay was relatively short, in 1600 he traveled through Italy, Switzerland and France. He settled finally in Montpelier where he began his study of the law under the tutelage of Julius Pacius. Pinelli and Pacius both seem to have had a lasting effect on Peiresc; they stimulated his interest in the antique, art and science.

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[291] Biographical information on Peiresc has been gathered in: Harcourt Brown, "Peiresc, Nicolas Claude Fabri de," *Dictionary of Scientific Biography*, New York, 1970, 10, 488-492.

In 1604, having obtained his law degree, Peiresc returned to Aix and took over his uncles' seat in the Parlement. In 1605 he went to Paris as the secretary to the Parlement's president, Guillaume du Vair. In 1606 he was part of a diplomatic mission to England from which he returned via the Netherlands. In each of the places he visited, he sought out both professionals and amateurs in the arts and sciences.

Sometime in 1610 Peiresc read Galileo's *Sidereus nuncius* and learned of the latter's application of the telescope in astronomy. He had access to a telescope because his patron, du Vair, had already acquired one. With it, and in the company of the astronomer, Joseph Gaultier, Peiresc became one of the first two men in France to see the four satellites of Jupiter. Astronomy was to be an abiding interest for the rest of his life.

In 1616, he returned to Paris, again in the service of du Vair, and began what was to be a seven year sojourn. While in Paris, he met the Dupuy brothers and through them many of the intellectuals, scientists and artists of the day, including Mersenne and Rubens. Du Vair died in 1621 but Peiresc stayed on for two years. He returned to Provence for the last time in 1623.

He continued his astronomical investigations, but was not limited to these. Numerous other personal interests filled his life. He was an avid collector of diverse scientific and historical material: rocks, crystals, coins and medals. He cultivated one of the largest gardens in France and filled it with exotic plants. He became interested in anatomy and sponsored dissections in his house (1627). He was further inspired in these investigations by the publication of Harvey's *De motu cordis* , which prompted him to devote some time and thought to the mechanisms of blood circulation.

His anatomical studies in conjunction with his interest in lenses and concave mirrors led in 1634 to speculations about vision and the study of the structure and function of the eye. Peiresc carried out dissections on animal eyes: a shark, a dolphin, a tuna, ox,

sheep, owl and eagle. He was also careful to observe his own perceptions, noting, as mentioned above, the play of colours as well as the persistance of afterimages. These records are only available in fragmentary form; they were not published.

Peiresc's health declined in early 1637. He died on 24 June of that year.

Peiresc was a product of the Renaissance. He was an amateur and a dilettante in the best senses of the terms. He was practical; he did not withdraw into bookish speculations, but rather seemed inclined to draw on the expertise of the skilful. His erudition, his curiosity, and his optimism about the possibility of the advancement of human learning, are the hallmarks of his life. Perhaps this spontaneous enthusiasm for intellectual pursuits and his practicality inspired him to ask Rubens, a professional whose work demanded an intimate knowledge of the workings of colour and pigment, about that subject at a time when it had piqued his interest. Rubens, somewhat hesitantly, complied with his friend's request. He seems to have written down some thoughts on colour. However, in essence, that is the extent of our knowledge. We do not know what Rubens wrote, we do not know how comprehensive it was, and we certainly do not know whether it relates in any way to the ideas published by Aguilon.

The Evidence and the Correspondence

Peiresc, in a letter to Jacques Dupuy dating from 29 May, 1635, describes coloured images effects on his eyes; they "transform themselves successively from one colour to another in a certain admirable order." In the same letter he goes on to write that Rubens had begun a "discourse on colours."[292]

On 1 June, 1635, Luillier wrote to Peiresc at Aix: *j'ai veu dans la lettre que vous escrivez a Mr. de Saint-Sauveur de l'esperance que vous avez d'avoir un discours des*

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[292] *C.D.R.* , 6, 105; Magurn, Letter 237, 505, n. 5.

couleurs dresse par M. Rubens. He continues with the statement that a discourse on colours by Rubens would be like Brutus writing a discourse on virtue.[293]

Rubens, for his part, writes in a letter from 16 August, 1635 to Peiresc, that , "The strong impressions which visible objects make upon your eyes seem to me more curious with regard to the lines and contours of forms than to colours, and less so for colours resembling a rainbow than if they are the proper colours of the objects. But I am not as versed in this subject as you think, and do not consider my observations worthy of being put into writing."[294]

But Rubens seems to have been persuaded to put his experiences on paper. A letter by Peiresc dated 5 February, 1636 mentions that Rubens has a discourse on colours ready to be sent to him.[295] In a letter of 16 March, 1636, Rubens asks of Peiresc, as an afterthought: "I hope you will already have received my essay (*conato*) on the subject of colours."[296]

As mentioned above, the manuscript in question has been lost, and there are no other references to the essay nor is there any other indication of the exact nature of Rubens' thoughts on colour in the surviving literary material in the Peiresc legacy. If we recall Rubens' hesitation about commiting his thoughts on colour to paper - we think of the letter to Peiresc of 16 August, 1635 - we might conclude that the artist would have been hard pressed to write about anything new by way of the theoretical, and would therefore, have been much more likely to have discussed his use of colour in practical terms. Indeed, the

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[293] *C.D.R.* , 6, 112; Magurn, Letter 237, 505, n. 5.

[294] Magurn, Letter 237, 401.

[295] Magurn, Letter 237, 505-506, n. 5.

[296] Magurn, Letter 238, 402-404; Hans Georg Evers, *Peter Paul Rubens,* 434, 507, n. 446.

lack of any subsequent allusion to Rubens' thoughts on colour by Peiresc could also be taken as significant and suggestive. The latter pursued his scientific interests with sophistication and rigor, in fact the correspondence that contains references to Rubens and colour date to a period in Peiresc's career when he was particularly interested in vision and optics. The subsequent silence surrounding the Rubens essay could be taken as indicative of disappointment in the artist's efforts. Perhaps they were too practical and descriptive in nature, instead of being filled with innovative theoretical insights. In any event, what circumstantial evidence we do have about Rubens and colour theory comes long after the artist's contributions to Aguilon's book and long after he painted the two pictures discussed earlier.

CHAPTER VIII: CONCLUSION

This essay in understanding any associations that Peter Paul Rubens may have had with any colour theories, contemporary or otherwise, is predicated on the assumption that our present day view of these relationships, if they do exist, has been obscured over time.

A number of complicating factors have conjoined to dim our perceptions further. Not the least of these is the issue - for such we may call it - of the artist's reputation. I have tried in some measure to show how it, like all reputations, was and continues to be subject to change, usually, when that change can in some way further the ends of those responsible, even if they mean well, as I believe was the case with Roger de Piles.

What is astonishing is the ease with which a reputation is metamorphosed or even compromised by what seems a thoughtless or even whimsical criticism. We need only recall the enduring negative judgments on Rubens' qualities as a draughtsman, started by Sandrart, voiced even by his champions like de Piles, and again reiterated much later by another admirer, Eugène Delacroix. These particular criticisms, to my view, were levelled in the face of all visual evidence to the contrary. It is often difficult to think of questioning previously received appraisals.

And yet, revised insights, new found knowledge, or newly formulated tenets dictate, in a subtle, and oft times insidious way, the manner in which all previously held thoughts or beliefs come to be considered, be they with condescension or with admiration. A complication arises when an admired reputation, erected on the shifting sands of taste, threatens to make its owner seem somehow antiquated and consequently diminished. Revision, even radical change, inspired by the best of intentions, is seen as desirable, or indeed, necessary. We need only think of the minor, yet telling, example of the physical changes made to the painting of *Juno and Argus* to make it more acceptable to the neo-

classical tastes of late eighteenth-century France. Or, we can recall the firmly held nineteenth-century belief that Rubens' ideas about colour were squarely based on a set of three colour primaries; those which we now take for granted: red, yellow and blue. Or, even more telling, we may remind ourselves of the unquestioned faith in the idea that Rubens did in fact have a colour theory, without, as I have shown, any substantial evidence for such an idea.

Apelles, and his reputation, come to mind. All we know of his life and works can be traced, ultimately, to the writings of Pliny. We recall that we have no document, no art work; indeed, we have no artifact of any kind, nor for that matter did Pliny when he wrote. And yet, Pliny, vested with the authority of the Antique by later readers, somehow made this spectral personality substantial, paradigmatic, and as a consequence, influential beyond measure.

Apelles and his chronicle were, as we have seen, a model and an exalted metaphor for Peter Paul Rubens and his life. Much like other artists both before and since his time, Rubens was compared to Apelles; in his case, however, the comparison was justified. Both were brilliant artists; both were enormously successful in all aspects of their lives; both enjoyed the patronage of kings and emperors; and both held reputations as thinkers and learned men.

Pliny was at pains to show how Apelles' theoretical considerations about colours and their mixture manifested themselves in his studio practice. He wrote of Apelles' use of four basic austere colours and of a dark varnish used to tone down those colours that were florid. We have seen how this account of painting practice was prompted not so much by theoretical concerns as perhaps by aesthetic ones. Pliny, in accord with prevailing taste, preferred simple subdued colours; these were seen as more appropriate than those he considered too bright or even garish.

In much the same way, Rubens, too, was thought to have a theoretical basis for his painting methods. He also was seen to have built his colour compositions on a set of basic colours - red, yellow and blue, augmented by black and white - which he mixed in three distinct ways. As with Apelles, assumptions about his use of colours, and his theories were dictated, at times, by aesthetic concerns rather than theoretical ones. We need only recall Roger de Piles and the academic debates as an example.

It has been said that the idea that Rubens did indeed have a colour theory is given some measure of credibility by the fact that, unlike Apelles, we do have some circumstantial documentary evidence for it in the form of letters and other written allusions to writings about colour. Scholars may be inclined to think of these lost writings as a theory because Rubens' brief theoretical essay on *Imitation* has survived. However, it is wise to recall that this essay was only published posthumously, almost a century after it was composed, when Roger de Piles rescued it from oblivion, and that Rubens himself made no attempt during his lifetime to see it into print. Moreover, we remind ourselves once again , that in 1635 - a quarter of a century after his creation of the *Juno and Argus* and the illustrations for Aguilonius' *Opticorum libri sex* . . . - Rubens wrote to Peiresc that he (Rubens) was "not as versed in this subject," that is colour, as his correspondent thought . It seems highly unlikely that the artist would not remember a theory that he had devised twenty-five years earlier, and further, if he had actually come up with one, as has been suggested, it is almost beyond understanding that there are no references of substance to what would have been revolutionary insights during the two centuries following the painter's death.

I have pointed out that we often assume that theoretical writings are, by definition, innovative; however, our review of the artist's essay on the use of antique sculpture is suggestive. It reveals that, in this instance, Rubens' thinking offers nothing that is

fundamentally new, but rather, that the artist gave expression to ideas which are fully in the mainstream of the artistic thought of his time.

It is the thought of Rubens as innovator in the field of colour theory that has proved so exciting to art historians. The idea was prompted by Rubens' association with François d'Aguilon, the author of a book on optics that contained a short section on colour. For all its brevity, Aguilon's chapter on colour is innovative, though not uniquely so; it is one of a small number of essays that propose a set of three basic colours - red, yellow and blue - that were published in serendipitous fashion at about the same time.

As we know, Rubens was familiar with the book. His designs for the illustrations prove that he was not only aware of, but understood, its contents. This fact, along with internal evidence in the book, has been interpreted at face value and has prompted researchers to assume that the artist contributed to the text, directly or indirectly, as well. The evidence for this is at best circumstantial and it can be more plausibly argued that Rubens' involvement with the project came after the manuscript had been completed and was at the Plantin-Moretus press, at which time his friend Balthasar Moretus asked him to provide a title-page and some illustrations.

As we have seen, the evolution of colour theories is a vexed matter; there are issues that remain unresolved to this day. It is ironic that the reputations of Apelles and Rubens should be further linked by a strange episode in the history of colour studies. Pliny's account of Apelles' limited palette, described in colour terms that proved to be impossible to identify with any accuracy (remember, colour can only be experienced ostensively) by later readers, instigated a philological debate and resulted in a mistranslation - a mistake - that helped, perhaps, to establish the primacy of red, yellow and blue as basic colours for Aguilon and a limited number of his contemporaries.

The recognition of the three fundamental or primary colours is, for us, an event of crucial importance. In retrospect, it seems to have entered the literature, Aguilon's book for instance, relatively unobtrusively. It was not announced as a radical new principle, but rather as a description, or a formula, that corresponded in large measure to long established practices of colour mixing. Aguilon himself is rather prosaic in his account, and at a certain point, as we have seen, says that painters know more of this than he. To pick another example of the casual acceptance of the practice, we can perhaps look to Robert Boyle, writing half a century later; he notes that painters used red, yellow and blue as their "primitive" or "simple" colours, in conjunction with black and white.[297] In a similar way, J. Scheffer, the great Swedish scholar, writes matter- of- factly in his book on painting practice that, "the simple colours are three in number: red, blue and yellow. And they are associated together with light, i.e. white, and shadow, i.e. black."[298]

Implicit in these references to the painter's primaries is a general failure. Colour science, up to the time of Rubens and beyond, did not and does not really provide the painter with an explanation of why his pigments behaved as they did. It also does not explain in any adequate way the relationships between pigments and the effects of colour and light as they were seen, and sought after for imitation, in nature.

The primary colours did not need elucidation by a theory because they, and the others, had always been used for mixing in studio practice. To elevate the known behaviour of a limited number of pigments to the heights of theory would not have interested painters for the simple reason that they already knew what would happen. They

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[297] Robert Boyle, *Experiments and Considerations Touching Colours,* London, 1664, 219-220.

[298] J. Scheffer, *De Graphice id est de arte pingendi,* Nuremberg, 1669, 44, 158ff. See A. Ellenius, *De Arte Pingendi* , 180-183.

simply did not know how or why; for an explanation, artists had to wait until the nineteenth century.

If we accept that colour theory, as outlined by Aguilon, was in essence a description of all studio practice, not just that of Rubens, and not, as has been implied, a prescription for painting, even though Aguilon is careful to distinguish between abstract colours and coloured objects, then it should come as no surprise that close examinations of Rubens' works reveal, at times, a congruency with the theory. It could not be otherwise; pigments and paint behave in a predetermined way.

Peter Paul Rubens was a great artist and a master craftsman. These two qualities, now often separated, were joined in one personality. His craft and his artistic will conspired to create his masterpieces. To speak of a colour theory, to look for it in the works, is to miss the point. For Rubens, practice and theory are inseparable.

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Illustrations

Figure 1:
The Electromagnetic Spectrum.

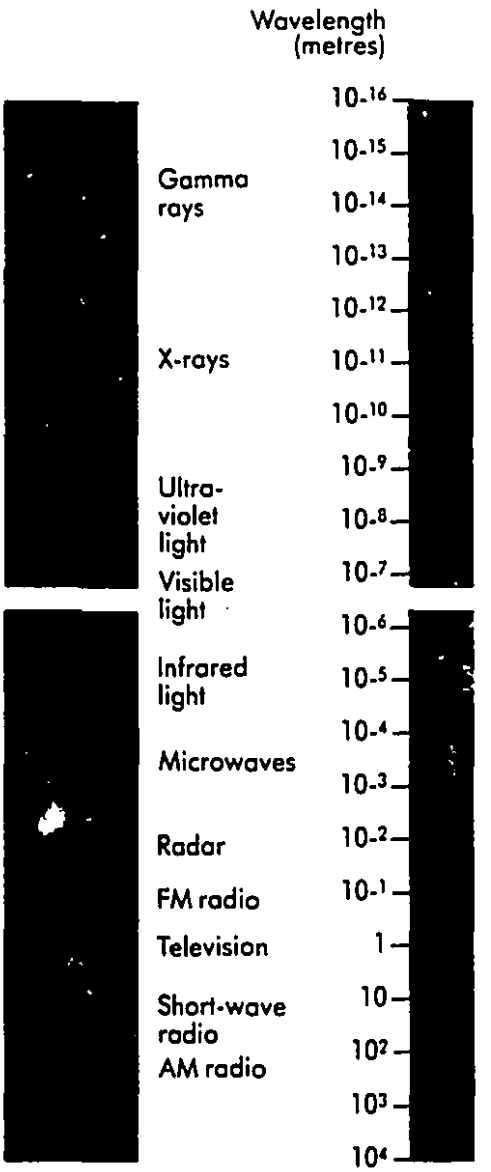


Figure 2:
The spectrum of seven "primary" colours from Isaac Newton's *Opticks* (London, 1704).

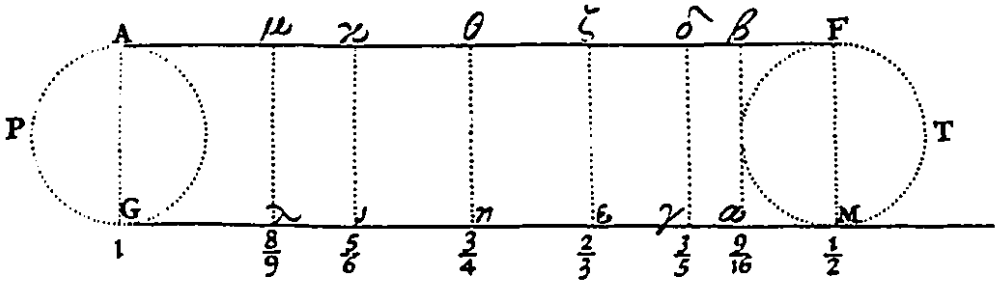


Figure 3:
Colour circle from Isaac Newton's *Opticks* (London, 1704).

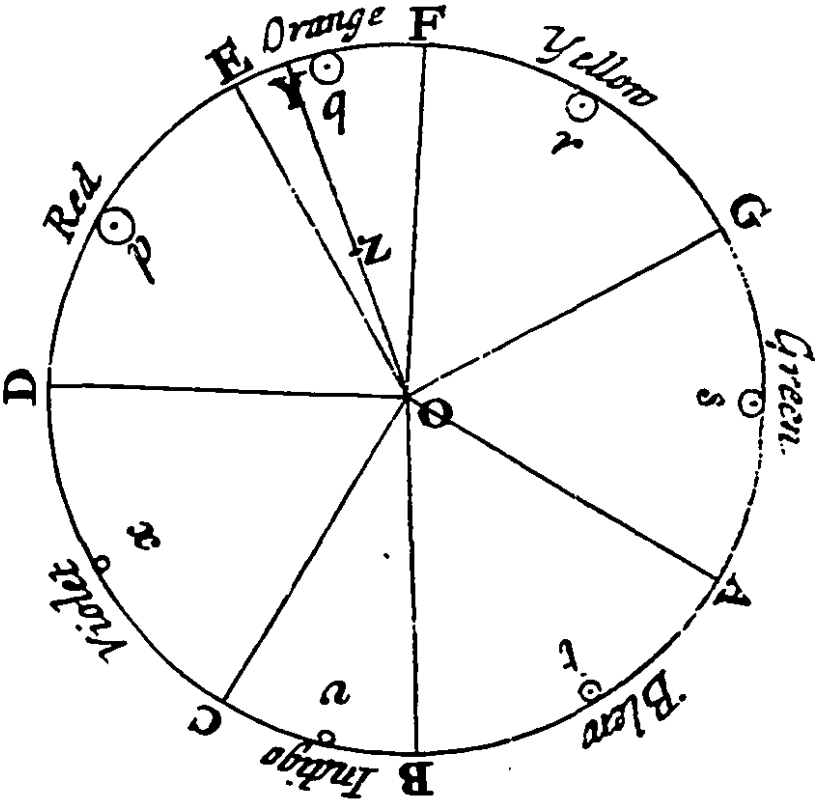
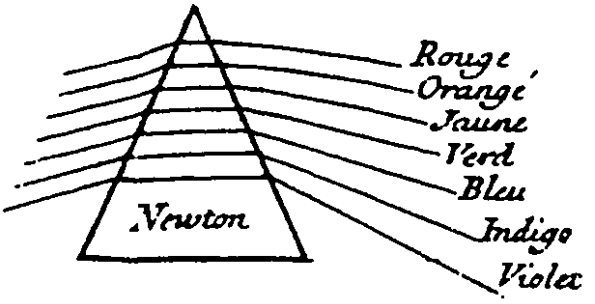


Figure 4:
The spectrum from the three primary colours from Louis Bertrand Castel's *L'Optique des couleurs* , Paris, 1740.



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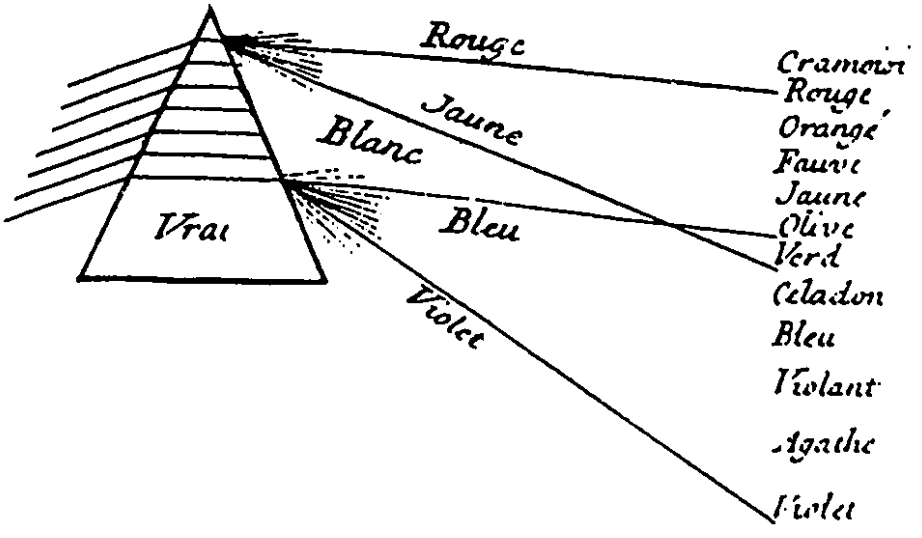

Figure 5:
Colour triangle published by Tobias Mayer in the *Göttingische Anzeigen* , II, 1758.

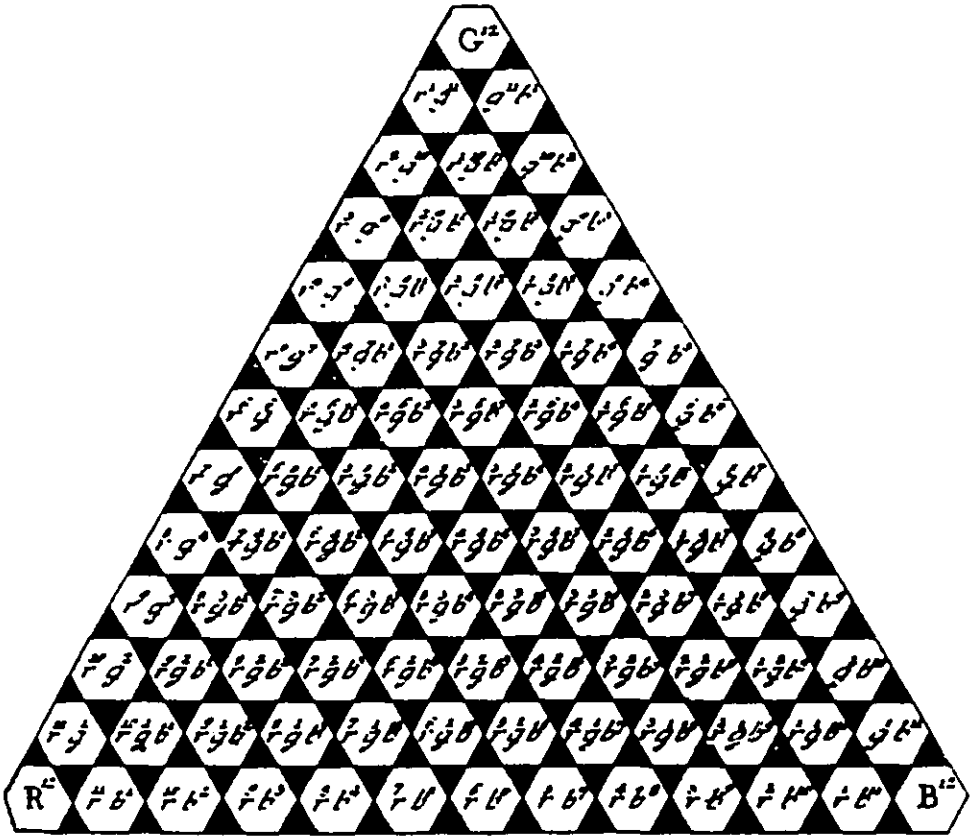

Figure 6:
Colour pyramid designed by J.H. Lambert, published in the *Farbenfibel* , Berlin, 1772.

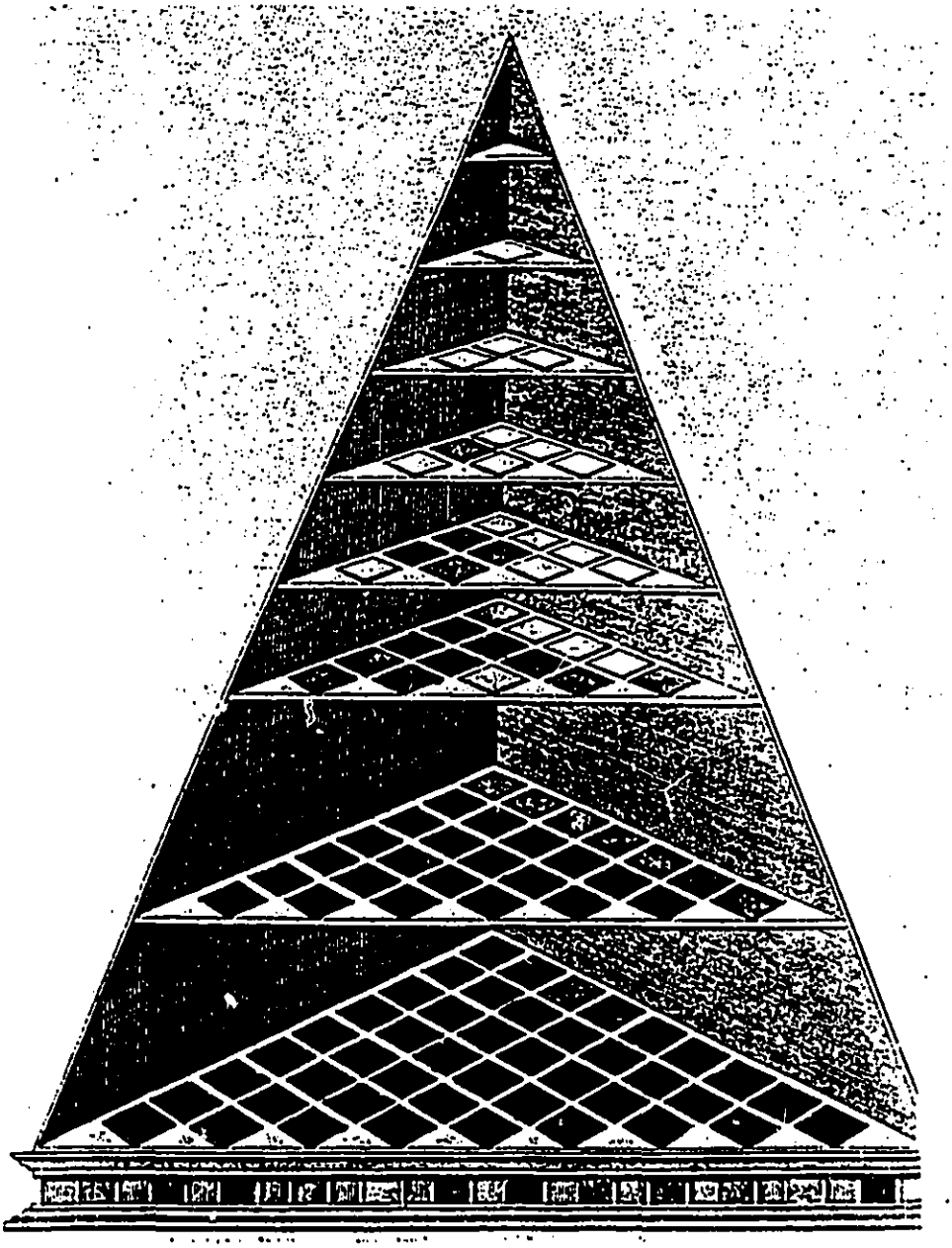

Figure 7:
Colour wheel published by Moses Harris in *The Natural System of Colours* , London, 1766?

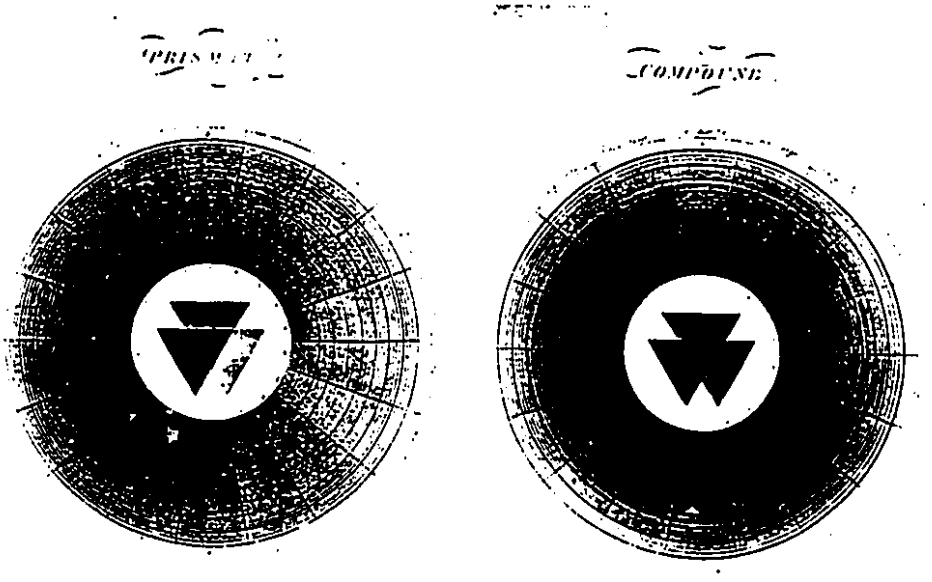

Figure 8:
Philipp Otto Runge's *Colour Sphere* , 1810.

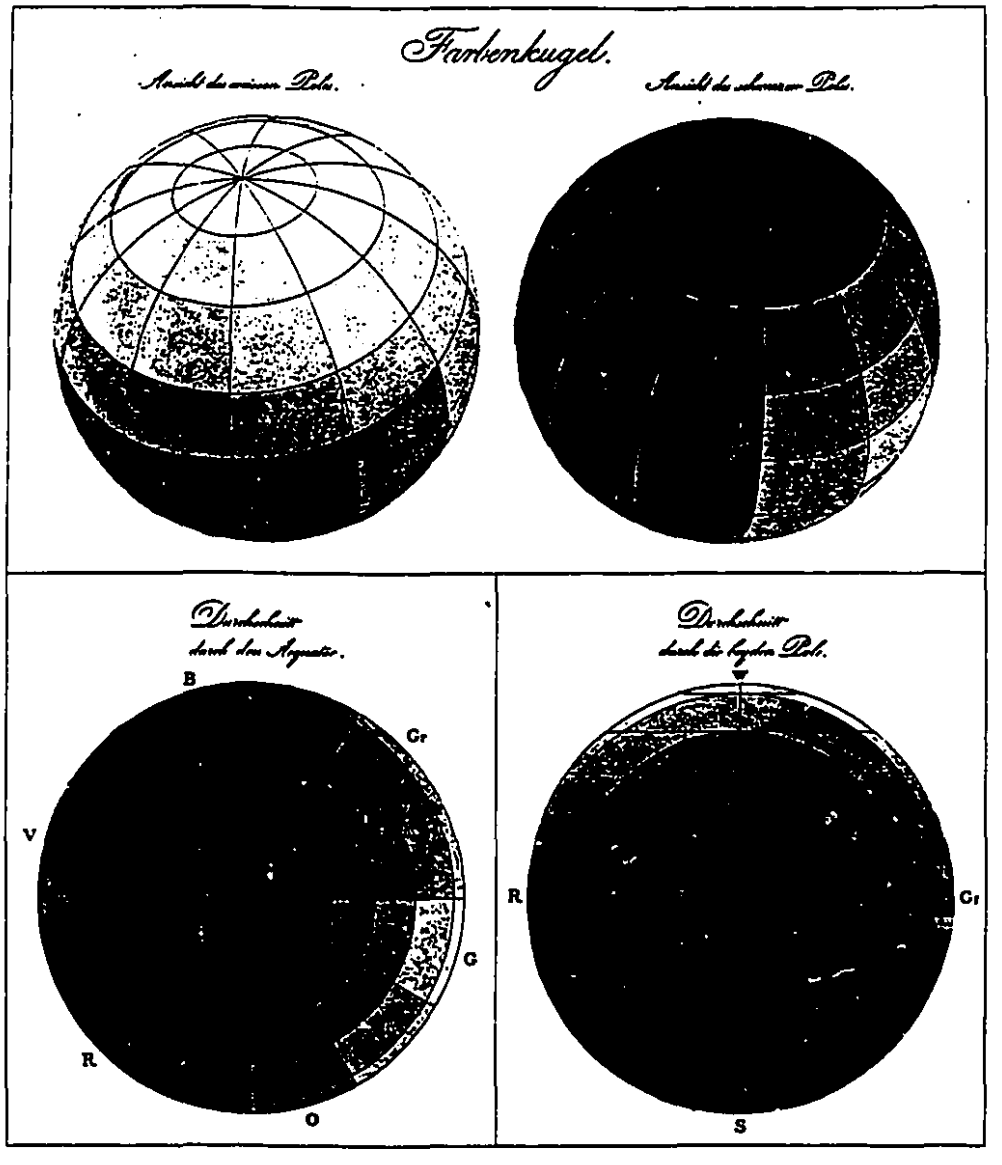

Figure 9:
Albert Munsell's colour system.

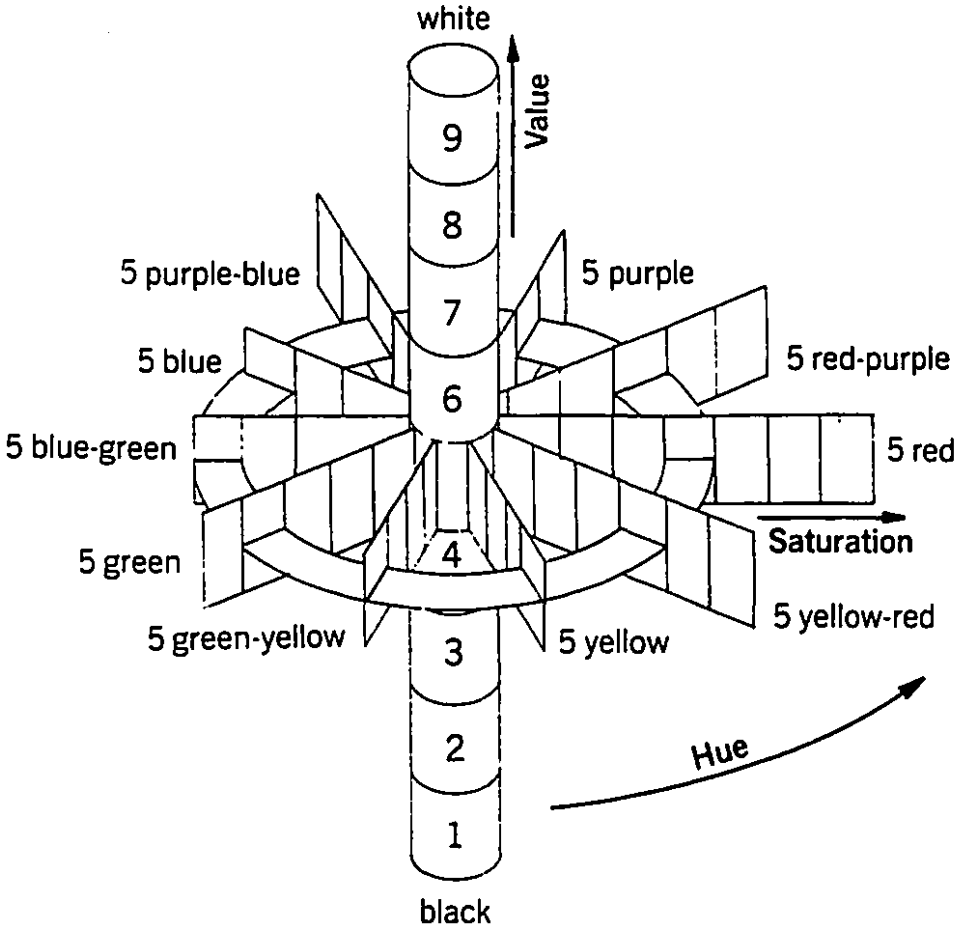

Figure 10:
Cross-section of Wilhelm Ostwald's colour solid.

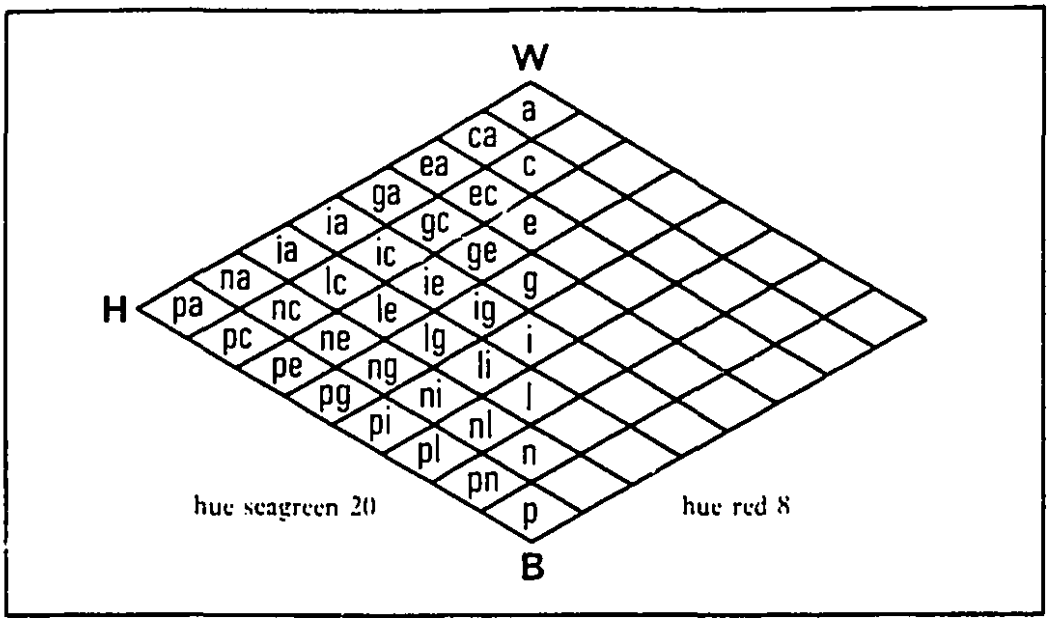

Figure 11:
Peter Paul Rubens, *The Judgement of Paris* , c.1600, London, National Gallery.

Figure 12:
Peter Paul Rubens. *Cupid Shaping His Bow* , 1614, Munich. Bayerische Staatsgemäldesammlungen.

Figure 13:
François de Aguilon's Diagram of colour Relationships.

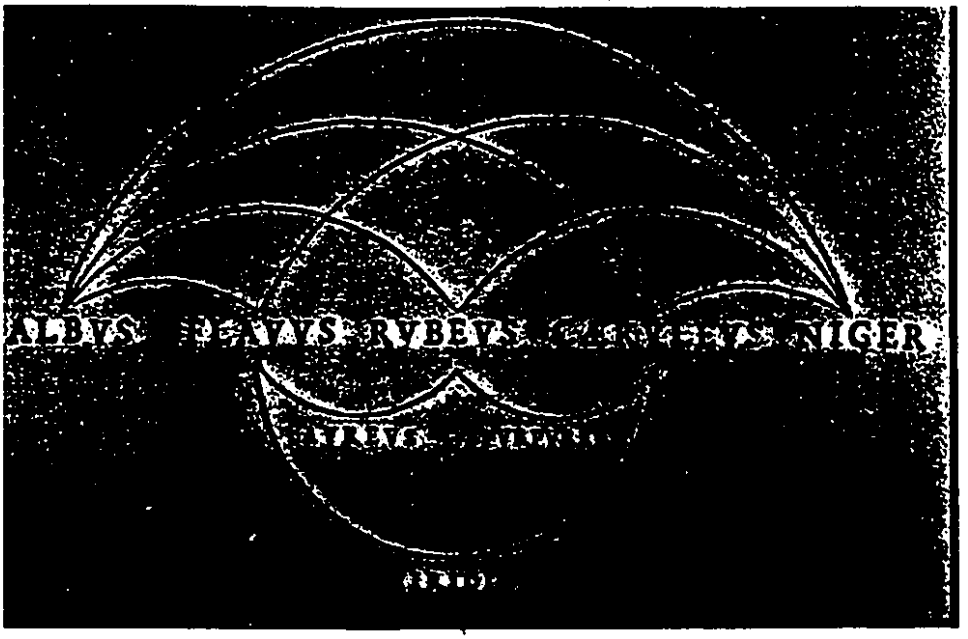

Figure 14:
T. Galle, *Title-page for Opticorum libri sex . . .*, engraving.

Figure 15:
Peter Paul Rubens, *Title-page for Opticorum libri sex . . .*, drawing, London, British Museum.

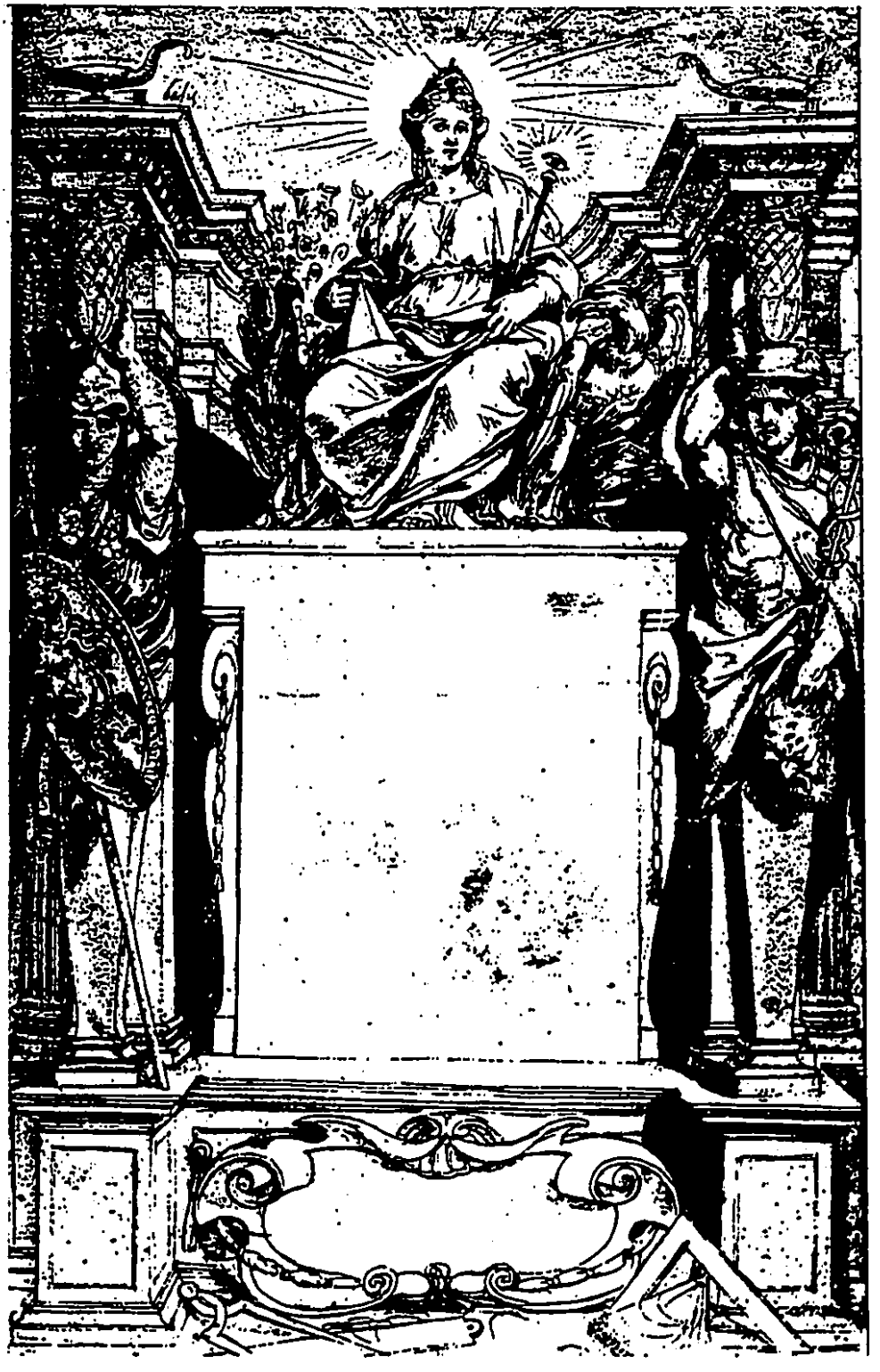

Figure 16:
Peter Paul Rubens. *Juno and Argus* , 1611, Cologne. Wallraf-Richartz Museum.

Figure 17:
Peter Paul Rubens, Jan Brueghel, *The Allegory of Sight* , 1617-18, Madrid, Prado.